

Xcel Energy

Process and Impact Evaluation of the
Process Efficiency Program—Colorado

FINAL

November 13, 2012





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EXECUTIVE SUMMARY

Xcel Energy is looking for meaningful ways to improve the elements of its demand side management (DSM) business programs, its customer-reach capabilities, and the operation efficiency of their programs so that they can successfully meet program goals and objectives. To assist Xcel Energy in this aim, Xcel Energy selected through a competitive Request for Proposals (RFP) process a third party vendor (comprised of Tetra Tech and Evergreen Economics—hereafter the “Tetra Tech team”) to conduct objective evaluations of their demand side management (DSM) business programs in Minnesota and Colorado. Furthermore, the RFP process selected a DSM business programs evaluation provider for a multi-year period in order to provide research continuity, comprehensive portfolio-level results, and best practices evaluation services.

The Colorado Process Efficiency program was evaluated in 2012. This executive summary provides an overview of the 2012 process and impact evaluation of the Process Efficiency program in Colorado.

I. 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 198,514 commercial customers and 3,802 industrial customers. These include electric only, gas only, and electric and gas customers.

Xcel Energy’s Process Efficiency program in Colorado targets large industrial customers with a minimum annual conservation potential of two GWh. Launched in 2009, the program was developed in response to requests from customers who have significant energy conservation potential but lack available resources or internal expertise. The program is designed to help customers develop and implement holistic and comprehensive energy management plans by offering technical support, business practice benchmarking, funding for detailed scoping studies, and rebates for qualifying energy conservation projects. Program marketing and outreach efforts are primarily driven through Xcel Energy account representative relationships with target customers. The program is traditionally delivered in three cyclical phases: 1) identification, 2) scoping, and 3) implementation. Each of these phases is defined and detailed in a memorandum of understanding (MOU) specific for each participant. Xcel Energy contracts a third-party provider to deliver Phase 1 of the program and provide assistance with Phase 2 scoping studies. Third-party study specialists are also used to provide customized Phase 2 scoping support for the program.

There are a few key differences between the Process Efficiency program in Colorado and its counterpart program in Minnesota. The Minnesota program currently targets customers with at least one GWh in savings potential, compared to two GWh in Colorado. Also, the Minnesota program offers incentives for both electric and natural gas saving projects, whereas the Colorado program has dropped its natural gas component due to the small number of opportunities. Another key difference is that the Minnesota program utilizes three sales engineers to assist participating customers and other Xcel Energy staff. Until recently, the Process Efficiency program team in Colorado did not include any sales engineers. Sales



engineers play a key role in scoping projects and developing implementation plans in the Minnesota program. They spend 80 to 100 percent of their time on the Process Efficiency program, and their technical expertise often makes the account managers much more comfortable interfacing with customers. The sales engineers attend most customer meetings, develop application materials, and work with the technical energy efficiency engineers (EEEs) to get needed information from customers and vendors. They often know the best contact in the customer organization (not always the customer project manager) to get operational details.

II. EVALUATION METHODOLOGY

The Tetra Tech team conducted an evaluation of the program in 2012. The process evaluation provides Xcel Energy with a thorough understanding of participating and nonparticipating industrial customer and trade ally awareness, attitudes and behaviors, and benchmarked information for similar programs offered throughout the country. The evaluation also assessed measure persistence and conducted net-to-gross research to inform net savings.

The evaluation research included five primary activities: nine Xcel Energy staff internal review interviews, eight participant surveys, six nonparticipant surveys, six qualitative trade ally interviews, and a benchmarking study of ten other utility programs including four program manager interviews.

III. SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

Based on extensive primary research with Xcel Energy program staff, program staff managing industrial programs in other territories, program participants, trade allies working with the program, and nonparticipating Xcel Energy customers, the program is operating effectively with high program attribution and delivering substantial benefits to industrial customers. Most specifically, the evaluation research indicates that the comprehensive program design is an important component of Xcel Energy's demand side management portfolio. The target segment places high value on the program technical assistance and support, which was reported to be as important as the rebate in both identifying and gaining approval for implementation of projects.

Through its first three years of implementation, the program has achieved several key successes. With its holistic design and phased delivery, the Process Efficiency program is an industry leader among programs serving industrial customers. The program has delivered high customer satisfaction, providing customers with the tools and financial assistance to help them integrate energy conservation into their core business. Although the program has fallen short of its annual goals this first three-year program cycle, it has built a robust pipeline of projects expected to be completed within the next couple of years. The program's emphasis on building long-term energy management plans and changing corporate culture should also continue to produce energy-saving projects, as the evaluation research demonstrates the program has been achieving these longer-term objectives as well.

The evaluation research did identify some areas where improvements could be implemented as well as areas that would benefit from continued program support. The program faces a few



key challenges going forward. One of these challenges is managing toward aggressive annual energy savings and budgetary goals with multi-year participation and long project lead times. Relatedly, the program incurs considerable risk in funding detailed scoping assessments before any energy savings are realized. In addition, the program has faced staffing limitations, resulting in overtaxed program staff and hesitancy among some account management staff in promoting the program to target customers. Ensuring the program is adequately staffed will be an ongoing challenge, especially as participation increases. Finally, it is challenging to accommodate multi-phase participation programs such as Process Efficiency in central data tracking systems to facilitate implementation and evaluation activities.

Key findings and recommendations from the evaluation are detailed below.

IV. IMPACT EVALUATION FINDINGS

The evaluation included research to inform measure persistence and net savings estimates, discussed next.

Measure persistence is high.

All customers reported the high efficiency equipment they installed through the program is still installed and operating.

Recommendation #1: Assess measure persistence through the program check-ins with customers to monitor if measure persistence remains high or if there are any problem areas that need to be addressed.

The net-to-gross research shows the program has been highly influential in the participant decision making process and confirms the program's current stipulated net-to-gross ratio as a conservative estimate of attribution.

To estimate program net savings, the evaluation team employed a triangulation or preponderance of evidence approach, including customer case studies. Customer case studies are a best practice in the industry for net savings research where there are a limited number of participants accounting for the majority of the programs savings and/or when the participant population is not homogenous (both criteria apply for Process Efficiency participants). The net-to-gross research consisted of 1) a review of program files, 2) interviews with four participating customers recently implementing projects through the program (since the beginning of 2011), 3) case study discussions with Xcel Energy staff involved in the decision-making process (including program and account managers), 4) in-depth interviews with trade allies, 5) a literature review and benchmarking interviews with program managers of similar industrial programs in the US, and 6) results from surveys with eligible nonparticipants.

Based on an analysis of self-report data and case study reviews of the four surveyed participants, the evaluation team calculated a net-to-gross ratio of 93 percent. These results are consistent with feedback from trade allies, and are in line with net-to-gross ratios of similar programs included in the benchmarking research. While the program is too young in



its implementation to recommend a reliable point estimate, the evaluation research supports the program's current net-to-gross ratio of 90 percent as a conservative estimate of program attribution. Going forward, the program is planning on increasing eligibility to commercial customers with at least two GWh of energy conservation potential. The evaluation team expects a similar level of program attribution with this customer segment and does not expect any substantial impact on the net-to-gross ratio from this change.

Recommendation #2: The evaluation team recommends no change to the current stipulated net-to-gross ratio of 90 percent.

V. PROCESS EVALUATION FINDINGS

The process evaluation findings and recommendations synthesize results across program staff interviews, participant and nonparticipant surveys, in-depth interviews with trade allies and benchmarking of similar programs across the U.S. Below we summarize key findings and recommendations in the following areas: program design, program delivery, and program satisfaction.

a. Program Design

The Process Efficiency program is well designed to address the key challenges faced by industrial customers and plays a valuable role in Xcel Energy's business portfolio.

Feedback from program staff, trade allies, and participating and nonparticipating customers indicate the program's combination of business assessments and benchmarking, technical support, and financial incentives address the needs of industrial customers. Participants mentioned budget constraints, aggressive payback periods, and decision-making chain obstacles as key barriers to implementing energy efficiency projects. Participants indicated that the technical and financial support provided the Process Efficiency program helped them overcome these barriers. The detailed analyses and financial incentives have helped firms to prioritize and justify projects to upper level management. In addition, most participants chose to participate in Process Efficiency over other Xcel Energy offerings because of the additional engineering and technical support provided, demonstrating the perceived benefits of these offerings to at least a portion of the target customer segment.

Nonparticipants mentioned facing the same barriers reported by participants, as well as a lack of knowledge about energy savings opportunities. This feedback underlines the value of the technical and business practice support a program like Process Efficiency offers. Trade allies also spoke about the program's ability to help overcome the main barriers faced by industrial customers, particularly gaining buy-in from upper management. Trade allies with experience with other utility programs serving industrial customers regarded Xcel Energy's Process Efficiency program as best in class. Xcel Energy's industrial programs were also recognized in 2011 by the American Consortium for Energy Efficiency (ACEEE) as best in class offerings for the industrial segment¹.

¹ <http://www.aceee.org/press/2011/07/aceee-names-champions-energy-efficiency-industry>



Staff also report that the program has been successful at recruiting customers who historically have not participated in Xcel Energy programs, indicating the program is engaging new customers and filling a niche in the portfolio. The program has also had a high conversion rate—the percent of customers who implement a project identified in a technical assessment or audit. The program's conversion rate is another indicator of the program's success as we have evaluated several nonresidential technical assessment/audit offerings with conversion rates less than fifty percent. Staff attribute this high conversion rate in large part to the program's ability to build and maintain customer relationships.

Recommendation #3: Continue this holistic program offering in the Xcel Energy Business DSM Portfolio.

The program's phased approach has been successful at mitigating decision-chain barriers, identifying opportunities for energy efficiency, and driving project implementation.

One of the strengths of the program's design recognized by internal staff and trade allies is its phased delivery approach, particularly in engaging upper management early on in the participation process and fostering long-term action plans. The three program phases are clearly defined in program informational materials and are designed to build lasting partnership between the customer and Xcel Energy. As part of the initial Phase 1 site visit, the program engages company decision-makers from the outset, reducing the risk of drop-offs due to decision-maker barriers. Phase 2 provides customized scoping studies to identify opportunities and help customers develop a holistic energy management plan. This energy management plan is then implemented in Phase 3 and continually refined.

One possible drawback of the phased approach could be that some customers, upon reaching Phase 3, may feel they have completed all their energy efficiency improvements or become less engaged in the program. The evaluation research conducted concurrently for the Minnesota Process Efficiency program, which has been operating longer than the Colorado program, suggests that some customers are inclined to take "breaks" after addressing the first round of most-implementable projects.

Recommendation #4: Continue the program's phased delivery and commitment to engaging upper management at the beginning of the participation process. Look for ways to keep customers engaged once they reach Phase 3.

The program's holistic approach has been successful in encouraging customers to incorporate energy management into their core business practices.

Xcel Energy is one of only a few programs that emphasize organizational assessments in addition to technical studies. The Process Efficiency uses the EnVINTA One2Five software in Phase 1 of customers' participation to benchmark the customer on various organizational aspects, including: energy consumption, corporate commitment, strategic planning, energy staffing capacity and funding. Program staff report that the tool has been effective at getting customers to think about energy conservation strategically as part of their business. Staff did raise, however, that there are also other similar tools available on the market that could be investigated as well.



Staff believe the program's holistic approach has been effective in incorporating energy efficiency into customer's core business practices and corporate culture, beyond simply replacing specific equipment. These impacts were confirmed by feedback from participating customers. Most participants stated that their company staff understanding of energy processes and/or engagement in energy conservation has increased since enrolling in the program. In addition, half of the interviewed firms said their participation in the program resulted in written energy plans and policies they did not have before. Those who already had plans in place prior to the program reported an increase, improvement or acceleration in the previous energy plans. Firms are taking a wide variety of steps to more actively monitor energy use after initial participation including formally staffing new roles, metering additional equipment/facilities and monitoring energy use in real-time. These findings show that the program is helping customers focus on long-term strategic energy management, which when coupled with the detailed scoping and financial assistance provided by the program, provides a foundation for continuing participation.

Recommendation #5: Continue the program's commitment to incorporating energy management into participant's core business practices. This should include the use of diagnostic assessment and benchmarking tools like EnVINTA, as well as providing continuing technical support and financial incentives for making energy-saving improvements.

The Process Efficiency program's incentive structure with achievement bonuses is consistent with industry best practice and encourages continuing customer engagement.

The Process Efficiency program subsidizes 75 percent of scoping study costs (at minimum) and rebates energy saving improvements at the standard prescriptive end-use and custom incentive levels. In addition, the program offers bonus incentives for completion of key energy management plan milestones or achievement of MOU conservation estimates. Participants reported high satisfaction with project incentive levels, funding for technical assessments and the program's bonus incentive. Respondents most often reported that Xcel Energy's funding projections for technical studies and equipment rebates were initially underestimated.

Incentive bonuses have also been used by other program administrators (e.g., The Energy Trust of Oregon and MidAmerican) as an effective method of encouraging continuing participation and/or encouraging customers to develop comprehensive energy management plans.

Recommendation #6: Continue using current study funding and end-use incentive levels coupled with achievement bonuses. Also, monitor the accuracy of estimates for study funding and project rebates to best inform customers in their decision-making processes.

Managing annual energy savings and budgetary goals with multi-year participation and long project lead times is an ongoing challenge that is not unique to Xcel Energy or the Process Efficiency program.

One challenge discussed by internal staff is tracking progress toward annual energy savings and budgetary goals; given that Process Efficiency projects typically have lengthy lead times before any energy impacts can be captured. By its design, participation in the program is



meant to be a multi-year commitment, even though energy savings and budget targets are set on annual basis. In many cases, the program commits substantial study funding in one program year, even though the program might not be able to claim any energy savings in the same program year. This challenge is exacerbated in Colorado by the limited number of participants. A related ongoing challenge is managing risk associated with devoting substantial resources to technical studies without the guarantee of realizing sufficient energy savings to be cost-effective (e.g. drop outs, limited opportunities for energy savings). This risk underlines the importance of targeting candidates with potential to achieve substantial savings to maintain program cost-effectiveness.

Most of the benchmarked programs also set annual goals, which sometimes present a challenge in trying to complete large capital projects in time to claim savings for a particular year. All of the interviewed utilities with savings goals described pressures trying to finish multi-year projects by calendar end dates, and customers can be similarly inconvenienced when cash outlays are accelerated and do not match their own budget cycles.

The Process Efficiency program in Minnesota recently increased its eligibility from two GWh to one GWh of savings potential. Program staff in Colorado have expressed interest in targeting more mid-size customers to help stabilize the project pipeline with less vulnerability to unpredictable lead times of a few large participants. Feedback from Minnesota staff suggest that this segment comprises the majority of new participants in the Minnesota program and that the change has helped to “smooth-out” the project pipeline.

Recommendation #7: Evaluate participation levels, study conversion rates, realization of energy savings estimates, project lead times, and upfront study costs in setting annual energy savings goals and budgets for the next program filing. Consider increasing program eligibility requirements to smooth out participation (discussed more under Recommendation (#9)).

Internal processes address the overlap in the Process Efficiency program and other Xcel Energy programs within the business program portfolio.

The Process Efficiency program has potential overlap with the Custom, Self-Direct Custom Efficiency, and Standard Offer programs. Xcel Energy has minimized competition among the programs through internal management processes. For example, staff compensation is based on overall portfolio goals as well as individual program goals and adjustments can be made in individual program’s contributions to overall portfolio goals during the program year. In addition, Xcel Energy promotes active communication between overlapping programs in the portfolio to help coordinate specific program activities.

Recommendation #8: Continue internal management processes that encourage individual programs working together to achieve portfolio goals.

Evaluation findings suggest that there may be opportunities to expand program eligibility to mid-size industrial customers and large commercial customers.

Currently, the program is open only to industrial customers and requires a minimum of two GWh in energy savings potential to be eligible for the program. The program is planning on extending eligibility to commercial customers with the same minimum energy savings



potential. All three nonparticipants surveyed who would likely not be eligible for the program based on their annual consumption reported having recently implemented energy efficiency improvements, and only one of these customers recently participated in an Xcel Energy program. In addition, two of these customers have additional plans for energy efficiency improvements in the next three years. That said, all three of these customers have considerably lower annual electric consumption than the current 20 GWh threshold, which may limit the energy savings potential for these customers.

Minnesota Process Efficiency Program staff further reported that mid-size industrial projects have been proven to be cost-effective; however, they are generally less cost-effective than large industrial projects due to the lower energy savings potential for mid-size customers. Additionally, Minnesota staff suggest that mid-size customers seem to value the business practice benchmarking provided by the program even more than large industrial customers who may have more internal resources.

Like Xcel Energy, most benchmarked utilities target their largest industrial energy users. Two benchmarked utilities offer programs open to both industrial customers and commercial customers (MidAmerican Energy and Rocky Mountain Power). According to the Rocky Mountain Power program manager, the technical resources (e.g., engineering services) the program must provide to commercial customers are generally similar to those provided to industrial customers, and there are economies of scale in staffing. A MidAmerican program manager reported that while the types of opportunities differ between the commercial and industrial sectors, the program's delivery is basically the same between the two sectors and they have been able to make commercial projects cost effective.

Relatedly, while trade allies generally agreed that the Process Efficiency program is best suited for large industrial customers; one trade ally reported that there may be some large commercial customers, especially those with campuses housing multiple facilities, who might be good candidates for a program like Process Efficiency.

Recommendation #9: Consider increasing eligibility to mid-size industrial customers in addition to large commercial customers. Assess the cost effectiveness and customer response of the recent change in Minnesota eligibility (from two GWh to one GWh in savings potential) and consider implementing a similar change in Colorado to better manage and help achieve energy savings goals.

b. Program Delivery

Feedback from internal staff suggests the program had been understaffed.

One of the big challenges the program faces is staff resources, which are needed for a holistic, relationship-building program of this nature. Until recently, the program was primarily staffed only by the program manager, an energy efficiency engineer, and a trade relations manager. In comparison, the much larger Minnesota program has three dedicated sales engineers who play a large role coordinating efforts between the energy efficiency engineers, account managers, and customers.

Feedback from staff suggests that the limited staff resources can impact project timelines and customer outreach efforts. Both program staff and account management staff noted some



internal backlogs on some projects due to staffing constraints. In addition, not having a sales engineer has put more work on the shoulders of account managers to carry projects through the program.

Recognizing this challenge, the program added a new marketing assistant and a sales engineer. Because evaluation activities are largely retrospective by nature, the evaluation was not able to investigate the impact of these new positions. However, based on discussions with program staff, the sales engineer in Colorado has been tasked with providing primarily engineering support.

Recommendation #10: As the program grows, evaluate internal staff resources and roles to ensure they are sufficient to effectively deliver the program while maintaining balanced workloads for program and account management staff. This assessment is especially important if Xcel Energy expands program eligibility.

Communication among program and delivery team staff has largely been effective; however, there is room for improvement in coordination between Xcel Energy engineering staff and the program's implementation contractor.

Staff generally report strong internal working relationships, both within Xcel Energy and with the program's implementation contractor for business benchmarking and initial technical assessments. Among Xcel Energy staff, team members report close communication on individual projects and positive interactions among program staff and account management. While internal staff generally also report effective working relationships with the program's implementation contractor, engineering staff note that communication with the implementation contractor has not always been as good as it could be, particularly relating to communicating data needs for running custom analyses. Sometimes the information supplied to engineering staff is not sufficient to complete a custom analysis and additional information needs to be requested. This feedback was echoed by implementation contractor staff. Both Xcel Energy and implementation contractor staff reported that collaboration between the two groups has strengthened over time, but communication could still be improved.

In addition, the program's implementation contractor does not currently have a local presence in Colorado, which was mentioned by staff as a potential area for improving working relationships between Xcel Energy and the implementation contractor. One participating customer also recommended that the program use more local implementation staff.

Recommendation #11: Continue working to strengthen collaboration between Xcel Energy engineering staff and the program's implementation contractor, particularly in communicating and gathering necessary inputs for custom energy analyses. Also, assess the feasibility of adding a local implementation presence in Colorado.

The program's primary customer outreach strategy of leveraging account manager relationships is consistent with benchmarked programs and has been effective in recruiting participants and helping customers through the participation process.

Program managers of benchmarked programs noted that personalized customer recruitment is most effective in engaging large industrial customers in multi-phased programs. Xcel



Energy does this by leveraging account manager relationships to identify leads and inform customers about the program. Program participants learned about the program primarily through their Xcel Energy account manager. Account managers are also closely involved with each stage of customers' participation, from the initial one-day onsite assessment through project implementation. Participating trade allies emphasized the importance of Xcel Energy account managers in the program's implementation, specifically noting their ability to reach the decision-makers, their ability to keep customers engaged in the program, and their project management skills.

Recommendation #12: Continue to leverage account manager relationships to identify project opportunities and inform customers about the Process Efficiency program.

Some account management staff have been more active than others in promoting the Process Efficiency program to target customers.

Feedback from internal staff suggests that there is still some hesitancy among some account managers to actively promote the program to their large industrial customers. Much of this hesitancy appears to be due to program's limited staff resources, which has placed greater administrative burden on account managers (as mentioned above). One account manager in Colorado pointed to this additional responsibility as one of the main reasons why account management staff in Colorado are less likely to actively promote the program to their customers compared to Minnesota. The recent addition of sales engineering staff should help alleviate this burden.

Nonparticipant responses confirmed that there is opportunity for additional account manager outreach. Account management was the top source nonparticipants seek out for information on energy efficiency; however, only one of the three eligible nonparticipants said they had heard of the Process Efficiency program prior to the interview. Both of these respondents expressed interest in participating in the Process Efficiency program in the future and are considering implementing additional energy efficiency actions in the next three years.

One benchmarked program manager who emphasized the important role account management plays in their customer outreach spoke about some of the ways they have been successful in engaging account management. The program manager said they give account managers training on the program and work with them on a task force that meets regularly to discuss how the program is working and how to best address issues that arise.

Recommendation #13: Investigate ways to engage less active account management staff. One approach might be highlighting participant success stories and achievement awards, illustrating the potential benefits to account managers' own customers. Another approach worth considering is using existing forums to solicit account management feedback and address concerns. Finally, the program might work with account management staff to identify ways the recently added sales engineer and marketing assistant positions could possibly help alleviate account managers' workload.

Secondary study providers play an important role in delivering technical scoping studies.



All but one of six trade allies surveyed performed secondary energy assessments as part of Phase 2 scoping studies. Most of these study providers contracted directly with Xcel Energy or the program's implementation contractor to perform services for the program. Secondary study providers are generally used for scoping industry-specific technologies or energy-intensive processes, providing customers with more customized assessments. Using comprehensive engineering and technical resources to deliver energy assessments is consistent with best practices found in the benchmarking study.

While most secondary study providers said expectations for their involvement were clearly communicated by Xcel Energy, one study provider did report that their role was not clear at the beginning of their involvement with the program.

Recommendation #14: Continue to leverage secondary study specialists to support Phase 2 scoping studies and make sure the scope of work and study expectations are fully understood by all parties prior to commissioning work.

Customer progression through the three program phases has historically been tracked manually by program staff and participant tracking data is not centralized.

Internal staff reported that the previous Customer Relationship Management (CRM) tracking system was not designed to easily track customer status within a multi-staged program like Process Efficiency. It was specifically reported that the old CRM was good for tracking individual projects and pre-approvals, but not customer status within the Process Efficiency flow (e.g., which memorandum of understanding (MOU) is signed). Previous program staff often knew customer status details "in their heads", and this status information was tracked in separate spreadsheets. The decentralized data tracking systems presented challenges in assembling the participant data needed for evaluation activities, requiring multiple data requests and additional time commitment from program staff.

Staff report that the new CRM, which is now being used, is addressing many of these issues and has been working well.

Recommendation #15: Continue to evaluate and refine the CRM tracking system to make sure it accommodates the data needed for project tracking and evaluation for continuous or multi-stage participation programs such as Process Efficiency. Specifically, the program should track which Phase MOU has been signed by participants and scoped projects in addition to approved projects, completed projects, and projected savings.

c. Program Satisfaction

Participating customers are highly satisfied with their experiences with the program.

Participants reported high satisfaction with both the program overall and key individual components of their participation. On a zero to ten scale, with ten being very satisfied, the average satisfaction rating with the Process Efficiency program was 9.3. In particular, participants value the funding provided for technical assessments and the end-product provided. Customers reported receiving several benefits from their participation in the Process Efficiency program, including technical support, funding for scoping studies and implementing projects, business practice benchmarking, and helping to establish goals and project timelines.



Recommendation #16: The evaluation team has no additional recommendations for improving customer satisfaction.

Trade allies unanimously reported very positive interactions with program staff and secondary study providers generally view the program as more complementary to their business than competition.

Trades who have worked the program reported that program staff were accessible, communicated effectively with both them and their customers, and were committed to making sure as many study recommendations were implemented as possible. In addition, secondary study providers who were interviewed perceive the program as a vehicle to provide more comprehensive services to their customers, as opposed to a direct threat to their business. Even though Colorado's industrial market is narrow in terms of number of customers, trades believe there is a sustainable pipeline of energy efficiency opportunities among industrial customers, who are continually looking for ways to optimize their production processes.

Recommendation #17: Continue to engage third-party study providers and other trade allies and inform them about partnership opportunities.



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1. GLOSSARY OF IMPACT EVALUATION TERMS

<i>Attribution</i>	Estimation of what would have happened absent a program. Isolating the effects of program factors and other influences in the decision to adopt energy efficiency measures is often referred to as “attribution.” Program attribution refers to energy impacts that can be attributed with some level of confidence to program efforts.
<i>Confidence interval</i>	The confidence interval (which would differ for each sample) encompasses the true population parameter 90 percent of the time if this procedure was repeated on multiple samples ² .
<i>Baseline and technical assumptions</i>	Baseline and technical assumptions are used to determine deemed savings for prescriptive projects. Deemed savings are an estimate of an energy savings and/or demand savings outcome on a “per-unit” basis for installed energy efficiency measures (i.e., a steam trap or motor). The gross savings impact evaluation included a review of the baseline and technical assumptions used in the program calculated deemed savings.
<i>Free-drivers or nonparticipant spillover</i>	<i>Free-drivers</i> , or nonparticipant spillover, refers to any energy efficient measures adopted 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 or practices, product or practice acceptance, customer expectations, and other market effects. All of these may induce nonparticipants to implement energy efficiency measures on their own.
<i>Free-riders</i>	A <i>free-rider</i> refers to a program participant who received an incentive or other assistance through an energy efficiency program who would have adopted the same high-efficiency measure ³ on their own at that same time in the absence of the program. For free-riders, the program is assumed to have had no influence or only a slight influence on their decision to install or implement the energy efficiency measure. Partial free-riders are those customers who would have adopted some measure on their own, but of a lesser efficiency or a lesser quantity, or they would not have adopted the efficient measures until a later time. Thus, the program had some impact on their decision.
<i>Freeridership rate</i>	A program's <i>freeridership rate</i> is the percentage of program savings attributed to free-riders.
<i>Net program effect</i>	The net program effect is the observed effect, less the estimate of what would have happened absent the program.

2 Cox D.R., Hinkley D.V. (1974) Theoretical Statistics, Chapman & Hall, p49, 209

3 For purposes of this discussion, an “energy efficiency measure” includes high efficiency equipment or appliances, an efficiency measure such as insulation, or an energy efficient practice such as boiler tune-ups.



<i>Net-to-gross (NTG) ratio</i>	<p>The ratio of net program-attributable savings over program gross savings. The ratio calculated includes estimates of program free-riders and program-induced spillover.</p> <p>NTG ratio= (1 – free rider rate) + spillover rate.</p> <p>The recommended NTG ratio for a program is based on a preponderance of evidence approach and therefore may differ from the calculated NTG ratio.</p>
<i>Net-to-gross attribution factors</i>	<p>Net-to-gross factors include freeridership and spillover that are typically applied to program gross savings to estimate the net energy and demand savings attributed to the program's activities.</p>
<i>Nonparticipant “like” spillover</i>	<p><i>Nonparticipant “like” spillover</i> refers to additional measures of the same type as offered through the program that are adopted due to the program's influence. For this study, we attempted to quantify nonparticipant “like” spillover through vendor surveys.</p>
<i>Participant “like” spillover</i>	<p>Participant “like” spillover is when the customer adds more of the same technology incented through the program due to program influences but without any financial or technical assistance from the program. Participant “like” spillover in this study is quantified through participant surveys, but is limited to locations within Xcel Energy's territory.</p>
<i>Previous Program Participation</i>	<p>The quantitative participant surveys capture the level of influence that prior participation in Xcel Energy's demand side management programs has had on the customer decision making process for evaluated projects. This is quantified in the net-to-gross factor by reducing freeridership rates based on the level of reported influence of prior program participation, consistent with the Massachusetts standardized net-to-gross methodology⁴.</p>
<i>Self report approach (SRA)</i>	<p>Participant and trade ally self-reports of what they would have done in the absence of the program.</p>
<i>Spillover</i>	<p><i>Spillover</i> refers to additional energy efficiency measures adopted by a customer due to program influences, but without any financial or technical assistance from the program. As this study only quantifies “like” spillover, it is a conservative estimate of spillover resulting from Xcel Energy's programs.</p>
<i>Triangulation</i>	<p><i>Triangulation</i> refers to the comparison of the results of two or more data gathering activities aimed at addressing the same issue to derive a “best” determination from the analysis. Tetra Tech used other results to compare against the customer SRA results and potentially adjusted the NTG ratios based on that comparison if warranted and defensible.</p>

4 Massachusetts Program Administrators Cross-Cutting C&I Freeridership and Spillover Methodology Study Final Report, May 20, 2011, prepared by Tetra Tech, KEMA, and NMR.



Participant

For the purposes of this evaluation, *participants* are defined as customers who have completed an initial Phase 1 one-day visit or have implemented projects with energy savings claimed by the program.

Nonparticipant

For the purposes of this evaluation, *nonparticipants* are defined as customers who are currently eligible or may be eligible for the program in the future but have not yet participated.



2. INTRODUCTION

Xcel Energy is looking for meaningful ways to improve the elements of its demand side management (DSM) business programs, its customer-reach capabilities, and the operation efficiency of their programs so that they can successfully meet program goals and objectives. To assist Xcel Energy in this aim, Xcel Energy selected through a competitive Request for Proposals (RFP) process a third party vendor (comprised of Tetra Tech and Evergreen Economics—hereafter the “Tetra Tech team”) to conduct objective evaluations of their demand side management (DSM) business programs in Minnesota and Colorado. Furthermore, the RFP process selected a DSM business programs evaluation provider for a multi-year period in order to provide research continuity, comprehensive portfolio-level results, and best practices evaluation services.

2.1 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 198,514 commercial customers and 3,802 industrial customers. These include electric only, gas only, and electric and gas customers.

Xcel Energy’s Process Efficiency program in Colorado targets large industrial customers with a minimum annual conservation potential of two GWh. Launched in 2009, the program was developed in response to requests from customers who have significant energy conservation potential but lack available resources or internal expertise. The program is designed to help customers develop and implement holistic and comprehensive energy management plans by offering technical support, business practice benchmarking, funding for detailed scoping studies, and rebates for qualifying energy conservation projects. Program marketing and outreach efforts are primarily driven through Xcel Energy account representative relationships with target customers. The program is traditionally delivered in three cyclical phases: 1) identification, 2) scoping, and 3) implementation. Each of these phases is defined and detailed in a memorandum of understanding (MOU) specific for each participant. Xcel Energy contracts a third-party provider to deliver Phase 1 of the program and provide assistance with Phase 2 scoping studies. Third-party study specialists are also used to provide customized Phase 2 scoping support for the program.

There are a few key differences between the Process Efficiency program in Colorado and its counterpart program in Minnesota. The Minnesota program currently targets customers with at least one GWh in savings potential, compared to two GWh in Colorado. Also, the Minnesota program offers incentives for both electric and natural gas saving projects, whereas the Colorado program has dropped its natural gas component due to the small number of opportunities. Another key difference is that the Minnesota program utilizes three sales engineers to assist participating customers and other Xcel Energy staff. Until recently, the Process Efficiency program team in Colorado did not include any sales engineers. Sales engineers play a key role in scoping projects and developing implementation plans in the Minnesota program. They spend 80 to 100 percent of their time on the Process Efficiency program, and their technical expertise often makes the account managers much more comfortable interfacing with customers. The sales engineers attend most customer meetings, develop application materials, and work with the technical energy efficiency engineers (EEEs) to get needed information from customers and vendors. They often know the best contact in



the customer organization (not always the customer project manager) to get operational details.

2.2 PROGRAM LOGIC MODEL AND PROCESS FLOW MAP

A program logic model documents the activities a program undertakes and the intended consequences of those activities. In addition, it lists the inputs and resources (e.g., available staff, budget) needed to complete those activities. Evaluators drafted a program logic model in March and April of 2012 based on a review of program documentation and interviews with program staff. The logic model presented in Figure 2-1 includes edits based on product manager feedback.

The Process Efficiency program has four overall activities: develop program infrastructure, customer communications, complete audit and scoping phases, and project implementation and rebates. These activities have both short and long-term goals including knowledgeable Xcel Energy staff, implementation of “deeper” energy savings, and long term strategies to integrate energy efficiency into customers’ business practices.



Figure 2-1. Colorado Process Efficiency Logic Model

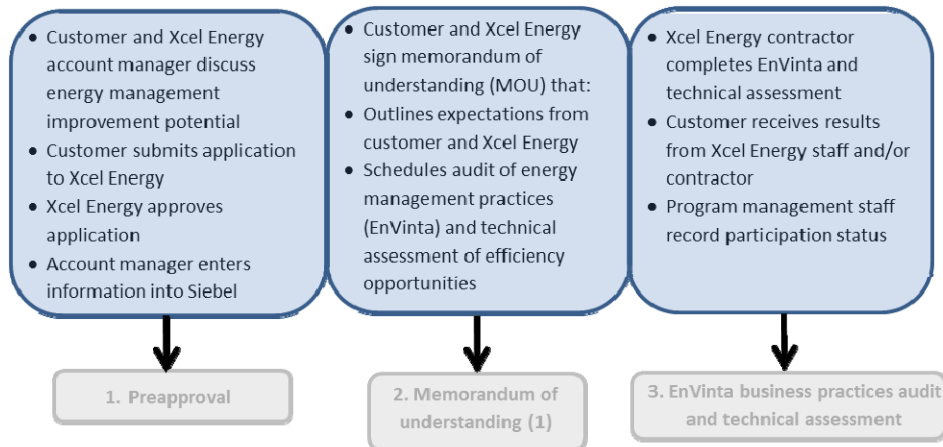
Inputs/ Resources	Sufficient budget is allocated	Marketing materials, program website, and informational materials	MOU templates	MOU templates
	Xcel Energy Process Efficiency Team (Program Manager and assistants, Account Managers, EEs)	RFP process to select audit firms and tools		
	Impact targets and customer billing data			
Activities	Develop Program Infrastructure	Customer Communications	Complete Audit and Scoping Phases	Project Implementation and Rebates
Outputs	Program eligibility, incentives, website, and marketing strategy developed	Account Managers communicate program offerings to target customers	Customers complete business practices audits and technical assessments to identify potential projects	MOU3 defining rebates, bonuses, and conservation goals are customized and signed
	Xcel Energy staff trained on eligible customers and projects, and participation processes	Personal visits with large industrial customers and associated vendors	Customers develop action plans	Projects are completed and customer submits project invoices
	Tracking systems developed and necessary information is captured	Program information available at customer workshops, Industrial Expo	MOU2 committing customer and Xcel Energy resources, defining preliminary incentives are signed	Energy savings are verified according to existing product protocols
	Audit firms and tools selected	Customers and Xcel Energy sign MOU1 outlining expectation from customer and Xcel Energy	Detailed project lists developed; detailed engineering analysis	Customer receives adjusted rebate payment (and bonus if applicable) upon project completion in a timely manner
	Installation verification procedures established		Customers and Xcel Energy sign MOU3 for project implementation	
Short to medium term outcomes	Xcel Energy staff knowledgeable about the program and its resources	Program offerings are valuable and participation requirements are clear to customers	Program assures that projects lead to defensible energy savings because of high customer involvement	Efficient equipment installed and processes improved; kW, kWh and therms savings
	Program design and delivery is continuously improved	Customers find value in program offerings and perceive benefits to their business	Customers perceive the benefits of optimizing their energy-intensive processes	Increased reliability and productivity (reduced O&M \$), longer lifetimes (reduced capital \$)
	Energy saving goals of Process Efficiency program are achieved within budgetary constraints		Key decision-makers at customer drive participation and commit to long-term, "deep" savings	Energy efficiency integrated into participants' capital budgeting and organizational structure
Long term outcomes	Energy savings goals are achieved cost-effectively and with high participant satisfaction	Increased market awareness of energy efficiency and participation in energy efficiency improvements among Xcel Energy's large industrial customers	Customers have deeper understanding of their process energy consumption and how much is controllable	Energy efficiency integrated into participants' corporate philosophy and policies
			Participants develop and refine long-term strategic energy management plans	Customers develop a lasting relationship with Xcel Energy to continue optimizing production processes



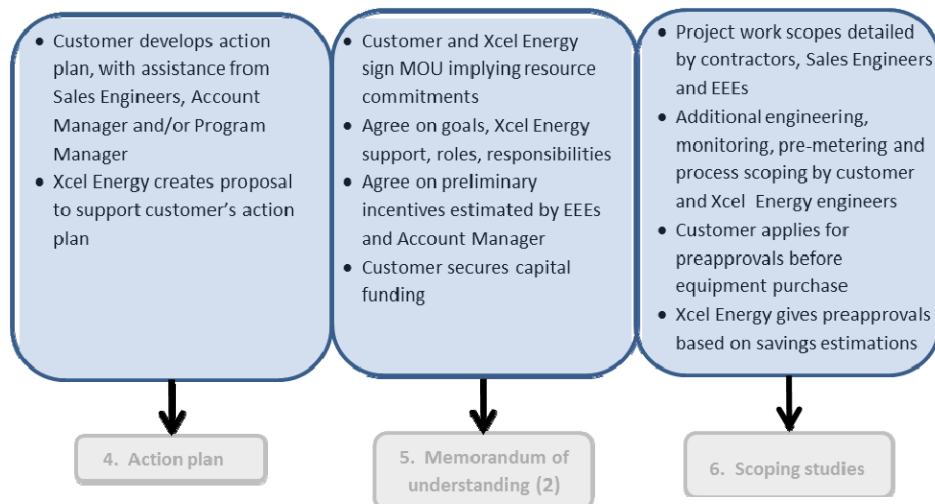
In addition, the evaluation team reviewed and updated the program's existing process flow map to further capture the program's design and delivery. Process flow maps capture key implementation tasks and coordination points across the different groups involved in program delivery. The process flow map for the Colorado Process Efficiency program is detailed in Figure 2-2.

Figure 2-2. Colorado Process Efficiency Process Flow Map

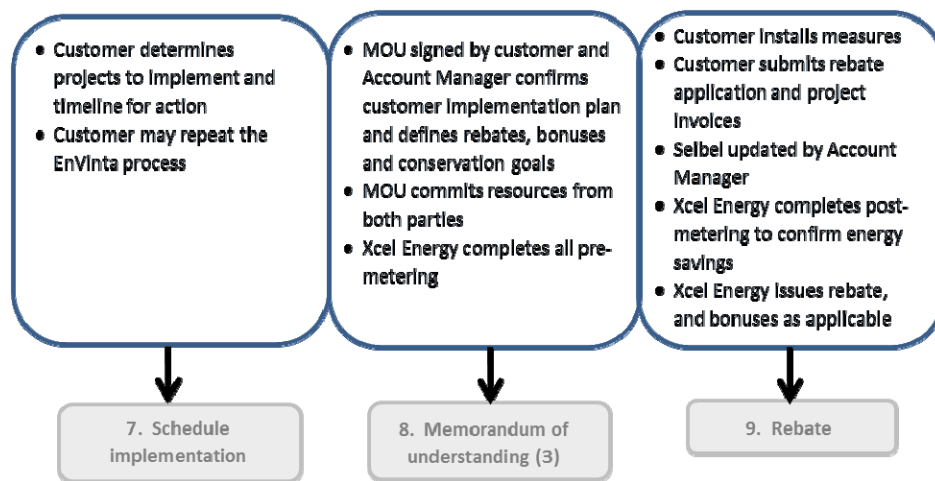
Phase I – Energy management improvement opportunity assessment (identification)



Phase II - Scoping



Phase III – Implementation





2.3 EVALUATION METHODOLOGY

The Tetra Tech team conducted an evaluation of the program. The process evaluation provides Xcel Energy with a thorough understanding of participating and nonparticipating industrial customer and trade ally awareness, attitudes and behaviors as well as benchmarked information for similar programs offered throughout the country. The impact evaluation includes net-to-gross research, and employs triangulation methods and case studies to inform 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 and process flow map (included nine interviews with the following staff: program manager (1), team lead/channel manager (1), rebate specialists (1), account manager (1), energy efficiency engineers (1), regulatory affairs (1), and implementation contractors (3)).
- Task 3: Customer surveys (included eight participant surveys and six nonparticipant surveys)
- Task 4: Trade ally interviews (included six qualitative trade ally interviews)
- Task 5b: Net to gross research
- Task 6: Peer utility benchmarking (included secondary research on ten other utility programs and in-depth interviews with four 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 task that directly supports the impact evaluation is the net-to-gross research using a triangulation method (participant surveys, nonparticipant surveys, trade ally surveys and interviews, and benchmarking study results) as well as a case study approach.

2.4 REPORT ORGANIZATION

Section 3 of this report synthesizes overall key findings across all of the evaluation activities. Sections 4 through 9 detail results from each of the evaluation activities as follows: internal review, participant surveys, nonparticipant surveys, trade ally interviews, peer utility benchmarking, and net-to-gross analysis. Detailed appendices contain all data collection instruments used for the evaluation as well as survey cooperation rates. The appendices also include a detailed discussion of market transformation.

3. SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

3.1 OVERVIEW OF PROGRAM SUCCESSES AND CHALLENGES

Based on extensive primary research with Xcel Energy program staff, program staff managing industrial programs in other territories, program participants, trade allies working with the program, and nonparticipating Xcel Energy customers, the program is operating effectively with high program attribution and delivering substantial benefits to industrial customers. Most specifically, the evaluation research indicates that the comprehensive program design is an important component of Xcel Energy's demand side management portfolio. The target segment places high value on the program technical assistance and support, which was reported to be as important as the rebate in both identifying and gaining approval for implementation of projects.

Through its first three years of implementation, the program has achieved several key successes. With its holistic design and phased delivery, the Process Efficiency program is an industry leader among programs serving industrial customers. The program has delivered high customer satisfaction, providing customers with the tools and financial assistance to help them integrate energy conservation into their core business. Although the program has fallen short of its annual goals this first three-year program cycle, it has built a robust pipeline of projects expected to be completed within the next couple of years. The program's emphasis on building long-term energy management plans and changing corporate culture should also continue to produce energy-saving projects, as the evaluation research demonstrates the program has been achieving these longer-term objectives as well.

The evaluation research did identify some areas where improvements could be implemented as well as areas that would benefit from continued program support. The program faces a few key challenges going forward. One of these challenges is managing toward aggressive annual energy savings and budgetary goals with multi-year participation and long project lead times. Relatedly, the program incurs considerable risk in funding detailed scoping assessments before any energy savings are realized. In addition, the program has faced staffing limitations, resulting in overtaxed program staff and hesitancy among some account management staff in promoting the program to target customers. Ensuring the program is adequately staffed will be an ongoing challenge, especially as participation increases. Finally, it is challenging to accommodate multi-phase participation programs such as Process Efficiency in central data tracking systems to facilitate implementation and evaluation activities.

Key findings and recommendations from the evaluation are detailed below.

3.2 IMPACT EVALUATION FINDINGS

The evaluation included research to inform measure persistence and net savings estimates, discussed next.

3. Summary of Key Findings and Recommendations

Measure persistence is high.

All customers reported the high efficiency equipment they installed through the program is still installed and operating.

Recommendation #1: Assess measure persistence through the program check-ins with customers to monitor if measure persistence remains high or if there are any problem areas that need to be addressed.

The net-to-gross research shows the program has been highly influential in the participant decision making process and confirms the program's current stipulated net-to-gross ratio as a conservative estimate of attribution.

To estimate program net savings, the evaluation team employed a triangulation or preponderance of evidence approach, including customer case studies. Customer case studies are a best practice in the industry for net savings research where there are a limited number of participants accounting for the majority of the programs savings and/or when the participant population is not homogenous (both criteria apply for Process Efficiency participants). The net-to-gross research consisted of 1) a review of program files, 2) interviews with four participating customers recently implementing projects through the program (since the beginning of 2011), 3) case study discussions with Xcel Energy staff involved in the decision-making process (including program and account managers), 4) in-depth interviews with trade allies, 5) a literature review and benchmarking interviews with program managers of similar industrial programs in the US, and 6) results from surveys with eligible nonparticipants.

Based on an analysis of self-report data and case study reviews of the four surveyed participants, the evaluation team calculated a net-to-gross ratio of 93 percent. These results are consistent with feedback from trade allies, and are in line with net-to-gross ratios of similar programs included in the benchmarking research. While the program is too young in its implementation to recommend a reliable point estimate, the evaluation research supports the program's current net-to-gross ratio of 90 percent as a conservative estimate of program attribution. Going forward, the program is planning on increasing the eligibility to commercial customers with at least two GWh of energy conservation potential. The evaluation team expects a similar level of program attribution with this customer segment and does not expect any substantial impact on the net-to-gross ratio from this change.

Recommendation #2: The evaluation team recommends no change to the current stipulated net-to-gross ratio of 90 percent.

3.3 PROCESS EVALUATION FINDINGS

The process evaluation findings and recommendations synthesize results across program staff interviews, participant and nonparticipant surveys, in-depth interviews with trade allies and benchmarking of similar programs across the U.S. Below we summarize key findings and recommendations in the following areas: program design, program delivery, and program satisfaction.

3. Summary of Key Findings and Recommendations

3.3.1 Program Design

The Process Efficiency program is well designed to address the key challenges faced by industrial customers and plays a valuable role in Xcel Energy's business portfolio.

Feedback from program staff, trade allies, and participating and nonparticipating customers indicate the program's combination of business assessments and benchmarking, technical support, and financial incentives address the needs of industrial customers. Participants mentioned budget constraints, aggressive payback periods, and decision-making chain obstacles as key barriers to implementing energy efficiency projects. Participants indicated that the technical and financial support provided the Process Efficiency program helped them overcome these barriers. The detailed analyses and financial incentives have helped firms to prioritize and justify projects to upper level management. In addition, most participants chose to participate in Process Efficiency over other Xcel Energy offerings because of the additional engineering and technical support provided, demonstrating the perceived benefits of these offerings to at least a portion of the target customer segment.

Nonparticipants mentioned facing the same barriers reported by participants, as well as a lack of knowledge about energy savings opportunities. This feedback underlines the value of the technical and business practice support a program like Process Efficiency offers. Trade allies also spoke about the program's ability to help overcome the main barriers faced by industrial customers, particularly gaining buy-in from upper management. Trade allies with experience with other utility programs serving industrial customers regarded Xcel Energy's Process Efficiency program as best in class. Xcel Energy's industrial programs were also recognized in 2011 by the American Consortium for Energy Efficiency (ACEEE) as best in class offerings for the industrial segment⁵.

Staff also report that the program has been successful at recruiting customers who historically have not participated in Xcel Energy programs, indicating the program is engaging new customers and filling a niche in the portfolio. The program has also had a high conversion rate – the percent of customers who implement a project identified in a technical assessment or audit. The program's conversion rate is another indicator of the program's success as we have evaluated several nonresidential technical assessment/audit offerings with conversion rates less than fifty percent. Staff attribute this high conversion rate in large part to the program's ability to build and maintain customer relationships.

Recommendation #3: Continue this holistic program offering in the Xcel Energy Business DSM Portfolio.

The program's phased approach has been successful at mitigating decision-chain barriers, identifying opportunities for energy efficiency, and driving project implementation.

One of the strengths of the program's design recognized by internal staff and trade allies is its phased delivery approach, particularly in engaging upper management early on in the

⁵ <http://www.aceee.org/press/2011/07/aceee-names-champions-energy-efficiency-industry>

3. Summary of Key Findings and Recommendations

participation process and fostering long-term action plans. The three program phases are clearly defined in program informational materials and are designed to build lasting partnership between the customer and Xcel Energy. As part of the initial Phase 1 site visit, the program engages company decision-makers from the outset, reducing the risk of drop-offs due to decision-maker barriers. Phase 2 provides customized scoping studies to identify opportunities and help customers develop a holistic energy management plan. This energy management plan is then implemented in Phase 3 and continually refined.

One possible drawback of the phased approach could be that some customers, upon reaching Phase 3, may feel they have completed all their energy efficiency improvements or become less engaged in the program. The evaluation research conducted concurrently for the Minnesota Process Efficiency program, which has been operating longer than the Colorado program, suggests that some customers are inclined to take “breaks” after addressing the first round of most-implementable projects.

Recommendation #4: Continue the program’s phased delivery and commitment to engaging upper management at the beginning of the participation process. Look for ways to keep customers engaged once they reach Phase 3.

The program’s holistic approach has been successful in encouraging customers to incorporate energy management into their core business practices.

Xcel Energy is one of only a few programs that emphasize organizational assessments in addition to technical studies. The Process Efficiency uses the EnVINTA One2Five software in Phase 1 of customers’ participation to benchmark the customer on various organizational aspects, including: energy consumption, corporate commitment, strategic planning, energy staffing capacity and funding. Program staff report that the tool has been effective at getting customers to think about energy conservation strategically as part of their business. Staff did raise, however, that there are also other similar tools available on the market that could be investigated as well.

Staff believe the program’s holistic approach has been effective in incorporating energy efficiency into customer’s core business practices and corporate culture, beyond simply replacing specific equipment. These impacts were confirmed by feedback from participating customers. Most participants stated that their company staff understanding of energy processes and/or engagement in energy conservation has increased since enrolling in the program. In addition, half of the interviewed firms said their participation in the program resulted in written energy plans and policies they did not have before. Those who already had plans in place prior to the program reported an increase, improvement or acceleration in the previous energy plans. Firms are taking a wide variety of steps to more actively monitor energy use after initial participation including formally staffing new roles, metering additional equipment/facilities and monitoring energy use in real-time. These findings show that the program is helping customers focus on long-term strategic energy management, which when coupled with the detailed scoping and financial assistance provided by the program, provides a foundation for continuing participation.

Recommendation #5: Continue the program’s commitment to incorporating energy management into participant’s core business practices. This should include the use of

3. Summary of Key Findings and Recommendations

diagnostic assessment and benchmarking tools like EnVINTA, as well as providing continuing technical support and financial incentives for making energy-saving improvements.

The Process Efficiency program's incentive structure with achievement bonuses is consistent with industry best practice and encourages continuing customer engagement.

The Process Efficiency program subsidizes 75 percent of scoping study costs (at minimum) and rebates energy saving improvements at the standard prescriptive end-use and custom incentive levels. In addition, the program offers bonus incentives for completion of key energy management plan milestones or achievement of MOU conservation estimates. Participants reported high satisfaction with project incentive levels, funding for technical assessments and the program's bonus incentive. Respondents most often reported that Xcel Energy's funding projections for technical studies and equipment rebates were initially underestimated.

Incentive bonuses have also been used by other program administrators (e.g., The Energy Trust of Oregon and MidAmerican) as an effective method of encouraging continuing participation and/or encouraging customers to develop comprehensive energy management plans.

Recommendation #6: Continue using current study funding and end-use incentive levels coupled with achievement bonuses. Also, monitor the accuracy of estimates for study funding and project rebates to best inform customers in their decision-making processes.

Managing annual energy savings and budgetary goals with multi-year participation and long project lead times is an ongoing challenge that is not unique to Xcel Energy or the Process Efficiency program.

One challenge discussed by internal staff is tracking progress toward annual energy savings and budgetary goals; given that Process Efficiency projects typically have lengthy lead times before any energy impacts can be captured. By its design, participation in the program is meant to be a multi-year commitment, even though energy savings and budget targets are set on annual basis. In many cases, the program commits substantial study funding in one program year, even though the program might not be able to claim any energy savings in the same program year. This challenge is exacerbated in Colorado by the limited number of participants. A related ongoing challenge is managing risk associated with devoting substantial resources to technical studies without the guarantee of realizing sufficient energy savings to be cost-effective (e.g. drop outs, limited opportunities for energy savings). This risk underlines the importance of targeting candidates with potential to achieve substantial savings to maintain program cost-effectiveness.

Most of the benchmarked programs also set annual goals, which sometimes present a challenge in trying to complete large capital projects in time to claim savings for a particular year. All of the interviewed utilities with savings goals described pressures trying to finish multi-year projects by calendar end dates, and customers can be similarly inconvenienced when cash outlays are accelerated and do not match their own budget cycles.

3. Summary of Key Findings and Recommendations

The Process Efficiency program in Minnesota recently increased its eligibility from two GWh to one GWh of savings potential. Program staff in Colorado have expressed interest in targeting more mid-size customers to help stabilize the project pipeline with less vulnerability to unpredictable lead times of a few large participants. Feedback from Minnesota staff suggest that this segment comprises the majority of new participants in the Minnesota program and that the change has helped to “smooth-out” the project pipeline.

Recommendation #7: Evaluate participation levels, study conversion rates, realization of energy savings estimates, project lead times, and upfront study costs in setting annual energy savings goals and budgets for the next program filing. Consider increasing program eligibility requirements to smooth out participation (discussed more under Recommendation (#9)).

Internal processes address the overlap in the Process Efficiency program and other Xcel Energy programs within the business program portfolio.

The Process Efficiency program has potential overlap with the Custom, Self-Direct Custom Efficiency, and Standard Offer programs. Xcel Energy has minimized competition among the programs through internal management processes. For example, staff compensation is based on overall portfolio goals as well as individual program goals and adjustments can be made in individual program’s contributions to overall portfolio goals during the program year. In addition, Xcel Energy promotes active communication between overlapping programs in the portfolio to help coordinate specific program activities.

Recommendation #8: Continue internal management processes that encourage individual programs working together to achieve portfolio goals.

Evaluation findings suggest that there may be opportunities to expand program eligibility to mid-size industrial customers and large commercial customers.

Currently, the program is open only to industrial customers and requires a minimum of two GWh in energy savings potential to be eligible for the program. The program is planning on extending eligibility to commercial customers with the same minimum energy savings potential. All three nonparticipants surveyed who would likely not be eligible for the program based on their annual consumption reported having recently implemented energy efficiency improvements, and only one of these customers recently participated in an Xcel Energy program. In addition, two of these customers have additional plans for energy efficiency improvements in the next three years. That said, all three of these customers have considerably lower annual electric consumption than the current 20 GWh threshold, which may limit the energy savings potential for these customers.

Minnesota Process Efficiency Program staff further reported that mid-size industrial projects have been proven to be cost-effective; however, they are generally less cost-effective than large industrial projects due to the lower energy savings potential for mid-size customers. Additionally, Minnesota staff suggest that mid-size customers seem to value the business practice benchmarking provided by the program even more than large industrial customers who may have more internal resources.

3. Summary of Key Findings and Recommendations

Like Xcel Energy, most benchmarked utilities target their largest industrial energy users. Two benchmarked utilities offer programs open to both industrial customers and commercial customers (MidAmerican Energy and Rocky Mountain Power). According to the Rocky Mountain Power program manager, the technical resources (e.g., engineering services) the program must provide to commercial customers are generally similar to those provided to industrial customers, and there are economies of scale in staffing. A MidAmerican program manager reported that while the types of opportunities differ between the commercial and industrial sectors, the program's delivery is basically the same between the two sectors and they have been able to make commercial projects cost effective.

Relatedly, while trade allies generally agreed that the Process Efficiency program is best suited for large industrial customers; one trade ally reported that there may be some large commercial customers, especially those with campuses housing multiple facilities, who might be good candidates for a program like Process Efficiency.

Recommendation #9: Consider increasing eligibility to mid-size industrial customers in addition to large commercial customers. Assess the cost effectiveness and customer response of the recent change in Minnesota eligibility (from two GWh to one GWh in savings potential) and consider implementing a similar change in Colorado to better manage and help achieve energy savings goals.

3.3.2 Program Delivery

Feedback from internal staff suggests the program had been understaffed.

One of the big challenges the program faces is staff resources, which are needed for a holistic, relationship-building program of this nature. Until recently, the program was primarily staffed only by the program manager, an energy efficiency engineer, and a trade relations manager. In comparison, the much larger Minnesota program has three dedicated sales engineers who play a large role coordinating efforts between the energy efficiency engineers, account managers, and customers.

Feedback from staff suggests that the limited staff resources can impact project timelines and customer outreach efforts. Both program staff and account management staff noted some internal backlogs on some projects due to staffing constraints. In addition, not having a sales engineer has put more work on the shoulders of account managers to carry projects through the program.

Recognizing this challenge, the program added a new marketing assistant and a sales engineer. Because evaluation activities are largely retrospective by nature, the evaluation was not able to investigate the impact of these new positions. However, based on discussions with program staff, the sales engineer in Colorado has been tasked with providing primarily engineering support.

Recommendation #10: As the program grows, continue to evaluate internal staff resources and roles to ensure they are sufficient to effectively deliver the program while maintaining balanced workloads for program and account management staff. This assessment is especially important if Xcel Energy expands program eligibility.

3. Summary of Key Findings and Recommendations

Communication among program and delivery team staff has largely been effective; however, there is room for improvement in coordination between Xcel Energy engineering staff and the program's implementation contractor.

Staff generally report strong internal working relationships, both within Xcel Energy and with the program's implementation contractor for business benchmarking and initial technical assessments. Among Xcel Energy staff, team members report close communication on individual projects and positive interactions among program staff and account management. While internal staff generally also report effective working relationships with the program's implementation contractor, engineering staff note that communication with the implementation contractor has not always been as good as it could be, particularly relating to communicating data needs for running custom analyses. Sometimes the information supplied to engineering staff is not sufficient to complete a custom analysis and additional information needs to be requested. This feedback was echoed by implementation contractor staff. Both Xcel Energy and implementation contractor staff reported that collaboration between the two groups has strengthened over time, but communication could still be improved.

In addition, the program's implementation contractor does not currently have a local presence in Colorado, which was mentioned by staff as a potential area for improving working relationships between Xcel Energy and the implementation contractor. One participating customer also recommended that the program use more local implementation staff.

Recommendation #11: Continue working to strengthen collaboration between Xcel Energy engineering staff and the program's implementation contractor, particularly in communicating and gathering necessary inputs for custom energy analyses. Also, assess the feasibility of adding a local implementation presence in Colorado.

The program's primary customer outreach strategy of leveraging account manager relationships is consistent with benchmarked programs and has been effective in recruiting participants and helping customers through the participation process.

Program managers of benchmarked programs noted that personalized customer recruitment is most effective in engaging large industrial customers in multi-phased programs. Xcel Energy does this by leveraging account manager relationships to identify leads and inform customers about the program. Program participants learned about the program primarily through their Xcel Energy account manager. Account managers are also closely involved with each stage of customers' participation, from the initial one-day onsite assessment through project implementation. Participating trade allies emphasized the importance of Xcel Energy account managers in the program's implementation, specifically noting their ability to reach the decision-makers, their ability to keep customers engaged in the program, and their project management skills.

Recommendation #12: Continue to leverage account manager relationships to identify project opportunities and inform customers about the Process Efficiency program.

Some account management staff have been more active than others in promoting the Process Efficiency program to target customers.

3. Summary of Key Findings and Recommendations

Feedback from internal staff suggests that there is still some hesitancy among some account managers to actively promote the program to their large industrial customers. Much of this hesitancy appears to be due to program's limited staff resources, which has placed greater administrative burden on account managers (as mentioned above). One account manager in Colorado pointed to this additional responsibility as one of the main reasons why account management staff in Colorado are less likely to actively promote the program to their customers compared to Minnesota. The recent addition of sales engineering staff should help alleviate this burden.

Nonparticipant responses confirmed that there is opportunity for additional account manager outreach. Account management was the top source nonparticipants seek out for information on energy efficiency; however, only one of the three eligible nonparticipants said they had heard of the Process Efficiency program prior to the interview. Both of these respondents expressed interest in participating in the Process Efficiency program in the future and are considering implementing additional energy efficiency actions in the next three years.

One benchmarked program manager who emphasized the important role account management plays in their customer outreach spoke about some of the ways they have been successful in engaging account management. The program manager said they give account managers training on the program and work with them on a task force that meets regularly to discuss how the program is working and how to best address issues that arise.

Recommendation #13: Investigate ways to engage less active account management staff. One approach might be highlighting participant success stories and achievement awards, illustrating the potential benefits to account managers' own customers. Another approach worth considering is using existing forums to solicit account management feedback and address concerns. Finally, the program might work with account management staff to identify ways the recently added sales engineer and marketing assistant positions could possibly help alleviate account managers' workload.

Secondary study providers play an important role in delivering technical scoping studies.

All but one of six trade allies surveyed performed secondary energy assessments as part of Phase 2 scoping studies. Most of these study providers contracted directly with Xcel Energy or the program's implementation contractor to perform services for the program. Secondary study providers are generally used for scoping industry-specific technologies or energy-intensive processes, providing customers with more customized assessments. Using comprehensive engineering and technical resources to deliver energy assessments is consistent with best practices found in the benchmarking study.

While most secondary study providers said expectations for their involvement were clearly communicated by Xcel Energy, one study provider did report that their role was not clear at the beginning of their involvement with the program.

3. Summary of Key Findings and Recommendations

Recommendation #14: Continue to leverage secondary study specialists to support Phase 2 scoping studies and make sure the scope of work and study expectations are fully understood by all parties prior to commissioning work.

Customer progression through the three program phases has historically been tracked manually by program staff and participant tracking data is not centralized.

Internal staff reported that the previous Customer Relationship Management (CRM) tracking system was not designed to easily track customer status within a multi-staged program like Process Efficiency. It was specifically reported that the old CRM was good for tracking individual projects and pre-approvals, but not customer status within the Process Efficiency flow (e.g., which memorandum of understanding (MOU) is signed). Previous program staff often knew customer status details “in their heads”, and this status information was tracked in separate spreadsheets. The decentralized data tracking systems presented challenges in assembling the participant data needed for evaluation activities, requiring multiple data requests and additional time commitment from program staff.

Staff report that the new CRM, which is now being used, is addressing many of these issues and has been working well.

Recommendation #15: Continue to evaluate and refine the CRM tracking system to make sure it accommodates the data needed for project tracking and evaluation for continuous or multi-stage participation programs such as Process Efficiency. Specifically, the program should track which Phase MOU has been signed by participants and scoped projects in addition to approved projects, completed projects, and projected savings.

3.3.3 Program Satisfaction

Participating customers are highly satisfied with their experiences with the program.

Participants reported high satisfaction with both the program overall and key individual components of their participation. On a zero to ten scale, with ten being very satisfied, the average satisfaction rating with the Process Efficiency program was 9.3. In particular, participants value the funding provided for technical assessments and the end-product provided. Customers reported receiving several benefits from their participation in the Process Efficiency program, including technical support, funding for scoping studies and implementing projects, business practice benchmarking, and helping to establish goals and project timelines.

Recommendation #16: The evaluation team has no additional recommendations for improving customer satisfaction.

Trade allies unanimously reported very positive interactions with program staff and secondary study providers generally view the program as more complementary to their business than competition.

Trades who have worked the program reported that program staff were accessible, communicated effectively with both them and their customers, and were committed to making sure as many study recommendations were implemented as possible. In addition, secondary study providers who were interviewed perceive the program as a vehicle to provide more

3. Summary of Key Findings and Recommendations

comprehensive services to their customers, as opposed to a direct threat to their business. Even though Colorado's industrial market is narrow in terms of number of customers, trades believe there is a sustainable pipeline of energy efficiency opportunities among industrial customers, who are continually looking for ways to optimize their production processes.

Recommendation #17: Continue to engage third-party study providers and other trade allies and inform them about partnership opportunities.

4. EVALUATION RESULTS – INTERNAL REVIEW

This section provides high-level results from internal interviews with 30 Xcel Energy and implementation contractor staff who work with the Business DSM Programs, nine of whom work directly with the Process Efficiency program.

4.1 INTRODUCTION

For the internal interviews, evaluators conducted nine interviews with program staff, including interviews with the program manager (1), team lead/channel manager (1), rebate specialists (1), account manager (1), energy efficiency engineers (1), regulatory affairs (1), and implementation contractors (3).

Evaluators conducted these interviews over a four week period in March of 2012. The interviews covered a variety of issues, including:

- Roles and responsibilities of the staff
- Communication and interaction with others in the program
- Program design
- Resources to support the program
- 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

This section highlights key findings for Xcel Energy's consideration at the program-level.

4.2 SUMMARY OF OVERALL FINDINGS

Xcel Energy has a well-developed and coordinated DSM staffing infrastructure. This staffing structure has been key to the success of its programs by facilitating both customer and trade ally outreach and engagement. Staff juggle multiple responsibilities, which can be demanding. For example, program managers generally oversee multiple programs. While some areas for additional staffing resources were identified and will be discussed as relevant in program-specific findings, in general Xcel Energy is proactively identifying and addressing staffing needs. One example is the re-organization of the Business Solutions Center (BSC) two years ago. Another example is the creation of the team lead position approximately a year ago; both

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are discussed below. Xcel Energy should continue to assess DSM staffing resources and structure as the programs evolve. One issue that seems to be recurring across the internal staff interviews is a sense of “competition” for customers and projects among the different programs in the portfolio. Xcel Energy may want to investigate strategies to promote more cooperation across programs.

Multiple internal staff support Xcel Energy’s DSM programs: program managers, marketing managers, regulatory affairs staff, team leads, marketing assistants, energy efficiency and sales engineers, channel managers, account managers, BSC energy efficiency specialists, and rebate processors. Program managers oversee each program and are responsible for their program design and goals, monitoring goals, developing contingency plans and pursuing effective marketing and communication strategies. Marketing managers monitor overall program performance and make adjustments as needed to ensure the overall DSM portfolio meets its goals by state. A new role that was added in 2011 was “team lead.” Team leads are designated for each program group in order to specifically focus on strategies for a particular program-type and monitor their performance. There is a prescriptive program team lead for the Cooling Efficiency program in each state and a holistic team lead in each state for the Process Efficiency Program. Team leads’ responsibilities also include overseeing their own programs. Team leads work with the program managers and then directly report to the marketing managers. Marketing managers report to 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. Communications among the groups appear to be working fairly well. The new position of team lead should help with communications between marketing managers and program managers.

Marketing assistants support program 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. Sales engineers support programs such as the Process Efficiency program that need additional engineering resources during the program participation process. Account managers are the first point of contact for managed accounts, as well as a conduit between managed customers and the marketing and program teams. Channel managers oversee the relationships between the DSM programs and trade allies or vendors. Channel managers both identify and train new trade allies as well as work with established vendors and distributors to market Xcel Energy’s DSM programs. Channel managers also engage trade allies in Advisory Councils that meet periodically to provide advice and input on Xcel Energy’s DSM programs. Rebate processors complete program documentation to ensure the customer receives their rebate.

In 2010, Xcel Energy reorganized their Business Solutions Center (BSC) to include energy-efficiency specialists, whose main focus is to promote energy-efficiency programs to non-managed customers (as Process Efficiency is intended for only the largest industrial customers, the BSC is not used as a marketing tool for that program). They were trained specifically on energy-efficiency and Xcel Energy’s program offerings. These energy-efficiency specialists conduct direct marketing to customers, as well as field questions and

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assist customers in filling out their applications. Additionally, customer-service centered BSC representatives handle a wide variety of customer service tasks and are an additional point to which customers can be funneled into Xcel Energy programs. This re-organization appears to be working well. BSC staff indicated that internal trainings so far had been effective, and one staff member felt that the trainings should continue well into the future, as Xcel Energy has a broad variety of program offerings and the energy-efficiency market is constantly shifting.

Lastly, there are established tracking systems that assist in the effective tracking and monitoring of the programs. This system tracks all programs from project leads to completions. There are also project specific tracking systems. At the beginning of the process, leads are tracked in the tracking system, which carries them all the way through the programs to the rebate processors. It was reported that the CRM tracking system is not designed to easily track customer status within a multi-staged program like Process Efficiency. It was specifically reported that CRM is good for tracking individual projects and pre-approvals, but not customer status within the Process Efficiency flow (e.g., which memorandum of understanding (MOU) is signed). Previous program staff often knew customer status details “in their heads”, and this status information is currently tracked in separate spreadsheets.

Overall, the evaluation team identified the following key findings specifically for the Process Efficiency program, organized by what is working well, and opportunities for improvement or additional research, and synthesized across the Minnesota and Colorado programs.

4.2.1 Program Areas That Are Working Well

- **The program is engaging new customers in the Business DSM portfolio.** Staff report that the program has been successful at recruiting customers who historically have not participated in Xcel Energy programs, indicating the program is filling a niche in the portfolio.
- **The program is encouraging customers to think holistically about energy efficiency.** One of the strengths that were mentioned by several staff is the program’s holistic approach to energy conservation. In accordance with its design, staff believe the program has been successful at getting customers to evaluate how to incorporate energy efficiency into their core business practices and corporate culture, beyond just replacing equipment.
- **In general, staff are positive about the EnVINTA business practices benchmarking tool.** Staff generally expressed positive feedback on the EnVINTA assessment tool. The tool appears to be particularly effective at getting customers to think about energy conservation strategically as part of their business. Staff did raise, however, that there are also other similar tools available on the market that could be investigated as well.
- **The program is succeeding at engaging decision-makers early on in the participation process.** As part of the one-day initial site visit, the program engages company decision-makers from outset, minimizing the risk of drop-offs due to decision-maker barriers.

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- **There is a strong pipeline of future projects in Colorado.** While the program has fallen short of its annual goals the first three years of implementation, the program has built a robust pipeline of projects expected to be completed within the next couple of years.
- **The program delivery roles are well defined: customer marketing, Phase 1 assessments, project tracking, engineering support and analysis (sales engineers versus energy efficiency engineers (EEEs)), and program strategy and refinement.** In Minnesota, the program manager, account managers and sales engineers also seem to have a good understanding of which staff need to attend initial customer meetings (i.e. a flexible approach) to provide sufficient program information and build customer trust. As more staff have recently come on board for the Colorado program, program delivery roles should also be clearly defined.
- **In Minnesota, sales engineers have been an important strategic resource and are making a concerted effort to obtain details for scoped projects and facilitate customer participation.** The recent addition of a sales engineer in Colorado may greatly help the program in that state.

4.2.2 Opportunities For Improvement/Research

- **In Colorado, there is a need to ensure that there are adequate staff resources to effectively implement the program.** Lack of staff resources was mentioned by several staff as one of the most pressing challenges they face. The program recently added a marketing assistant and a sales engineer.
- **There is opportunity to leverage account managers to promote the program to target customers.** Feedback suggests that there is still some hesitancy among some account managers to actively promote the program to their large industrial customers, largely due to staff limitations. While this appears to be more pronounced in Colorado, in Minnesota there are also some account managers who more actively promote the program than others.
- **There is room for improvement within coordination between the implementation contractor and energy efficiency engineering staff.** Both Xcel Energy engineering staff and implementation contractor staff mentioned that coordination between the two groups could be improved, specifically relating to communicating data needs for custom projects.
- **Long project development timelines do not mesh well with annual savings goals, sometimes leading to uneven and rushed scoping and engineering assessments.** This is a consistent issue across all large capital improvement projects and was also found in last year's 2011 evaluation research of the Colorado Self-Direct program. It can be particularly pronounced when there are a smaller number of participants.
- **The holistic approach can be more difficult to understand.** Some account management staff may not be fully supportive of the holistic program focus. Staff also feel some customers struggle to do on-going energy consumption tracking to facilitate longer term investments.

4.3 DETAILED FINDINGS

Xcel Energy's Process Efficiency program in Colorado launched in 2009 following the program's early success in Minnesota. The program's initial design was taken from the existing program in Minnesota, with the exception of the sales engineer role. Since its inception, there have been few substantial changes to the program's design. The most notable change has been the exclusion of natural gas-saving measures, due to the limited number of opportunities in Colorado due to the large number of transport gas customers. The program also just recently added a sales engineer and marketing assistant to the program team.

In each of the program's first three years of implementation (2009 through 2011), the program has fallen short of its internal annual savings goal. Program staff attribute these shortfalls to a number of intervening factors. These factors include pursuing capital-intensive projects with long lead times, projects being pushed back due to the economic downturn, the make-up of the industrial customer base in Colorado, limited staff resources, and struggles leveraging some account manager relationships to promote the program. Also, in Colorado, there is overlap with the Self-Direct Custom program, in both the target market and eligible projects. Yet, staff report that the program has built a strong pipeline and are optimistic about the program's performance over the next couple of years. In addition, the program has been successful at building new relationships with customers, as most participants have not historically participated in other Xcel Energy programs.

Colorado's industrial customer base is more limited than in Minnesota, in both the number of industrial customers and energy consumption. As a result, the target market for the Colorado Process Efficiency program is narrower. Several staff expressed interest in the possibility of expanding eligibility for the program. Feedback from program and account management staff suggest that there may be a pool of targeted customers (e.g. very large commercial customers) who are currently not eligible for the program who could benefit from the technical support provided by the program and could produce cost-effective projects. At the same time, staff acknowledge the balance between opening the program up to customers who could benefit from it and ensuring that participating customers can implement projects with enough energy savings to keep the program cost-effective.

Because of the program's narrow target market, outreach to customers is primarily driven through Xcel Energy account representatives. Program staff agreed that the program has not been able to fully leverage the account management infrastructure to promote the program to customers. Several account managers have been slow to encourage eligible customers to consider participating in the program, although the program has made some recent headway in gaining "buy-in" from more account managers. Feedback suggests that account management has been slow to buy-in largely because of the newness of the program and the level of involvement required.

While Xcel Energy does not directly market the program to trade allies, program staff have made efforts to reach out to vendors working with eligible equipment. One concern expressed by several staff is whether "incumbent" study vendors see the program and its study implementer as a threat to their business. In effort to mitigate this perception, program staff have met with several large engineering study firms and their large industrial customers to discuss the program. The intent of these interactions is to engage vendors as working

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partners opposed to them viewing the program as competition. Staff are hopeful that incumbent vendors can help drive participation instead of being a potential barrier.

Staff generally report strong internal working relationships, both within Xcel Energy and with the program's implementation contractor. Among Xcel Energy staff, team members report close communication on individual projects and positive interactions among program staff and account management.

While staff generally also report effective working relationships with the program's implementation contractor, engineering staff note that communication with the implementation contractor has not always been as good as it could be, particularly relating to communicating data needs for running custom analyses. Sometimes the information supplied to engineering staff is not sufficient to complete a custom analysis and additional information needs to be requested. This feedback was echoed by the implementation contractor staff. Both Xcel Energy and the implementation contractor staff reported that collaboration between the two groups has strengthened over time, but communication could still be improved. In addition, the implementation contractor does not currently have a local presence in Colorado, which was mentioned a potential area for improving working relationships between Xcel Energy and the implementation contractor.

One of the biggest challenges the program has faced is its limited staff resources. Until recently, the program was only staffed by the program manager, an energy efficiency engineer, and a trade relations manager. In comparison, the Minnesota program, while having more participants, has three dedicated sales engineers who play a large role coordinating efforts between the energy efficiency engineers, account managers, and customers. In addition, the Minnesota program team also includes a dedicated marketing assistant. In Colorado, the program manager has had to absorb these responsibilities.

Feedback from staff suggests that the lack of staffing has impacted project timelines and customer outreach efforts. Both program staff and account management staff noted some internal backlogs on some projects due to staffing constraints. Not only do these delays cause longer project lead times, one staff member said internal delay risks the level of customer engagement throughout the participation process. In addition, not having sales engineers has put more work on the shoulders of account managers to carry projects through the program. One account manager in Colorado pointed to this additional responsibility as one of the main reasons why account management staff in Colorado are less likely to actively promote the program to their customers compared to Minnesota.

Finally, several staff noted some other ongoing challenges for the program. One of these challenges is tracking progress toward annual energy savings and budgetary goals; given that Process Efficiency projects typically have lengthy lead times before any energy impacts can be captured. By its design, participation in the program is meant to be a multi-year commitment, even though energy savings and budget targets are set on annual basis. In many cases, the program commits substantial study funding in one program year, even though the program might not be able to claim any energy savings in the same program year. Relatedly, another ongoing challenge is managing risk associated with devoting substantial resources to technical studies without the guarantee of realizing sufficient energy savings to

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be cost-effective (e.g. drop outs, limited opportunities for energy savings). This risk underlines the importance of targeting candidates with potential to achieve substantial savings.

5. EVALUATION RESULTS – PARTICIPANT FINDINGS

This section presents the results of eight telephone surveys of participants conducted as part of the evaluation of the Xcel Energy Process Efficiency program in Colorado.

5.1 INTRODUCTION

The participant surveys collected information to inform program design, program administration, program implementation and delivery, market response, and program attribution.

The participant surveys included questions regarding participant decision-making processes, sources of 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. The evaluation team conducted interviews with participants using a survey guide reviewed by Xcel Energy.

5.1.1 Sample Preparation Process

To develop the sample frame, a census was taken of all eligible participants for the Colorado Process Efficiency program. Tetra Tech received participant tracking data from Xcel Energy, which included participants from program inception. Tetra Tech received several files, including measure-specific and contact information files, which were aggregated and merged together. This data included information on level of program participation, type of measure or process implemented, kWh and kW savings, customer id (an id unique to Process Efficiency), debtor number, and customer address information.

In the measure-specific data file, data were “stacked” by measure type, meaning that each line in the data represented a type of measure installed at a premise or location. In order to prepare the sample for fielding, the data were aggregated so all measure information was combined and attached to one customer id⁶. The energy savings and rebates were characterized overall as well as net-to-gross eligible only (discussed further below).

Based on participation levels, we took a census of all available sample (after removal of one case whose facilities closed and final aggregation, N=19). Based on their phase, stage, and whether they have implemented measures/processes, participants were then categorized into one of the three sample groups below for navigation through the survey:

- “Active Participants” - Completed project/installed energy-efficiency measure(s) for which the program is claiming savings since January 1, 2011, received NTG battery
- “Dormant Participants” - Completed project/installed energy efficient measure(s) prior to January 1, 2011 but have not completed project/installed energy-efficient measure(s)

⁶ This is the variable “Customernumber” in the sample file sent to Xcel Energy.

5. Evaluation Results – Participant Findings

since January 1, 2011 and are not currently participating in a project or study, did not receive NTG battery

- “Partial Participants” - Have not completed any projects/installed energy efficiency measures for which the program is claiming savings, did not receive NTG battery

Only participants who have implemented an energy efficiency measure or process for which the program is claiming savings since January 1, 2011 were asked the net-to-gross (NTG) battery, and those who have implemented measures or processes both before and after January 1, 2011 were asked NTG questions for the measures installed post-January 1, 2011. All measures/processes implemented by participants were categorized as either non-NTG (meaning they will not be asked NTG questions about this measure), or NTG-eligible (meaning they will be asked NTG questions about this measure). Energy savings, rebate, and other measure-related information was also characterized this way.

After discussions with Xcel Energy, it was determined that for cases where the participant had not progressed far in the participation process yet and had not begun their EnVINTA session (N=4), the evaluation team would handle these interviews as brief in-depth interviews instead of quantitative interviews. We were not able to complete interviews with any of these customers.

5.1.2 Data Collection Process

Tetra Tech attempted to reach the Colorado participants over a five-week period and attempted multiple callbacks over this time period. As requested by Xcel Energy, cases that were attempted eight times were removed from the active sample. Bad number lookups were attempted, and Xcel Energy staff also provided alternate phone numbers for these cases. Table 5-1 details the final survey completes by participation type.

Table 5-1. Participation Status of All Cases

Participation Status	Available Sample	Number of Completes
Active Participant	8	4
Dormant Participant	1	1
Partial Participant	10	3
Total	19	8

Collectively, the companies that had completed projects through the program had installed a wide range of measures, including: new efficient motors and variable frequency drives (VFDs), water pumping controls and shutoffs, lighting upgrades, a chiller replacement, compressed air, and a plate and frame heat exchanger.

5.2 KEY FINDINGS

Overall, Xcel Energy's Process Efficiency Program in Colorado appears to be working well, as evidenced by the high satisfaction ratings given by the program participants that were surveyed. Key findings from the participant survey include:

- **Consistent with the program's outreach strategy, program participants learned about the program primarily through their Xcel Energy account manager and by accessing the Xcel Energy website.** The most common means of communication were personal meetings with account managers. Account management staff were also closely involved with each stage of customers' participation.
- **Measure persistence is high.** All customers reported the high efficiency equipment they installed through the program is still installed and operating.
- **The most cited reasons for participating in the program were to save energy and to reduce costs.** Most of the respondents had considered participating in other Xcel Energy offerings as well. While some participated in other programs in addition to Process Efficiency, others only pursued the Process Efficiency option. Those that only pursued the Process Efficiency program reported they primarily did so because of the additional engineering and technical support. Those participating in both either had already begun participating in another program before they knew about Process Efficiency or bundled other program measures with the Process Efficiency program.
- **Most participants reported that the primary barriers to installing efficient equipment are company budget constraints and competing funding priorities.** In this light, the detailed analyses and financial incentives provided through the structured/phased program approach has helped firms to prioritize and justify projects to upper level management.
- **All respondents listed as being in Phase 1 or Phase 2 said they were moving on to the next program phase or planning to do so.** This feedback suggests a strong pipeline for future energy-saving projects through the Process Efficiency program.
- **Interviewees reported high satisfaction with project incentive levels, funding for technical assessments and the program's bonus incentive.** No participants reported receiving lower incentive amounts than originally estimated, and in fact half of respondents said they received more funding than originally estimated. The importance of the incentive is demonstrated by one participant's report of trying to replicate Process Efficiency projects at facilities outside of Xcel Energy's territory, but not being able to gain approval because of the lack of incentive to increase the return on investment.
- **Program satisfaction is very high.** In particular, participants value the funding provided for technical assessments and the end-product provided. Another primary benefit of the program is the reduced demand for energy after their projects are installed.
- **Feedback from participants indicates that the program has impacted the role of energy conservation in core business practices.** Half the interviewed firms said their participation in the program resulted in written energy plans and policies. Those who already had plans in place prior to the program reported an increase, improvement or

5. Evaluation Results – Participant Findings

acceleration in the previous energy plans. Firms are taking a wide variety of steps to more actively monitor energy use after initial participation including formally staffing new roles, metering additional equipment/facilities and monitoring energy use in real-time.

- **There are few suggestions for changes to the program.** When asked for suggestions of how to improve the program, six out of eight respondents had no recommendations. Suggestions for changes included expanding program eligibility, devoting more resources to services currently provided by the program's implementation contractor, and using a local implementation contractor.

5.3 DETAILED FINDINGS

Detailed findings are presented in the following topic areas: program awareness, participation factors, program design and procedures, program satisfaction, and company policy and tracking changes.

5.3.1 Program Awareness

Program participants learned about the program primarily through their Xcel Energy account manager (see Table 5-2 below). Most often this was via in person meetings, emails, or phone calls. The Xcel Energy website was utilized to find out about the program by half of our interviewees.

Table 5-2. Program Awareness

How Participant Learned of Program	Total (n = 8)
Xcel Energy Account Manager	6
Personal meeting with account manager	6 of 6
Received an email from account manager	4 of 6
Made or received a phone call with account manager	3 of 6
Information in mail from account manager	1 of 6
Xcel Energy Website	4
Xcel Energy Event	3
Another Xcel Energy Staff Manager	2
Personal meeting with Xcel Energy staff member	2 of 2
Received an email from Xcel Energy staff member	2 of 2
Made a phone call to Xcel Energy staff member	2 of 2
Received a phone call from Xcel Energy staff member	1 of 2
Information in mail from Xcel Energy staff member	1 of 2
Previous Experience with an Xcel Energy Program	1
Other (EPA, engineer)	2

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Source: Participant Survey, questions PA1a and PA1

5.3.2 Participation Factors

Of the eight respondents, six had considered participating in other Xcel Energy offerings including prescriptive or custom rebates. Three of these respondents eventually participated in these other programs in addition to Process Efficiency, while two only pursued the Process Efficiency option. Those that only pursued the Process Efficiency program did so because they valued the structure of the program, and were able to get management support due to the additional engineering and technical support.⁷ Those that were participating in other offerings had either already begun participating in a program before they knew about Process Efficiency or they were able to bundle their efforts (retro commissioning, prescriptive rebates) with the Process Efficiency program.

All of the four participants that had installed projects since January 1, 2011 stated that their participation in the program had “a significant influence” on their project plans. When asked to elaborate on how the program affected their installation plans, these four respondents noted that:

- *“The assessment that was performed looked at a more detailed level than we would have done with internal staff. They looked at motors, building, processes, and broke them down into their individual components, looking at return on investment for specific pieces of equipment instead of on a plant-wide level.”*
- *“It was significant in the decision making because it allowed us to verify with upper management the payback associated with investment. It allowed us to incorporate additional projects with the rebates we received, and it helped us, and continues to help us achieve, our go-green corporate goals.”*
- *“The information that was provided by Xcel [Energy] gave some good guidelines for equipment selection, so using those we made our purchase selections. It gave us some broader insight into the purchase of that type of equipment.”*
- *“I think it gave us the impetus to search out for many opportunities that would be there by providing incentives to do the projects.”*

More detailed implementation decision/attribution information is presented in Section 9.

When asked *why* they implemented their project measures, three of these four respondents noted that they wanted to save energy and reduce energy costs; one respondent noted the program incentives explicitly. In addition, two of the respondents cited environmental goals

⁷ In addition, as part of the 2011 evaluation of the Colorado Self Direct program, the evaluation team interviewed a Process Efficiency participant as a non-participant. This customer reported choosing the Process Efficiency program over the Self-Direct program because their engineering staff did not have sufficient time or resources for the Self-Direct Program and appreciated the Process Efficiency engineering support.

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(e.g., corporate “green” goals, reducing carbon output to be a good corporate citizen), while two mentioned attractive return-on-investment (ROI) through the program. The one respondent that had received a bonus rated the importance of the bonus as a “ten” on a scale from zero (lowest) to ten (highest).

Four respondents said they faced specific barriers when deciding whether or not to implement their projects; the following barriers were each mentioned by one respondent:

- Other priorities for capital spending
- Lack of investment funds
- Difficulty disrupting critical, 24/7 operations
- Regular difficulties convincing financial decision makers

Two respondents stated that the program rebates directly addressed company budget constraints, while two noted that Xcel Energy’s savings documentation validated their own internal return on investment analyses for complex, long-life projects. One respondent said that Xcel Energy’s project endorsements provided valuable “energy conservation credibility” to internal staff, while another noted how the program offered a structured approach to arrive at realistic energy savings and secure financial assistance.

Since their initial participation in the Process Efficiency program, five participants reported having implemented additional projects without financial assistance from Xcel Energy, shown in Table 5-3. The most common reason for not implementing these projects through the program was that the project would not qualify, either because of the type of improvement or the payback period was too low. One respondent said the old equipment was in need of quick replacement and their company knew little about the program at that point in time.

Table 5-3. Additional Projects Installed After Process Efficiency Participation

Project Type	Number of Responses (n=5)
High efficiency lighting equipment	4
Lighting controls, occupancy sensors or time clocks	3
High efficiency cooling equipment	1
High efficiency heating equipment	1
Controls to heating, ventilation or AC systems to reduce use	1
High efficiency motors or drives	2
High efficiency refrigeration equipment	1
Energy management systems	1
Chilled water optimization	1
Flat plate heat exchange improvement	1
Recommissioning study	1
Water plant SCADA controls	1
Water plant butterfly valve	1

Source: Participant Survey, question S6

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All six respondents listed in the program tracking data as being in Phase 1 or Phase 2 said they were moving on to the next program phase or planning to do so. One respondent noted that they were still prioritizing projects for their next memorandum of understanding and focusing on projects with the fastest payback, and potentially deferring upgrades for equipment with several years of remaining life. Another respondent said that they would proceed after synthesizing multiple project assessment reports from consultants, the implementation contractor and internal staff and then developing preliminary budgets and schedules.

5.3.3 Program Design and Procedures

Table 5-4 shows how different program actors were involved in the different program stages. Feedback from participants indicates that Xcel Energy account managers are most involved in the early benchmarking stage, and are also providing assistance with the technical assessments and securing rebates. Xcel Energy program management staff are also involved in the benchmarking stage and sometimes stay involved in the assessments stage too. Notably, most respondents indicated that multiple company staff were involved in the early benchmarking stage.

Table 5-4. Program Actors' Involvement in Participation Stages

Actors	Business Benchmarking (n = 8)	Technical Assessment (n = 8)	Improvements Implementation (n = 5)	Rebate Application (n = 5)
Xcel Energy Account Manager	6	4	2	4
Other Xcel Energy Program Staff	6	3	1	1
The Program Implementation Contractor	7	7	1	0
Study Provider	0	0	0	0
Equipment Vendor/Contractor	0	0	3	1
Respondent	6	5	2	2
Someone Else at Participant Company	7	5	4	3
Consultant	1	0	0	0

Source: Participant Survey, question SA1B

All customers reported the high efficiency equipment they installed through the program is still installed and operating.

One of the two respondents that tried to complete the rebate application required assistance from their account manager, noting that the account manager completed most of the application after they submitted relevant project data.

When asked why they selected their specific installation contractors, the five respondents that had completed projects gave a range of answers:

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- The contractor had previous experience with an Xcel Energy program
- The contractor was on their company's approved list and had a positive performance record
- The contractor had done the scoping study and gave a (reasonable) price quote
- The contractor was the lowest bidder in a competitive solicitation
- The contractor had a long service history with the company and experience with the specific type of (electrical) project

Going forward, three respondents said they would prefer to reference a list of experienced/qualified contractors provided by Xcel Energy, while two would prefer to choose from all contractors in the market.

Five respondents indicated that their account managers estimated the amount of Xcel Energy funding they would receive for their technical assessments, while three respondents received information from other program staff, and one estimated Xcel Energy's contribution themselves. Regarding the accuracy of these initial estimates, four respondents received more funding than expected, two received the same amount and two could not recall.

Among the four respondents that had received rebates through the program, three were given rebate estimates from their account managers, two received information from other program staff, and one estimated the rebate amounts themselves. Regarding the accuracy of these initial rebate estimates, two respondents received higher rebates than expected, one received the same amount and one could not recall. Three rebates recipients indicated that that rebates were part of their capital spending plans to get projects approved, and on a scale of zero to ten, the average importance of the program rebates was 7.7.

Regarding the energy savings estimates they received during the final rebates calculations, two respondents said these were the same as initially estimated, while three could not recall the initial savings estimates and make this comparison.

On a zero to ten (with ten being very satisfied) scale, average satisfaction with the Process Efficiency program was 9.25. Half of the respondents rated their satisfaction at a perfect ten. This rating is higher than the average satisfaction of Xcel Energy overall, which was given an average of 8.75 on the same zero to ten scale. The small difference in ratings is due to positive opinions of the Process Efficiency program opposed to negative feelings about Xcel Energy. Below are quotes that demonstrate this praise:

- *"I think that it's a great value, the scale of Process Efficiency is something we couldn't find with other programs, as far as the amount of technical assistance we could use for something so industry specific and such a big part of our energy usage."*
- *"We were able to streamline the rebate process, so now with the Process Efficiency, a lot is done with the engineering studies and the estimates come out of it. We are able to capture more in the rebates than we initially thought."*

When asked about any aspects of the program that the respondent might want to change, four out of six interviewees said that they had no change to recommend or that they did not know what they would alter. One respondent said he/she would like to see program eligibility

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expanded to include some of their other large accounts that currently do not qualify for the program. In addition, the respondent thinks that the program's implementation contractor is overstretched and that he/she would like to see more resources devoted to the implementation contractor or another vendor brought in to "handle the volume of work and keep up in a timely manner". The other respondent who offered a recommendation said he/she would like "a local provider", presumably referring to the implementation contractor.

In order to distinguish between the variety of program components valued by respondents, they were asked (using the same zero to ten scale) how satisfied they were with certain program elements. The sample sizes differed for each program element, reflecting their different participation stages. As seen in Table 5-5 below, the average ratings range from 7.4 to ten. The most valued program components include the bonus offering, funding for the technical assessment, the installation contractor, and the amount of the rebate. The least valued component was the benchmarking against similar sized facilities; however the high scores indicate value across all the program components.

Table 5-5. Satisfaction with Various Program Components

Program Aspect	Mean	n
The amount of the bonus received	10.0	1
The funding amount the program provided for the Phase 2 technical assessment	9.4	7
The contractor who installed the equipment or implemented the measure	9.4	5
The amount of the rebate	9.3	3
Requirements for energy efficient project rebate eligibility	9.1	8
The program's handling of questions or complaints	9.1	8
The program information received from Xcel Energy	9.1	8
The Phase 2 technical assessment and analysis done to identify and scope potential energy savings measures or processes	9.0	8
The level of communication or engagement of Xcel Energy staff and their subcontractors	8.9	8
The type of equipment or improvements eligible for the program	8.8	8
The quality/action ability of the stud(ies) performed in identifying energy improvements	8.8	8
The amount of time it took to receive the rebate	8.7	3
The information and discussion provided by the free one-day business practice benchmarking session	8.7	6
The rebate application process in general	8.6	5
The amount of energy savings seen since the project completed	8.5	4
Technical assistance provided by Xcel Energy or their vendor to assist with energy efficiency projects	8.5	8
Benchmark energy usage information that compared your facility to other similar facilities	7.4	8

Source: Participant Survey, questions SA6a to SA6q

When all respondents were asked about what they believed to be the most helpful form of program assistance, half of the respondents agreed that the technical assessment to identify energy saving opportunities is particularly valuable. Singular responses regarding helpful program aspects include:

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- Establishing goals and timelines
- Open communication with Xcel Energy representatives
- In-depth analysis of top consuming equipment
- Verification of collected data's accuracy
- Funding to conduct technical assessment
- Business practices benchmarking

The most common benefits realized by interviewed participants related to reduced energy impacts: reduced energy consumption (four respondents), improved efficiency (two respondents), and reduced energy costs (two respondents). In addition, most participants stated that their company staff understanding of energy processes and/or engagement in energy conservation had increased. One respondent noted an increase in positive public relations and higher customer satisfaction, while another noted reduced environmental impacts.

5.3.4 Conservation Policies and Goals Tracking

We asked participants about their conservation policies, goals, and tracking systems before and after their program participation. Before the program, three of our eight respondents had policies and goals in place, and after their participation, this number doubled to six firms with written energy policies and goals.

The group that had policies and goals in place before they participated in Process Efficiency also tracked progress towards goals set forth in these policies. Two of these companies had defined strategies for achieving goals written into their policy. Specific goals included:

- Reduce the company's carbon footprint by 25 percent over a five-year period.
- Reduce electric usage by ten percent compared to a 2008 baseline.

After their program participation, some aspects of their policies have changed. For the first firm's goal listed above, the five-year period has passed and they have a new goal to have a zero percent increase in electricity usage this year. The second firm credits any changes in their goals due to the recent creation of a new staff position to focus full time on energy management. The third firm (which did not describe its initial goals) noted that they have decided to accelerate their goals after participating in the program. Additional changes made by these three firms include use of online energy monitoring tools, sub-metering equipment, and focusing on new areas that they overlooked in their earlier policies (details not provided).

Each of the six firms that we spoke with who now have energy plans or policies have tracking mechanisms set in place. Popular tracking metrics among our interviewees includes yearly or monthly changes in energy demand, process improvements, equipment substitutions, and kW consumption normalized to the cost of goods sold.

Four of the respondents believed that their company's energy efficiency efforts will be "very sustainable", while one said their efforts would be "pretty sustainable" and another thought they would be "extremely sustainable – a ten out of ten."

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Two respondents had implemented additional recommendations from the EnVINTA kick-off sessions. One company was completing a comprehensive lighting upgrade (with fluorescents, halides and possibly LEDs), and the other company developed a new business initiative that identified key players in the organization to formally track and manage energy usage. This company developed an energy use database to track energy use for all accounts and is developing metrics to compare energy use across facilities.

These two companies had also changed their general business practices: one is keeping less equipment “online” at all times, and the other is trying to shift more operations to off-peak periods. A third respondent reported that they are trying to replicate some of their Process Efficiency projects at other facilities outside of Xcel Energy territory, but is facing management resistance because no utility financial assistance is available.

Among the five respondents that could not list additional projects, two were not involved in the Phase 1 EnVINTA session and were not familiar with the recommendations, two said they had implemented all of the recommendations, and one perceived that corporate management was less interested in high-level, organizational energy management than specific projects.

5.4 CONCLUSION

Overall, program participants are very satisfied with the performance of the Process Efficiency Program in Colorado and with Xcel Energy in general. Respondents reported a high level of satisfaction with the program funding for technical assessments and scoping studies, the rebate amounts, interactions with Xcel Energy program staff, and detailed project analyses afforded by the program. In particular, the program has been valuable in helping company staff to justify energy efficiency upgrades and capital spending to upper management by providing formal energy savings estimates and demonstrating favorable return on investment.

6. EVALUATION RESULTS – NONPARTICIPANT FINDINGS

This section presents the results of six telephone surveys of program nonparticipants in Colorado conducted for the Xcel Energy Colorado Process Efficiency program evaluation.

6.1 INTRODUCTION

The primary objectives of the nonparticipant survey were to understand program awareness, business practices and policies relating to energy conservation, decision-making factors, relationships and satisfaction with Xcel Energy, and the characteristics among industrial customers who have sufficient consumption levels to participate in the Colorado Process Efficiency program, but have not yet done so. In addition, the nonparticipant survey also sought to examine many of these same characteristics among industrial customers with lower consumption to inform the feasibility of broadening program eligibility. These interviews were conducted from July 3 to July 27, 2012.

6.1.1 Sample Preparation Process

Currently, the Process Efficiency program is limited to industrial customers with a minimum of two GWh of energy savings potential. Customers typically need to consume at least 20 GWh annually to meet this threshold. The sampling frame for the nonparticipant survey effort included customers who are likely eligible for the program (20 GWh annual consumption and above), as well as customers who are likely not currently eligible for the program (between six and 20 GWh annual consumption) in order to learn about possibilities in expanding the reach of the program to smaller customers.

Tetra Tech aggregated nonparticipant data provided by Xcel Energy to the customer level, resulting in 57 customers in the initial sample frame. These customers were then reviewed by Xcel Energy to identify business types ineligible for the program and “Do Not Call” cases (11 customers), which resulted in a final sample frame of 46 customers. Customers were then categorized as either currently “eligible” or “ineligible” for the Process Efficiency program, based on their aggregated annual consumption. A census sample was then taken.

6.1.2 Data Collection Process

Tetra Tech attempted to reach the Colorado participants over a four-week period and attempted multiple callbacks over this time period. As requested by Xcel Energy, cases that were attempted eight times were removed from the active sample. These cases accounted for 50 percent of all customers we were unable to survey (20 of 40). Tetra Tech attempted lookups for bad phone numbers, which represented 35 percent of customers we were unable to survey (14 of 40). Overall, we were able to complete six surveys with nonparticipating customers. Table 6-1 details the final survey completes by program eligibility status. The three ineligible customers surveyed had annual consumption of 6.7 GWh, 10.0 GWh, and 11.1 GWh, respectively.

Table 6-1. Summary of Sampled and Surveyed Nonparticipants

Annual Consumption	Number of Customers in Sample	Number of Completed Surveys
6 GWh to less than 20 GWh (not currently eligible for program)	31	3
20 GWh or greater (eligible for program)	15	3
Total	46	6

6.2 KEY FINDINGS

We spoke with customers in a variety of different industries. Primary building activities of eligible customers surveyed included plastic container manufacturing, food processing, and office/professional. Among ineligible customers, primary building activities included corrugated packaging manufacturing, agricultural barns, and offices/labs. Below are key findings from the nonparticipant surveys.

- **Not all eligible nonparticipants are aware of the Process Efficiency program.** Only one of the three eligible nonparticipants surveyed said they had heard of the Process Efficiency program. This customer learned about the program via email from their Xcel Energy account representative and reported that the information they received from their account representative was sufficient to know how to participate in the program.
- **Feedback suggests customers look to their Xcel Energy account representatives as trusted sources for information on energy efficiency.** Among nonparticipants surveyed, the most commonly sought out sources for information on implementing energy efficient equipment or processes are the company's Xcel Energy account representative and vendor/contractors (each mentioned by three respondents). Two of the three respondents who mentioned their account representative were eligible nonparticipants. This finding is consistent with the Process Efficiency program's outreach strategy of leveraging account manager relationships.
- **Nonparticipants reported slightly lower satisfaction with Xcel Energy compared to program participants, suggesting that the Process Efficiency program may be having a positive effect on customer satisfaction with Xcel Energy overall.** On average, nonparticipants rated their satisfaction with Xcel Energy overall 8.3 out of ten, with zero being very dissatisfied and ten being very satisfied. Comparing these results to the participant survey, the average satisfaction rating of Xcel Energy overall was 8.8 among participating customers, slightly higher than nonparticipants. Participants also reported very high satisfaction ratings with the Process Efficiency program specifically, providing further evidence that the program may be increasing customer satisfaction.
- **Feedback from respondents suggests that the assistance and support offered by the Process Efficiency program is well designed to address the needs of industrial customers.** Nonparticipants rated compatibility with existing equipment or processes as the most important factor when considering installing new equipment or processes,

6. Evaluation Results – Nonparticipant Findings

followed by performance and life-cycle costs. Respondents also mentioned lack of knowledge about energy savings opportunities and uncertainty regarding return on investment as key barriers to implementing energy efficiency improvements. These findings underline the value of the technical and business practice support a program like Process Efficiency offers. In addition, most of the businesses surveyed strive for payback periods of less than four years, and capital budget constraints were the most commonly mentioned barrier to implementing energy efficient improvements. This feedback highlights the importance Xcel Energy rebates in helping to make energy efficient improvements feasible.

- **Eligible customers report both a high level of interest in the Process Efficiency program and several opportunities for energy efficiency improvements.** All three eligible nonparticipants expressed interest in participating in the Process Efficiency program in the future and are considering implementing additional energy efficiency actions in the next three years. Planned improvements include lighting controls, HVAC equipment, building envelope improvements, and site assessments or studies.
- **Feedback from currently ineligible nonparticipants shows some potential for growth.** All three nonparticipants surveyed who would not likely be eligible for the program based on their annual consumption reported having recently implemented energy efficiency improvements, and only one of these customers recently participated in an Xcel Energy program. In addition, two of these customers have additional plans for energy efficiency improvements in the next three years. All three of these customers do; however, have considerably lower annual electric consumption than the current 20 GWh threshold, which may limit the energy savings potential for these customers.

6.3 DETAILED FINDINGS

Detailed findings are presented in the following topic areas: program awareness and interaction, decision making factors, energy efficiency actions and plans, and satisfaction.

6.3.1 Program Awareness and Interaction

All nonparticipants surveyed were aware that Xcel Energy offers rebate and technical assistance programs to assist customers in making energy saving improvements. Two of the six respondents (one eligible customer and one ineligible customer) reported recently participating in an Xcel Energy energy efficiency program. One respondent said they participated in both prescriptive and custom rebate programs, while the other said they participated specifically in the Motors and Drives Efficiency program. Three of the six respondents (one eligible customer and two ineligible customers) reported having a rebate application denied by Xcel Energy because the equipment they purchased did not qualify (equipment included lighting, chillers, and a motor).

Only one of the three eligible nonparticipants surveyed said they had heard of the Process Efficiency program specifically prior to the interview. This customer learned about the program via email from their Xcel Energy account representative and reported that the information they received from their account representative was sufficient to know how to

6. Evaluation Results – Nonparticipant Findings

participate in the program. He/she indicated that they would be interested in participating in the program in the future (giving nine out of ten rating, with zero being not all interested and ten being very interested). When asked what additional information, assistance, or clarification they would need in order to participate in the program, the respondent said, “I would actually like to have Xcel Energy come out [and visit]”.

The two eligible nonparticipants who had not heard about the Process Efficiency program both also expressed interest in participating in the future (giving eight and ten out of ten ratings, respectively). One respondent said he/she would like “some written documentation on how [the program] works,” while the other said they regularly communicate with their Xcel Energy account representative about current energy efficiency offerings available to them.

6.3.2 Decision Making Factors

Among all nonparticipants surveyed, the most commonly sought out sources for information on energy efficient equipment or processes are the company’s Xcel Energy account representative (two eligible respondents and one ineligible respondent) and vendor/contractors (two ineligible respondents and one eligible respondent). Other sources mentioned include Xcel Energy’s Business Solutions Center (two respondents), internet searches (two respondents), engineering staff (one respondent), and advertising campaigns (one respondent).

As shown in Table 6-2, nonparticipants rated compatibility with existing equipment or processes as the most important factor when considering installing new equipment or processes, followed by performance and life-cycle costs. Availability of a program rebate and rebate amounts were rated relatively low in importance compared to other factors mentioned, including life-cycle costs, return on investment, equipment compatibility, and energy savings. This finding underscores the value of the technical and business practice support a program like Process Efficiency offers in addition to rebates for energy efficient equipment.

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Table 6-2. Importance of Factors when Considering New Equipment or Processes

Decision-making Factor	Respondents Rating 8 or higher (0 - not at all important, 10 - very important)	Mean Importance Rating
Compatibility with existing equipment or processes	6 of 6	9.2
Performance concerns	5 of 6	9.0
Life-cycle costs*	4 of 5	9.0
Return on investment or ROI	6 of 6	8.8
Capital investment or budget availability	5 of 6	8.8
Operating cost	6 of 6	8.7
Efficiency level of new equipment	5 of 6	8.7
Length of payback period	4 of 6	8.5
Money and energy savings	5 of 6	8.5
Initial purchase cost	6 of 6	8.3
Environmental concerns	3 of 6	8.3
Life of new equipment	3 of 6	8.2
Age or condition of existing equipment	2 of 6	7.5
Recommendation of utility	2 of 6	7.3
Availability of program rebate	3 of 6	7.2
Recommendation of contractor or supplier	3 of 6	7.2
If new equipment is readily available	2 of 6	7.2
Amount of program rebate	2 of 6	7.0
Other consideration	1 of 1	10.0
* Don't know responses are excluded (n=1)		

Source: Nonparticipant Survey, question 11

The most frequently mentioned barrier to implementing energy efficiency improvements was lack of capital budget (mentioned by four respondents). Other barriers mentioned include lack of awareness or knowledge about energy and money saving opportunities (two respondents), and uncertainty regarding return on investment (one respondent).

We also asked nonparticipants about their company's energy conservation policies and goals to better understand their decision-making processes. All nonparticipants surveyed except one ineligible customer indicated that their company has a multi-year energy management plan in place with goals for reducing operational energy costs; however, none were able to give the specific savings goals of their energy management plan. Also, two of the six respondents (both eligible customers) reported that their company's policy mandates the purchase of energy efficient equipment. In comparison, three of the eight program participants surveyed had energy conservation plans in place prior to participating in the

6. Evaluation Results – Nonparticipant Findings

Process Efficiency program and two of these reported changing their plans or savings goals as a result of their participation.

Four of the six respondents said their business includes energy conservation improvements in their capital budget plans. All but one respondent said their company strives for payback periods of less than four years. This feedback is consistent with reports from trade allies working the program and demonstrates the role of Xcel Energy rebates in capital spending approval for energy efficiency projects, even if the availability of a rebate is the most important factor when deciding to purchase new equipment.

6.3.3 Energy Efficiency Actions and Plans

We asked all nonparticipants about their recent energy efficiency actions as well as their plans for the future. Among the three eligible nonparticipants, one reported adding lighting controls and implementing recommissioning while another reported installing energy efficient lighting in the past three years. It is unclear whether these specific actions were implemented through an Xcel Energy program; however, one customer reported having recently participated in both prescriptive and custom Xcel Energy programs. In addition, all three eligible customers said they had participated in an Xcel Energy on-site assessment or study in the past three years.

All three of the currently ineligible customers reported having implemented energy efficient improvements in their facilities in the last two years. Installations in the last two years included lighting equipment, motors, variable-speed drives, lighting controls, and HVAC controls. One of these three currently ineligible respondents reported participating in Xcel Energy's Motor and Drive Efficiency program. Two ineligible nonparticipants also reported taking additional energy efficiency actions within the past three years, including making process improvements (both respondents), participating in an Xcel Energy on-site assessment or study (both respondents), installing lighting equipment (one respondent), and making building envelope changes (one respondent).

One of the original objectives of the nonparticipant survey was to assess why eligible customers have participated in other Xcel Energy offerings instead of the Process Efficiency program. The only eligible nonparticipant who reported recently participating in Xcel Energy programs was not aware of the Process Efficiency program before we mentioned it during the interview.

When asked what additional energy efficiency actions they are considering implementing in the next three years, all eligible customers and two of the three ineligible customers reported at least one action. Planned improvements include high efficiency lighting, lighting controls, HVAC equipment, building envelope improvements, and additional studies or technical assessments.

6.3.4 Satisfaction

We asked both eligible and ineligible respondents about their satisfaction with the program offerings available from Xcel Energy and their satisfaction with Xcel Energy overall as their utility provider. Respondents generally indicated that they were satisfied with Xcel Energy and

6. Evaluation Results – Nonparticipant Findings

their energy efficiency program offerings. On average, nonparticipants rated their satisfaction with Xcel Energy overall 8.3 out of ten, with zero being very dissatisfied and ten being very satisfied. One customer offered some additional feedback, commenting “The difference in [Xcel Energy] versus one across the country is the [account] representatives, they are all great. They are just fantastic. Knowledge is information, and the information is regarding the services we buy, which is energy.”

Comparing these results to the participant survey, the average satisfaction rating of Xcel Energy overall was 8.8 among participating customers, slightly higher than nonparticipants. This comparison, coupled with the very high satisfaction ratings from participants with Process Efficiency program, suggest that participation in the program likely has positive affect on customer satisfaction with Xcel Energy overall.

Only one nonparticipant (an eligible customer) rated any of the Xcel Energy program offerings below a five, rating their satisfaction with the level of technical support and information available to them a four out of ten. When asked why the respondent gave this rating, he/she commented that they have not received much technical information from their account representative and it is difficult for them to find someone with more technical expertise.

Table 6-3. Nonparticipant Satisfaction Ratings

Xcel Energy Program Offerings	Respondents Rating 6 or higher (0 - very dissatisfied, 10 - very satisfied)	Mean Satisfaction Rating
Requirements for rebate eligibility*	5 of 5	7.6
Information received from Xcel Energy about programs	6 of 6	7.5
Type of rebated equipment or improvements available	6 of 6	7.3
Amount of rebates offered	6 of 6	7.3
Level of technical support and information available	5 of 6	7.3
Xcel Energy overall	6 of 6	8.3

* Don't know responses are excluded (n=1)

Source: Nonparticipant Survey, questions SA6 and SA8

When asked, “considering the price you pay relative to the quality of the products and services you receive, how would you rate Xcel Energy’s overall value?,” all respondents gave a rating of seven or higher on scale of zero to ten, with zero being “very poor value” and ten being “very good value”. The average rating was 8.2 out of ten, compared to 8.3 among participants of the Process Efficiency program.

6.4 CONCLUSION

Results from the nonparticipant survey provide supporting evidence that the Process Efficiency program is designed to address the barriers faced by industrial customers. The largest barrier to participation among eligible nonparticipants surveyed appears to be awareness of and knowledge about the program. Eligible respondents expressed interest in the Process Efficiency program and are considering several energy efficiency projects in their facilities. Feedback from ineligible nonparticipants suggests that they may be opportunities for expanding the Process Efficiency to a wider range of customers.

7. EVALUATION RESULTS – TRADE ALLY FINDINGS

This section presents the results of six qualitative trade ally interviews conducted as part of the evaluation of the Xcel Energy Process Efficiency program in Colorado.

7.1 INTRODUCTION

The evaluation team conducted interviews with six trade ally contacts using a semi-structured in-depth interview guide approved by Xcel Energy. Xcel Energy provided contact information for seven trade partners who have had some involvement with the Process Efficiency program. The vendor data included contact information as well as notes on each contact's relationship with the program. The majority of the trade partners were third-party vendors who have conducted secondary technical assessments studies for participating customers as part of the Phase 2 scoping process. Several of these secondary study providers also implemented projects rebated through the program.

Interviews were conducted over a three-week period in May and June 2012. This research with vendors provided meaningful process insights into the program's operations, their interactions with the program, their relationships with Xcel Energy, and how the program is serving the industrial market in Colorado. The interviews focused on the following researchable issues:

- How did participating trade partners become involved with the Process Efficiency program? What is the extent of their relationship with Xcel Energy?
- What level of understanding do trade partners have of the Process Efficiency program? Do trades want any additional information or support from Xcel Energy?
- Do trade partners regularly communicate Xcel Energy program offerings to their customers? What are they telling their customers?
- How satisfied are trade partners with communications about the program? Are study expectations clearly understood between Xcel Energy, the program's implementation contractor, and secondary study providers? Are any changes needed?
- Are eligibility requirements optimal? Is the program missing any customer segments or cost-effective project types due to eligibility issues?
- How do secondary study providers perceive the Process Efficiency program? Is the program seen as more a partner or a threat to their business?
- How receptive are industrial customers towards energy efficiency measures given the current economic conditions? Where do trade partners see the industrial market for energy efficiency heading?
- Based on their experiences with other utility programs, do trade partners have any suggestions or lessons learned for Xcel Energy?

7. Evaluation Results – Trade Ally Findings

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

7.2 KEY FINDINGS

Interviewees consisted of compressed air specialists, lighting specialists, and comprehensive energy service companies. Three of the six interviewees indicated that their core business is providing energy efficiency engineering or consulting services to commercial and industrial customers. Two other interviewees reported providing a mix of consultation services and installation of energy efficient equipment and controls. The final interviewee implements lighting efficiency programs and provides ad-hoc lighting consultation services⁸. Trades reported working with mostly existing facilities; only two interviewees reported substantial work in the new construction market. All but one interviewee who specializes in the industrial sector reported working with both commercial and industrial customers.

Below are a few key findings from interviews with trade partners of the Process Efficiency program in Colorado.

- **Trades agree that the Process Efficiency program is well designed to meet the challenges faced by industrial customers and is operating effectively.** Interviewees reported several strengths of the Process Efficiency program, including the ability to engage key decision-makers from the outset, the program's holistic approach, phased delivery, and Xcel Energy's project management capabilities. Interviewees with experience with other utility programs serving industrial customers regard Xcel Energy's Process Efficiency program as best in class.
- **Most participating trade partners became involved with the Process Efficiency program through their existing relationship with Xcel Energy.** All but one of the interviewees contracted with Xcel Energy, the program's implementation contractor, or a participating customer to perform work through the Process Efficiency program. Trades report initially hearing about the Process Efficiency program through their involvement with other Xcel Energy program, discussions with account managers and through trade presentations by Xcel Energy staff.
- **Trades unanimously report positive interactions with Xcel Energy and the implementation contractor staff.** Interviewees report that program staff were accessible, communicated effectively with both them and their customers, and were committed to making sure as many study recommendations were implemented as possible. Most (but not all) secondary study providers indicated that expectations for their involvement were clearly communicated by Xcel Energy.
- **Participating trade partners generally have a basic knowledge of how the Process Efficiency program works, but few know the details of the overall customer participation process.** Interviewees generally had limited knowledge about Process

⁸ This trade is currently contracted by Xcel Energy as an implementer of the Small Business Lighting program in Colorado.

Efficiency program operations beyond their own individual role in projects. One study provider expressed interest in learning more about the program.

- **Feedback from secondary study providers suggests that the Process Efficiency program has been more complementary to their business than competition.** Interviewees who commented perceive the program as more a vehicle to provide more comprehensive services to their customers, opposed to a direct threat to their business.
- **Trades routinely inform their customers about Xcel Energy incentives and offerings that are best suited for the customer; generally trades do not actively promote the Process Efficiency program specifically.** Evaluators assert this degree of trade promotion of the program is appropriate given the program's eligibility requirements and marketing strategy.
- **Initial feedback suggests that the current eligibility requirements are capturing the most suitable targets for the program; however, there may be some missed opportunities.** The general consensus among interviewees is that large industrial customers are best suited for the holistic design of the Process Efficiency program. One interviewee commented that there may also be some large commercial customers, especially those with campuses housing multiple facilities, who might be good candidates for a program like Process Efficiency.
- **Trades are generally optimistic about the potential for energy efficiency in the industrial market.** Even though Colorado's industrial market is narrow in terms of number of customers, trades believe there is a sustainable pipeline of energy efficiency opportunities among industrial customers, who are continually looking for ways to optimize their production processes.

7.3 DETAILED FINDINGS

Detailed findings are presented in the following topic areas: program awareness and involvement, interactions with program staff, program design and procedures, customer interactions, and the industrial market.

7.3.1 Program Awareness and Involvement

All but one of the interviewees contracted with Xcel Energy, the program's implementation contractor, or a participating customer to perform work through the Process Efficiency program. All of these trades performed secondary energy assessments as part of Phase 2 scoping studies, with their deliverable being a formal study report with recommendations for retrofit opportunities. A couple of interviewees also implemented energy efficiency projects resulting from scoping studies through the program. Most of the trades have only been involved with one project through the program. One interviewee did not contract with the Process Efficiency program directly; however, he/she worked alongside the program providing energy assessment services in conjunction with Xcel Energy for a participating customer.

Interviewees report initially hearing about the Process Efficiency program through their involvement with other Xcel Energy programs, discussions with account managers, and

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through trade presentations by Xcel Energy staff. In most cases, interviewees reported being contacted by Xcel Energy, the implementation contractor, or the participating customer directly asking them to provide services for the program. A couple of interviewees indicated that Xcel Energy recommended them to either the implementation contractor or the participating customer, who then contacted them directly.

Trades generally had limited knowledge about Process Efficiency program operations beyond their own individual role. Several interviewees mentioned having a basic understanding of eligibility requirements how the program works, but that they were not well informed on the specific details of the entire customer participation process. One study provider expressed interest in learning more about the program; more for his/her own personal interest than for professional development.

All trades report having participated in other custom and/or prescriptive Xcel Energy programs in addition to the Process Efficiency program. With the exception of one study provider, everyone had an existing relationship with Xcel Energy's energy efficiency programs prior to becoming involved with the Process Efficiency program. One lighting vender said that up to 60 percent of their entire business goes through some type of Xcel Energy energy efficiency program.

In addition to Xcel Energy's Process Efficiency program, three of the six trades reported also working with other utility programs serving industrial customers. Specific utilities mentioned include National Grid (Massachusetts and New York), Southern California Edison (California), and Black Hills Energy (Colorado). None of the trades had any recommendations for Xcel Energy based on their experiences participating in other utility programs. In comparing Xcel Energy's Process Efficiency program to other utilities, one interviewee said, *"I've worked with other utilities and I don't think anyone else has a better program"*. Another trade partner noted that Xcel Energy's rebate offerings are comparable to Black Hills Energy; however, Xcel Energy's custom rebate levels are generally higher. Finally, another interviewee spoke about the challenges Southern California Edison is facing engaging large wastewater treatment plants. He/she explained the program is on a three-year funding cycle, which often is not enough time for these industrial customers to gain approval for projects and implement large retrofits. As a result, it has been difficult to get customers to commit to the program.

7.3.2 Interactions with Xcel Energy and Program Staff

Interviewees unanimously reported very positive interactions with Xcel Energy and the implementation contractor staff. During their involvement in the Process Efficiency program, trades most frequently communicated with the program's product manager and the participating customer's Xcel Energy account representative. Communications were typically in the form of email correspondence and/or by phone. Interviewees report that program staff were accessible, communicated effectively with both them and their customers, and were committed to making sure as many study recommendations were implemented as possible. Below are few specific comments from interviewees regarding their interactions with Xcel Energy:

"I know a lot of the people on the program team and they're all good to work with. I think Xcel Energy is a great organization to work with."

7. Evaluation Results – Trade Ally Findings

“Everybody I have worked with at Xcel Energy has just been super, very good to work with.”

“I can tell you that the Xcel Energy folks did an excellent job of explaining the program and their recommendations to the client in words they could understand.”

All but one participating study provider indicated that Xcel Energy and/or the program’s implementation contractor provided adequate information on what was expected of them and that they clearly understand what their role was going to be heading into the project. Scopes of work were generally agreed upon between the vendor and the program through a formal contract. One study provider did report that expectations were not clear at the beginning of their involvement with the program. According to this interviewee, it took a couple of days onsite before realizing that Xcel Energy primarily wanted him/her to provide study and consultation services, instead of selling or installing equipment through the program. He/she reported that there was no formal contract in place laying out the scope of work.

Interviewees had few recommendations for additional information or support from Xcel Energy, either relating specifically to the Process Efficiency program or other Xcel Energy offerings. Multiple trades noted Xcel Energy’s commitment to disseminating information about energy efficiency programs to vendors and contractors at events such as trade shows. One interviewee said it might be helpful if Xcel Energy met with them individually and explained how to better communicate program offerings to their clients. He/she explained that their company is very selective in what trade shows they attend and that the primary objective for most vendors is marketing and networking with clients, not learning about utility incentives.

7.3.3 Program Design and Procedures

Trades discussed several strengths of the Process Efficiency program in responding to the needs of the industrial sector. Specifically, interviewees report that the program has been successfully engaging key decision-makers from outset and getting industrial customers thinking about energy efficiency as a core component of their business. In addition, interviewees spoke highly of the program’s holistic approach, phased delivery, and Xcel Energy’s program management capabilities—specifically noting program and account management staff’s commitment to encouraging customers to follow-through with study recommendations. Below are some specific comments from interviewees on the program’s design and operations:

“The thing I like best is that the account managers act as project managers – they get customers motivated and are good at making contacts high up in the company and reaching the decision-makers.”

“Their ability to implement the projects [is what is working best about the program]; project management by account representatives, high implementation rate from study recommendations.”

“Xcel [Energy] did a nice job with a phased approach – they took care of the low-hanging fruit first so I could then focus on my strength which is looking at how they can tweak their controls systems.”

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“[The program] gives the end user, these extra-large customers, a way to prepare and come to grips with ways to save energy and make their facilities more energy efficient for sure.”

“I think [what is working best is] implementing the whole system and moving forward to demonstrate to the customer all the ins and outs of how the savings work and the payback.”

One of the researchable issues of the process evaluation is understanding third-party study providers' perception of the Process Efficiency program and its implementation contractor. One concern expressed by Xcel Energy staff is whether study providers view the program as a threat to their business opposed to a trade partner. Speaking primarily with vendors who have already participated in the program did limit the evaluation team's ability to explore this issue in depth. Still, two interviewees offered direct feedback on this issue. One of the interviewees, a participating study provider who has contracted directly with Xcel Energy and the program's implementation contractor, said he/she views the relationship with the program as a full partnership opposed to any kind of competition. The interviewee explained that his/her services were complementary to the services provided by the implementation contractor, commenting, *“there really was no level of competition there at all, we were just taking it to another level for the customer...it was just an additional benefit to the end user.”*

The second interviewee, who had less involvement with the Process Efficiency program, sees the program as both a trade partner and a potential competitor. The interviewee suggested that while they could have also performed some of the work the program's implementation contractor conducted for their customer, they also view the Process Efficiency program as a potential partner to provide their clients with more comprehensive benefits. He/she explained, *“The [program's implementation contractor] is an expert on energy, whereas we are experts on [the customer's industry]. We can provide that expertise as to whether or not this energy measure will work for [the customer].”*

Another key researchable issue for the process evaluation is whether the program's current eligibility requirements are most appropriate, or if Xcel Energy could benefit from broadening program eligibility. Currently, the Colorado Process Efficiency program is limited to industrial customers with at least two GWh of savings potential. Recently, the Minnesota Process Efficiency program lowered its savings potential eligibility from two GWh to one GWh. Two interviewees spoke directly about the program's eligibility requirements. One interviewee acknowledged the narrow industrial market in Colorado and the challenge it presents to recruiting participants and sustaining a pipeline of projects. He/she noted that this challenge is exacerbated by the long lead times associated with process efficiency projects. Another interviewee commented that they may be some large commercial customers, especially those with campuses housing multiple facilities, who might be good candidates for a program like Process Efficiency, but that generally commercial customers do have as many energy savings opportunities as industrial customers that have more energy-intensive processes. For this reason, he/she thinks that Xcel Energy is targeting the correct market for the program.

7.3.4 Customer Interactions

Trades reported regularly informing customers about Xcel Energy rebates available to them. Due to the narrow eligible market, interviewees generally do not promote the Process Efficiency specifically to customers. Instead, trades report evaluating all incentive options available to the customer as standard practice.

Trades typically reach the customer's facilities management or engineering staff, who then communicate up the decision-making chain internally. Multiple interviewees stressed the difficulty in getting projects approved from the "*bottom-up*"; that ideas for projects typically get shot down somewhere higher on the customer's decision-making chain than they are able to reach. As mentioned earlier, a couple of interviewees commended the program's ability to engage upper management from the outset to avoid chinks in the decision-making chain.

When asked what factors drive customer decision-making processes regarding implementing energy efficient equipment or practices, most interviewees pointed to return-on-investment or payback periods. Generally, customers look for a payback period of three years or less for most capital improvements. One study provided added that this priority on payback underscores the importance of feasibility studies like those provided through the Process Efficiency program to show customers evidence of return-on-investment. A couple of interviewees mentioned that in addition to payback concerns, maintenance and labor costs are higher priorities for large industrial customers compared to commercial customers because their maintenance costs comprise a significantly greater share of their operating costs.

7.3.5 Industrial Market

Trades were generally optimistic about the potential for energy efficiency in the industrial market. One interviewee referred to the industrial sector as the "*untapped market*" in energy conservation, specifically noting the large mining industry in Colorado. This sentiment was echoed by another trade partner who argued that many industries have largely exhausted the "*low-hanging fruit*", and in order to sustain the momentum for energy efficiency, utilities and industry partners will need to look beyond energy efficient equipment and put more emphasis on process efficiency. Another interviewee commented that companies are always making changes to optimize their industrial processes, providing continuing opportunities for energy efficiency.

7.4 CONCLUSION

Overall, trade partners are highly satisfied with their experiences with the Process Efficiency program and their relationship with Xcel Energy overall. Interviewees report very positive interactions with program and account management staff. Trades agree that the program is well designed to address the needs specific to industrial customers and that the industrial market, while narrow in the number of customers, holds substantial energy savings opportunities.

Interviewees had few critiques of the Process Efficiency program or recommendations for improvement. In one case, expectations for the secondary study provider's role in the project

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were not clearly understood heading into the work. Also, most interviewees were not very informed about other aspects of the Process Efficiency not directly related to their contracted scope of work. While trades all agreed that a deeper understanding of the program was not essential for the work they were being asked to provide, one interviewee did express interest in gaining a deeper understanding of the participation process.

8. EVALUATION RESULTS – BENCHMARKING

This section presents the results of a benchmarking study of process and industrial efficiency programs conducted as part of the evaluation of the Xcel Energy Process Efficiency program in Colorado. This effort also supported the evaluation of the same program in Minnesota, which was evaluated concurrently.

8.1 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 and staff. The internet research provided program background information for ten other utility programs recommended by Xcel Energy staff. Evaluators next conducted four in-depth interviews with program managers to obtain further insight into program design and implementation.⁹ The secondary research and in-depth interviews were completed in May and June 2012.

⁹ Program managers at other utilities declined opportunities to conduct interviews.

8.2 KEY FINDINGS

The secondary research reveals high diversity across national industrial programs on multiple dimensions. Overall Xcel Energy's program appears to be one of the most comprehensive and robust in its program services to industrial customers.

In particular, Xcel Energy's program is applying best practice by emphasizing both organizational and technical assessments, while many other programs focus on only one element. Moreover, measures bundling and bonus incentives offered through Xcel Energy's program incentivize customers to complete more comprehensive projects than they otherwise would.

The benchmarking study identified the following best practices:

- **Personalized customer recruitment.** Interviewed program managers noted that is the most effective way to recruit large industrial customers (particularly upper level management) and explain multi-phased program participation. Xcel Energy does this by involving customer account managers and sales engineers that are capable of discussing technical projects details with customer staff.
- **Organizational assessments and energy management/tracking training are program features.** The interviewed utilities recognize that upper level management commitment to energy efficiency is a key driver for short and long-term projects implementation, and that ongoing energy planning and tracking is needed to identify new opportunities. For cash constrained customers, strategic energy management (SEM) offers a way to achieve energy savings at relatively low cost. Xcel Energy puts high priority on organizational assessments, while other programs focus exclusively on short-term conservation projects.
- **Flexible approach addressing wide range of measures and processes.** Most of the reviewed programs can accommodate a wide range of projects, and in this regard Xcel Energy's program is similarly flexible and able to serve a diverse set of customer types with varying needs for efficiency upgrades.
- **Incentive level bonuses to promote more comprehensive and/or quicker project installations.** Xcel Energy does this through a formal incentive bonus mechanism for comprehensive projects by end-use, and other utilities have increased incentive payments for projects that are completed relatively quickly.
- **High level of engineering support and technical expertise.** Some programs do this using a contracted pool of proven engineering firms, while Xcel Energy does this using its own resources. Program managers noted that it is critically important to utilize engineering firms/staff that are experienced looking for comprehensive savings opportunities, particularly as "low lying fruit" projects are completed by program participants who must then search for "deeper" savings.
- **Opportunities for peer networking and public recognition of achievements.** These program offerings are well attended and highly valued by participants of one program in

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Colorado, and provide additional levels of efficiency information and customer benefits. Xcel Energy reports trying to capitalize on this Colorado statewide program. Minnesota has an opt-in Efficiency Partner recognition program and annual awards that Process Efficiency customers meeting minimum requirements are encouraged to apply for. While these awards and recognition are not specific to Process Efficiency, program participants have been recognized through them in the past.

- **Engineering study peer reviews.** This approach has increased the quality and completeness of technical studies produced by one program, and has increased both customer and vendor satisfaction. Currently Xcel Energy uses its own engineering staff to review and approve 3rd party vendor studies, and Xcel Energy could consider this approach if engineering vendor involvement increases in the future.

Lastly, two of the interviewed programs that claim energy savings utilize NTG ratios of approximately 85 percent.¹⁰

8.3 DETAILED FINDINGS

This section begins with 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 8-1 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:

- Energy Trust of Oregon (on behalf of PG&E and PacifiCorp) —Production Efficiency Program
- MidAmerican Energy Company —Nonresidential Energy Analysis Program
- Colorado Governor’s Office —Colorado Industrial Energy Challenge
- Rocky Mountain Power Utah —Energy FinAnswer

¹⁰ We did not have access to the detailed evaluation studies from which these results were derived.



Table 8-1. Process Efficiency Benchmarking

Organization	Xcel Energy	Pacific Gas & Electric (PG&E)	Energy Trust of Oregon, on behalf of PG&E and PacifiCorp	Mid-American Energy Company	Northwest Energy Efficiency Alliance (NEEA)	New York State Energy Research and Development Authority (NYSERDA)
State	Minnesota & Colorado	San Francisco, California	Oregon	Iowa	Oregon, Washington, Idaho, Montana	New York
Program Name	(Process Efficiency)	(Heavy Industry Energy Efficiency Program)	(Production Efficiency Program)	(Nonresidential Energy Analysis Program)	(Continuous Energy Improvement-CEI)	(Industrial and Process Efficiency Program)
Goal/Savings/Participation	MN 2012 Goals: 70.5 GWh, 165,000 Dthems CO 2012 Goal: 11 GWh	Projected kWh savings for 2010-2012 cycle: 59,428,571 kWh achieved to date: 40,660,106 kWh projected: 7,568 kWh achieved: 5,459 Gross therms projected: 5,942,856 Gross therms to date: 3,261,217 (to date is March 2012 EEEA filing)	2012 Goals = 160,450,000 kWh; 1,272,000 therms 2012 Budget = \$33 million	2012 targets: 114 electric projects (127 GWh, 23 MW); 28 gas projects (375, 209 therms) 2012 budget: \$3,467,000 electric; \$164,000 gas	As of 2010, 15% of Northwest's large food processing companies implemented CEI. NEEA and Northwest Food Processors Association (NWFFPA) members, in partnership with the U.S. DOE and Northwest utilities, used NEEA's CEI framework in 2008 to set an industry-wide energy reduction goal for NWFFPA members. This goal calls for an industry-wide energy intensity reduction of 25 percent in 10 years and 50 percent in 20 years.	Goals over three years: 840,000 MWh, 17 million therms (http://annualmeeting.nasee.org/presentations/Platt.pdf)
Customer Eligibility	MN: Large industrial customers with conservation potential of 1 GWh or 4,000 Dekatherms (Dth). CO: Large industrial customers with conservation potential of 2 GWh	Industrial code from NAICS code here (http://www.lmsi-pge.com/files/manual_slect1.pdf). Receive natural gas and/or electric from PG&E; Paying the public purpose program and/or demand side surcharge on utility bill; Minimum average peak electric load of 200kW	Industrial and agricultural customers, water agencies within Portland General Electric, Pacific Power, NW Natural or Cascade Natural Gas.	Must be retail customer of MidAm with commercial or industrial tariff, preapproval is required; facilities in Iowa service territory with 50k sqft or more, on site verification if over \$20k, can't do gas projects if gas isn't supplied by Mid-Am	Current initiative is focusing on food processors, small to medium manufacturing and agricultural irrigation. Online questionnaire determines eligibility based on a series of questions addressing company action already taken, resources available, and regarding operations.	Certain rate classes for specific utilities: Downstate utilities = Brooklyn Union Gas Co., Consolidated Edison Co., Key Span, Upstate = NGrid, Central Hudson, Natural Fuel Gas Distribution, NY State Electric and Gas Co., Orange and Rockland Utilities, Inc., Rochester Gas and Electric. First come first serve through 2015. Manufacturing facilities, or support operations such as warehousing and distribution sites. Examples industries are Plastics and Packaging, Chemicals, Petrochemicals, Metals, Paper and Pulp, Transportation, Biotechnology, Pharmaceutical, Food and Beverage, Mining and Mineral Processing, General Manufacturing and Equipment Manufacturers or Data Centers.
Qualifying Measure Types	A wide range of measures and process changes are eligible for rebates. Projects must have minimum of 2 GWh or 8,000 MCF of total conservation. Project paybacks must be greater than 1 year and less than 15 years. Measures bundling is permitted to allow measures with too short of a payback to be leveraged to drive projects with too long a payback, so that both can be implemented.	Criteria: Effective Useful Life (EUL) of at least 5 years; equipment must exceed minimum federal and state mandated EE performance or current industry standard, which is used to establish baseline; not receiving funds from other publicly funded EE programs.	Premium efficiency motors, compressed air, VFDs, lighting fixtures and controls, refrigeration, dust collection, pumps, fans, etc.	Boiler, chiller, windows, chilled water system, cooling tower pumps, piping, controls, and anything else that is energy related at a facility are all areas of focus for the assessment	Focus is on developing self-sustaining mgmt. systems based on process management principles and does not require capital improvements	Both electric and natural gas. (examples available at http://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/~media/Files/F/O/Current%20Funding%20Opportunities/PON%202456/2456summary.aspx)
Qualifying Process Improvements	A wide range of measures and process changes are eligible for rebates. Projects must have minimum of 2 GWh or 8,000 MCF of total conservation. Project paybacks must be greater than 1 year and less than 15 years. Measures bundling is permitted to allow measures with too short of a payback to be leveraged to drive projects with too long a payback, so that both can be implemented.	List includes but not limited to: process cooling, process controls, piping system changes	see above	see above	see above	Scrap Reduction, Throughput Increases, LEAN/Six Sigma Projects, Air Flow mgmt., Cooling, Use of Waste Heat, UPS System Upgrades
Organizational Assessments	Emvinta One2Five software is used to benchmark customer on various organizational aspects, including: energy and other resources consumption, corporate commitment, strategic planning, staffing capacity and funding.	Audits are focused on technical equipment and not organizational issues.	Audits are focused on technical equipment and not organizational issues. A separate program track provides SEM training.	Customer has option to conduct a management assessment during initial kickoff meetings to understand existing business processes that influence energy management.	Emvinta One2Five energy management assessments and ENERGY STAR Energy Program Assessment Matrix. Followed by team organization and management plan creation (guided with NEEA documents). Conduct annual energy management system assessments.	Audits are focused on technical equipment and not org issues.
Customer Participation Process	In Phase 1, customer applies to program, signs MOU1 on participation expectations and completes Emvinta and technical assessment. In Phase 2, customers and Xcel sign MOU2 to develop action plans, project scopes and rebate estimates. In Phase 3 MOU3 signed confirming implementation projects and schedule, projects installed and metered, final rebates paid.	Introductory presentation visit, fill out Access Agreement, LMSI conducts audits in one to two visits. Calculations done by industry expert, fill out Commitment Agreement (contains estimates, verified have not received other incentives), fill out Completion Agreement which triggers incentive payment	ETO funds Program Delivery Contractor (PDC) scoping study and technical contractors can be involved if necessary. PDCs will develop specifications, evaluate contractor bids, facilitate paperwork for incentives and help with tax credit.	MidAm completes a scoping-level or an investment-grade audit (for investigating more complex projects). Facility-wide assessments are skipped if customer knows what needs attention and just wants technical and financial assistance. Customer responsible for: organizing measures into action plan, requesting pre-approval, requesting project preapproval of projects recommended in facility assessment, implementation notification of completion, receive rebate check. MidAm responsible for: screening applicants, completing enrollment, kickoff meeting, comprehensive energy assessment, developing assessment reports, consulting with customer.	Involved process that includes five stages with planning documents, goals, meetings etc.: 1. Engage, 2. Plan, 3. Commit, 4. Practice, 5. Sustain	Feasibility study is done through FlexTech program where cost is shared 50/50 through use of choice consultant or NYSEDA's pre-qualified consultant. Industrial Process Efficiency team will identify projects, visit site, meet with team and help with application process. Focus Team helps with data centers. Apply through CFA (Consolidated Funding Application)
Rebate Amounts	Program uses same prescriptive and custom rebates as standard product offerings. CO standard custom incentives are \$400/KW and \$4/Kth. MN custom incentives \$400/KW and \$5/Kth. Final rebates recalculated if metered savings are more than 10% different than estimated. Bonus incentive of 30% if customers complete all projects associated with an end use. Annual Achievement Bonus also available if actual savings exceed formal plans by 115% or 130%. Customer cost for Phase 2 engineering and scoping assistance is 25% of total, capped at \$7,500.	All capped at 50% of total project cost: Lighting: \$.05/kwh; Process, motor & other equipment: \$.09/kWh; AC & fridge: \$.15/kWh; AC & fridge II: \$.09/kWh; Peak Electrical Demand Savings: \$100/KW; Natural gas measures: \$1/therm	Non-lighting: \$.25/kWh up to 50% of eligible project costs; lighting incentives not to exceed \$.17/kWh or 50% of project costs; Custom lighting incentives are 35% of cost; NEMA motors: \$10/hp, up to 200hp. Municipal/service district project: \$.32/kWh up to 50% of project costs. Payback must be 12 months or more for full custom incentive. O&M incentive are \$.08/kWh and \$.40/therm. Paybacks <12 mo. and Strategic Energy Management projects are \$.02/kWh and \$.20/therm up to 50% of cost.	50 to 100% of the cost of detailed studies, dependent on the customer implementing the study recommendations. Capped at the value of one year of energy savings. Equipment is reimbursed to buy down owner occupied projects to 1 year payback, and 0.5 years for rental spaces. Incentives are capped at 4 years of energy savings.	N/A	(Utility/Upstate/Downstate) Process and Energy Efficiency: (Electric /\$.02.12/kWh /\$.06/kWh), (Natural Gas / \$15/MMBtu /\$20/MMBtu) O&M: (Electric /\$.05/kWh /\$.05/kWh), (Natural Gas /\$.68/MMBtu /\$.68/MMBtu) Maximum incentive all projects 50% project cost, Electric \$5 million/Facility/Year, Natural Gas \$1 million/Facility/Year
Vendors Roles	Initial organizational and technical assessments are completed by contractors selected through RFP process. Customers may then choose their own vendors to scope and implement projects. Xcel Energy provides lists of participating contractors in other programs, but does not recommend vendors.	Vendors can help to calculate energy savings, then due-diligence review is done by LMSI if savings are calculated by vendor, previous audit, or industry expert. Implementation is performed by LMSI engineers who source contractors/suppliers.	Large customers/custom projects assigned to 3P contractors (Program Delivery Contractors - PDCs) who do assessments, scoping, bid judging. Also have 2 other contractor pools - technical studies or SEM. Are 6 PDCs (with 50 total staff) with territories and goals, new RFP for PDCs each 3-5 years. 5 contractors (Industrial Service Providers) used for SEM. ATAC is an independent engineering firm contracted by ETO and does technical studies if needed. ETO assign PDCs and other 3Ps by sector and geography. Smaller sites (utility costs < \$100k/year) work more with trade allies on prescriptive measures/calculated savings (air compressors, irrigation).	Any vendor in MidAm's territory that specifies, sells or installs equipment may participate, although customer participation is generally driven by program manager. Trade allies that bring projects to the program must coordinate with the program manager on project studies. Customers can select vendors to perform detailed studies and install qualifying projects. MidAm retains the right to pre-qualify contractors not already on its list. MidAmerican will: analyze cost, identify potential rebates, verify projects, and process rebate checks.	None described	NYSEDA engaged three contractors: CHA, ERS, Willdan Energy Solutions to be "Focus" contractors who explain incentives and application process, identify cost-effective energy savings options, and support project development and implementation.
Website marketing	Program information hard to find on website, not widely marketed. http://www.xcelenergy.com/Save_Money_&_Energy/For_Your_Business/Customized_Solutions/Process_Efficiency_-_MN	http://www.lmsi-pge.com/lmsi-main.html	energytrust.org/pe	http://www.midamericanenergy.com/ee/ia_bus_eff_partners.aspx	energyimprovement.org http://www.energyimprovement.org/getstarted.php	http://www.nyserda.ny.gov/Page-Sections/Commercial-and-Industrial/Programs/Industrial-and-Process-Efficiency.aspx
Other info	Program is not widely marketed, and is primarily promoted by Account Managers with technical support from Sales Engineers. Sales Engineers facilitate projects scoping with customers and their vendors, and support Account Managers and Technical Engineers (who calculate energy savings).	Program is implemented by Lockheed Martin Services, Inc.	65% of projects are Custom; remainder are trade ally driven. Program has been offered since 2003. 983 projects in 2011 - leaders are industrial lighting, sprinklers, replacement gaskets, nozzles, compressed air improvements, process upgrades. 2011 savings = 13.8 MW and 1.03 million therms. Program costs approximately \$0.03/kWh over measure life (not readily available for therms)	Program is implemented by Nexant	Goal is to help companies save 5% in energy costs without capital improvements. When combined with a capital improvement plan, companies can realize up to 20% in total savings.	



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Organization	Colorado Governor's Office, implemented by Southwest Energy Efficiency Partnership (SWEEP)	Southern California Gas (SCG)	Duke Energy	Oncor	Rocky Mountain Power
State	Colorado	San Diego, California	Charlotte, North Carolina	Texas	Utah
Program Name	(Colorado Industrial Energy Challenge)	(Incentives for Equipment Replacements and Process Improvements Program)	(NC Process Equipment Incentives Program)	(Targeted Industrial Energy Efficiency Program)	(Energy FinAnswer)
Goals/Savings/Participation	Sets five-year EE goals for each participant. Participants sign up for (at least) 2% per year intensity goal or set total energy consumption goals. 27 participant companies have/will set goals, 15 have received assessments. Program started in March 2010, few projects have been completed. Max company self-reported energy savings from 2009-2010 was 18%. Two companies have hired or contracted with new EE managers.		10-20% of EE goals related to control, process optimization, and behavioral change (http://www.cees.ingersollrand.com/CEES_Documents/Duke_Energy_DeanMolino.pdf)	Identify and implant electric demand and energy reduction opportunities to improve efficiency of major electrical systems and reduce energy cost without adversely affecting facility or system operations	UT 2012 goal = 69,300,000 kWh
Customer Eligibility	Industrial facilities with more than \$400,000 in annual energy costs.	Minimum projected savings of 200,000 annual therms. If savings >200k therms/year, energy analysis must be approved by a Registered Professional Engineer	Pay non-residential rate for Duke Energy NC. Applications must be submitted within 90 days of installation and operation. Leased Equipment is eligible. Must provided tax information.	For-profit industrial customers of Oncor at a point of delivery transmission level of 69kV or higher. Reduced cost audit must have commercial less than or equal to 250kW for maximum monthly peak demand during preceding 12 months	Industrial and commercial customers with at least 20,000 sq ft. This specific program targets large custom projects, whereas other programs serve other project types (see Other Info)
Qualifying Measure Types	Focus on projects with payback period longer than two years.	None listed	Refrigerators, Equipment Insulation, Water Heaters, Lighting, Lighting Controls/Sensors, Chillers, Heat pumps, Central Air conditioners, Compressed air, Programmable Thermostats, Energy Mgmt. Systems/Building Controls, Windows, Motors, Motor VFDs, Processing and Manufacturing Equipment, Custom/Others pending approval, Led Exit Signs, Room Air Conditioners, Vending Machine Controls, Commercial Cooking Equipment, Commercial Refrigeration Equipment, Food Service Equipment, LED Traffic Signals, Thermal Storage Units	Must be measurable, must exceed minimum equipment standards. Chiller or packaged cooling unit replacement, water heating HP, air to variable air-side conversions, fan and pump motor efficiency, VSD with other measures, forms of heat recovery, high efficiency fluorescent lighting, LED and induction lighting, exterior lighting, controls, CFLs with hard wired ballasts air cooling and refrigeration compressor replacement, refrigerated case doors, motor-efficiency upgrades, cool roof, renewables, fuel switching, compressed air optimization, air compressor replacement, heat recovery controls, cooling towers. excluded: plug loads, self-generation (except for renewables), behavioral, result in negative environmental or health effects, involve fuel switching.	Capital measures with payback > 1 year
Qualifying Process Improvements	Focus on projects with payback period longer than two years.	None listed	Barrel wraps, pellet dryer duct insulation, engineered nozzles-compressed air.	chillers, lighting, compressed air, etc.	Projects with payback > 1 year
Organizational Assessments	Assessments not provided. SEM practices presented at participant networking events.		NA, but planning form is available to assure that measures can be rebated		None offered in UT yet. Pilot program budget has been allotted for Customer EE Program Manager training in WY, but there has been no participation yet. The program may add an organizational assessment/training component when program design changes made in October 2012.
Customer Participation Process	Assistance with goal setting, one day walk through assessment. In 2012, partner companies will pay for 25% of cost for assessments. Program provides referrals to consultants and vendors as well as assistance for loan application and incentive information. Sign a commitment letter agreeing to set a five year goal for reducing total energy use or energy intensity and report total consumption or intensity for the base year and the following five years.	Complete application with savings worksheet, detailed scope of work stamped by professional engineer, draft M&V plan, and draft project timeline w/ key milestone. Application approval followed by 90 day hold for AR to guide through project advancement process, pre-installation site inspection. Both parties agree on M&V plan, measurement documentation and verification, and then project milestones are met.	Customer completes application for Smart Saver Program, Customer or Trade Ally provides energy Savings calculations, DE evaluates application and communicates incentive pre-approval, customer installs, requests payment, receives payment and then is verified.	Sign application for participation, conceptualization meeting, initial audit, detailed audit report, implementation either in-house or through contractors, project progress meeting, verification report, overall program review/coordination. Customer must have staff to attend meetings, allow facility staff time to be dedicated to work, etc.	1. Scoping: Customer signs letter of intent, program identifies "menu" of potential projects with prelim costs/savings/incentives/paybacks, customer develops preliminary plans and schedule. 2. Energy Analysis: customer gets free, investment grade report on projects with highest likelihood of implementation, with refined cost and savings estimates. Also include incentives estimates and commissioning requirements. 3. Incentive Agreement: Customer signs before purchasing equipment and securing financing. 4. Implementation: Customer completes projects and submits commissioning and costs reports with labor and materials itemized. 5. Inspections and Payment: RMP calculates incentives based on inspections and costs verification.
Rebate Amounts	No capital incentives provided. Loans up to \$3 million over 10 years available at 5% rate for payback periods greater than 2 years.	The lesser of \$1/therm or 50% of cost (excluding taxes and internal labor). Max incentives total \$1 million per project and \$2 million per premise per year.	Fluorescent Lighting and Reduced Wattage: \$3-\$50/fixture, High Bay Fluorescent Lighting: \$30-\$120/fixture, Metal Halide Fixture (< 320 watts): \$25/fixture, Light Tube: \$75, LED Exit Signs: \$12/eign, LED Case Lighting: \$50/door (\$10/sensor), LED Traffic Signals: \$12.50-\$25, Occupancy Sensors: \$20-\$40/sensor, Air Conditioners: \$20-\$40/ton, Heat Pumps: \$20-\$40/ton, Room/Sleeve A/C Units: \$25-\$50/unit, Heat Pump Water Heaters: \$2,000-\$9,000/unit, Programmable Thermostats: \$50/unit, Window Film: \$1/sq. ft., Chillers: \$5-\$30/ton + additional incentives depending on full load kW/ton and EER/ton Thermal Storage Units: \$190/kW shifted, Motors: \$4-\$10/HP, Pumps: \$122-\$400/pump, VFDs: \$40/HP (for process pumping), \$100/HP (applied to HVAC equipment), Barrel Wraps: \$1/ton, Pellet Dryer Duct Insulation: \$13-\$40/foot, Engineered Compressed Air Nozzles: \$20/unit, Vending Equipment Controllers: \$50, Head Pressure Controls: \$60/door, Display Night Cover: \$5/in. ft., Commercial Refrigerator: \$50-\$150, Ice Maker: \$150-\$500, Cooking Equipment: \$150-\$1000, Vending Controls: \$50/unit, Anti-Sweat Heater Controls: \$40/door	(Measure, \$/kW, \$/kWh) (Air Compressor \$186.16 \$0.0573) (Biomass \$185.25 \$0.06180) (Chillers \$288.60 \$0.0888) (Controls \$186.16 \$0.0573) (Data Center UPS \$179.00 \$0.0501) (Data Center Virtualization \$102.75 \$0.0288) (DX Air Conditioners \$244.92 \$0.0754) (Geothermal \$321.10 \$0.0988) (Lighting: Light Emitting Diode (LED) \$169.56 \$0.0471) (Lighting: Modular CFL and CCFL Fixtures \$176.40 \$0.0490) (Lighting: High Intensity Discharge (HID) \$169.56 \$0.0471) (Lighting: Linear Fluorescent \$169.56 \$0.0471) (Lighting: Rep 112 Non Electronic \$108.90 \$0.0303) (Motors: \$244.92 \$0.0754) (Solar PV \$530.80 \$0.3981) (Solar Water Heater \$244.92 \$0.0754) (Thermal Storage \$288.60 \$0.0888) (Wind Generation \$179.00 \$0.0501) (Window Film \$179.00 \$0.0501). Incentive cap in 2011 was 1,105 million dollars per customers. Multiple calculations for incentive for a project (\$) ≤ 80% x Cost of implementation of the project (\$) or Incentive paid (\$) ≤ Estimated Incentive in the Project Summary Table (PST) (\$) or Incentive Payment (\$) (single installment) = Incentive (\$) based on verified savings or Installation on Payment (\$) = 40% x Estimated Incentive (\$) or Performance Payment (\$) = Incentive (\$) based on verified savings – Installation Payment (\$)	UT incentive = \$.12/kWh + \$50/kWh, up to 50% of project costs.
Vendors Roles	Southwest Energy Efficiency Project (SWEEP) leads and coordinates the program. Colorado State University's Industrial Assessment Center provides many assessments, focused mainly on electric measures. Environmental engineering firm ETC Group also provides assessments (primarily gas processes).	None listed	Vendors can sign up to be participating vendors via Duke Website. Vendors may use the name to advertise, may receive incentive funds, and are responsible for sale only and not necessarily installation.		Technical work is outsourced to pool of 26 engineering firms (serving 5 program states) in western US with 3-year contracts. 6 RMP Project Managers match engineers with customer needs (consider geography, past work). The contracted firms don't do marketing and have no performance goals. Technical studies are peer reviewed by the other firms. Program marketing is done jointly by the 6 PMs and customer Account Managers.
Website marketing	http://www.swenergy.org/programs/industrial/ciec/recognition.htm	http://www.socalgas.com/for-your-business/energy-savings-large-business-customers.shtml	http://www.duke-energy.com/pdfs/NC_Process.pdf	http://www.takealodofftexas.com/index.aspx?id=targeted-industrial	http://www.rockymountainpower.net/bus/se/epi/utah/lic.html
Other info	Program helps to serve companies too small for Xcel Energy's program and customers with large gas processes. (Xcel CO only serving electric customers; many customers buy gas on open wholesale markets). Budget is \$550,000/year from DOE and State Energy Office.			Program is implemented by Nexant	Information above is for Retrofits element of program; new construction projects have additional requirements and steps (e.g., measures must exceed code by 10%, construction documents reviews). Program Benefit/Cost ratio for Utah has historically been over 3 (including large commercial customers). Most saving are between 200,000 and 300,000 kWh from large industrial; is also a lot of activity in mid-market industrial (200 to 500 kW). Wide range of participant sectors - food, schools, retail, industrial, recreation, office, irrigation, lodging. Other RMP programs for industrial customers are: FinAnswer Express (prescriptive rebates for lighting, some HVAC), Recommissioning and Self-Direction credits.

8.3.1 Program Scope and Goals

Xcel Energy's 2012 savings goal for the Minnesota and Colorado Process Efficiency programs are approximately 71 and 11 GWH, respectively (Minnesota also has a goal of 165,000 Dtherms, Colorado does not have a gas savings goal). Information about other programs' savings goals is listed in the previous tables. Most of the programs set annual goals, which can present a challenge in trying to complete large capital projects in time to claim savings for a particular year. All of the interviewed utilities with savings goals described pressures trying to finish multi-year projects by calendar end dates, and customers can be similarly inconvenienced when cash outlays are accelerated and do not match their own budget cycles.

Despite this challenge, the interviewed utilities have generally been able to meet their past savings goals, even in the current recession. Factors that were noted to facilitate programs participation include:

- Customers with “organizational readiness” for energy efficiency and/or an established culture of “lean production”
- Flexible program designs that allow customers to explore general interest areas, specific projects, and a wide range of measures (i.e., a program driven by their needs)
- Peer networking opportunities, where customers can share project ideas and implementation experiences
- Public recognition of achievements, since many companies want positive public relations to complement their energy savings (this can incite competitor firms to participate also)¹¹

The primary participation barriers noted by the interviewees include:

- Inadequate company staff resources/time to manage projects from identification to implementation
- Capital budget constraints
- Long project paybacks; industrial customers are perceived to want paybacks of two years, and will accept paybacks of two to five years if non-energy benefits are also obtained. Payback of eight years or more are no longer feasible.
- Reluctance to set goals to which staff will be held accountable
- Perceptions that all energy savings have been obtained

¹¹ The CEIC program conducts half-day networking sessions that include: 1-2 short company presentations on specific projects, presentations by program staff or consultants on SEM topics with Q&A, and host company site tours. The program also gives annual awards based on achieved energy savings and elements of SEM put in place (e.g., new energy efficiency teams).

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One utility noted that customer cash constraints can be a temporary situation and an opportune time to conduct additional studies, to keep them engaged and help them be ready to proceed when the funding returns. In particular, lower cost operations and maintenance (O&M) and strategic energy management (SEM) solutions can become a fruitful focus area, and require customer labor but little capital funding. (Additional information about SEM is presented subsequently.)

Regarding program potential, various interviewees perceived that there is strong savings potential in the commercial office, schools, food processing, and pulp and paper sectors, and the industrial mid-market sector (200 – 500kW). In addition, one interviewee believed there are still plentiful opportunities for lighting retrofits in the industrial sector. Importantly, repeat customers can also be a rich source of future projects (one program gets 95 percent repeat participation by the same customers for new sites). Strong customer relations are of key importance, with lots of strategic planning and “check-ins”, because operations are constantly changing in plants (e.g., changing shifts, new batch processes).

8.3.2 Program Design, Measures and Incentives

The secondary research reveals high diversity across the “peer” programs on multiple dimensions, and overall Xcel Energy’s program appears to be one of the most comprehensive and robust in its program services. Regarding eligible customers and sectors, Xcel Energy targets its largest industrial energy users, and other programs also do this (e.g., PG&E, Southern California Gas Company, NYSERDA). Agricultural customers are usually allowed to participate in the programs too. Other programs expand eligibility to include large commercial customers (e.g., MidAmerican Energy Company, Rocky Mountain Power), while NEEA’s program focuses on specific industries that have been underserved in the past and/or where high potential energy savings have been estimated (e.g., food processing, agricultural irrigation). Most of the programs require that eligible industrial (or commercial) customers meet specific annual energy consumption or cost thresholds, exceed project savings thresholds or occupy a minimum amount of square footage.

Xcel Energy is considering expanding program eligibility to commercial customers, and is currently conducting a pilot initiative in Minnesota to test this approach. Rocky Mountain Power currently allows commercial customers with 20,000 or more square feet to participate in its Energy FinAnswer program, and may remove or lower this square footage criteria going forward. According to the program manager, the technical resources (e.g., engineering services) the program must provide to commercial customers are generally similar to those provided to industrial customers, and there are economies of scale in staffing. In addition, the program can regulate the services provided to commercial customers, and only provides “appropriate engineering efforts.” Notably, program satisfaction is very high among both industrial and commercial participants, and the program regularly attains benefit/cost ratios greater than 2.5.

Importantly, the Rocky Mountain Power program currently contracts with 26 western US engineering firms to provide technical studies, so the program has robust resources to serve industrial and commercial customers. Engineering contracts are renewed each three years through an RFP process, where potential contractors must provide: sample work scopes and analyses, report/writing samples, sectors work experience (including specific

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building types), and customer references, all of which are to support a self-rating expertise matrix each firm must complete. Rocky Mountain Power managers know which skill sets they need to comprehensively serve their customer base, and make the selections accordingly.

MidAmerican's Nonresidential Energy Analysis program is also open to commercial customers. The MidAmerican commercial program manager reported that while the types of opportunities differ between the commercial and industrial sectors, the program delivery is basically the same to commercial and industrial customers (the program does; however, have separate program managers for the two sectors). The program manager said they have been able to make commercial projects cost effective, and they are actually expecting more commercial participation in the future due to the existing equipment stock and lack of energy management staff resources.

Regarding eligible projects, most programs have broad definitions that allow lighting, motors and VFDs, HVAC, compressed air, refrigeration, controls, boilers, chillers, pumping and other measures. In addition, the programs do not restrict process improvements, and typical projects include process cooling, air flow management, and waste heat recycling. Generally, eligible projects must have payback periods longer than one or two years. Xcel Energy's program is very flexible and comparable regarding eligible project types. Importantly, Xcel Energy's program also permits measures bundling; other programs do not appear to allow this. Measures bundling allows measures with too short of a payback to be "combined with" projects with too long a payback (more than 15 years), so that both types can potentially be implemented. One of the interviewed utilities specifically noted that requiring cost-effectiveness for all individual measures was inhibiting some savings opportunities. However, it is worth raising the concern that measure bundling could decrease the program's attribution as the program may be less influential in the projects that have short paybacks without a rebate.

In contrast to the other programs, NEEA's program includes a separate "track" specifically promoting strategic energy management (SEM) practices, and the Colorado CEIC program is only focused on providing initial energy assessments and goal setting assistance – it does not focus on technical projects scoping or provide incentives for capital projects.

The utilities also have different practices regarding their incentives levels, which offer different benefits and constraints. Xcel Energy's Process Efficiency program offers the same base-level prescriptive and custom rebates as its standard product offerings. A utility that has distinct incentives for large (primarily custom) industrial projects, and other incentives through its prescriptive and self-direct programs, noted that its customers can initially be confused about the different program offerings and incentive levels, although this can be overcome with high personal attention from program managers and account managers. In contrast, The Energy Trust of Oregon has a standalone Industrial program and incentives structure.

Capital project incentives are often capped at 50 percent of total project capital costs (some include engineering studies), or the value of energy savings for a specified period (one to four years). One utility (MidAmerican) adjusts capital incentives to buy down owner-occupied projects to a payback of one year. Some utilities also have absolute annual

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incentive caps, or caps per facility. Lastly, engineering study assistance may be provided for free or at reduced customer cost (e.g., 25 or 50 percent of total cost) capped at some absolute spending level or equivalent to year-one energy savings.

Like Xcel Energy, a couple of programs offer some type of “bonus” incentives to encourage more comprehensive end-use projects and continual customer participation. The Energy Trust of Oregon has sometimes implemented “90 by 90” campaigns to accelerate projects during the economic recession. These “bonuses” allow customers to receive incentives up to 90 percent of total project costs if they complete their projects within 90 days of the recommendations. MidAmerican recently instituted a graduated incentive structure to promote more comprehensive and continuing participation, where rebate levels increase as the customer implements additional projects. According to the MidAmerican commercial program manager, while this change has encouraged continuing participation, it also has caused some confusion among customers and has presented some tracking challenges.

Customer organizational assessments are a key feature of Xcel Energy’s program, and according to one of the assessments contractors, companies with high-level management participation and program “buy-in” have greater likelihood of completing more projects over multiple years. Xcel Energy uses the EnVINTA One2Five software in Phase 1 of a customer’s program participation to benchmark the customer on various organizational aspects, including: energy (and other resources) consumption, corporate commitment, strategic planning, energy staffing capacity and funding. Some programs do not offer these organizational assessments (e.g., PG&E, NYSEDA) while others focus exclusively on this (NEEA, also using EnVINTA One2Five). For Mid-American customers, organizational assessments are optional. According to MidAmerican’s commercial program manager, MidAmerican originally promoted EnVINTA for all participants, but few customers wanted to participate.

Notably, the Energy Trust has realized increasing program savings (currently about 15 percent) from SEM “measures”, which have their own incentives level. SEM participants receive extensive training and technical support to learn how to create continuous energy improvement. They achieve behavioral energy savings through implementing O&M actions/measures, which Energy Trust defines as “measures that are often highly subject to operator/ employee failure.” Examples include compressed air leak reduction, changing set-points on equipment or implementing standard operating procedures (SOPs) that require equipment shutdown. For SEM participants, persistence is attained from the SEM training itself – by teaching customers to use energy data to tune their operations, they are enabled to know when behavior is slipping and they are losing the savings they have already achieved.¹²

¹² Energy Trust provided two examples of SEM projects: a water utility was double-pumping water, taking it two stages up a hillside instead of just bringing it up to the first reservoir. Understanding the (large) energy impact of pumping made them question whether sending the water up higher was necessary, and when they decided it was not and stopped, they reduced their energy intensity by > 15 percent. Another example is in a pressboard manufacturing plant, where they had a 3rd shift of six people on graveyard doing one single step of their process, but using almost 80 percent of the energy needed during the full 1st and 2nd shifts. They moved that production stage and those six employees into 2nd shift, shut down the plant entirely for the 3rd shift and reduced their plant’s energy intensity by > 20 percent. Being trained to understand their energy data was the basis for these changes. Importantly, the NWPPC 6th Plan includes SEM savings potential, and BPA and its retail utilities are directed to get this resource (i.e., there is enabling policy). O&M measures, separate from SEM, are also offered through the main Custom program track. O&M measures require customers to implement an approved persistence strategy. O&M examples include changing SOPs, installing flow-meters and developing SOPs for how often and how those will be checked to ensure that the O&M measures are persisting.

Lastly, the programs have a range of models for utilizing technical vendors and study providers. Xcel Energy has contracted with two firms to conduct initial organizational audits and technical assessments, and then customers are free to use their own vendors for detailed engineering studies. The CEIC program, delivered by SWEEP, has contracted with two organizations to provide energy assessments, the primary service offered through the program. PG&E has contracted a third-party (3P) engineering for overall program delivery, and while other engineering firms can conduct technical studies, projects implementation is led by the 3P contractor. Three programs (Energy Trust, Rocky Mountain Power, NYSERDA) use pools of pre-approved technical engineering firms to manage larger/custom projects (assessments, scoping, implementation), and two of these organizations use the contractors for customer recruitment too. More specifically:

- Energy Trust's largest customers/custom projects are assigned to one of six Program Delivery Contractors (PDCs) that do assessments, scoping, bid judging, and project verifications.¹³ There are also two other contractor pools - for technical studies or SEM projects. Energy Trust program staff assign PDCs and other contractors by customer sector and geography. Large process projects have a standard scoping report to identify opportunities and guidelines for technical studies elements. Smaller sites (utility costs < \$100k/year) work more with trade allies on prescriptive measures/calculated savings (air compressors, irrigation). Two "Trade Ally Coordinator" PDCs focus on Lighting or Small Industrial/Agriculture projects, and provide trade ally training and support, review all the forms coming from trade allies and inspect many of the projects done through trade allies. These two PDCs train the trades to use Energy Trust's savings standard calculation tools correctly.
- Rocky Mountain Power has its approved contractors peer review others' technical studies, and this has been enthusiastically received by the customers, contractors and program manager, all of whom are constantly improving their technical knowledge. According to the program manager, its contractors are very competent and active in the market place, and the program uses leading engineering firms across the entire western US.

Both of the above programs reported that they have few problems with customer applications and study completeness due to the experience and competence of the engineering contractors used.

8.3.3 Program Impacts

Table 8-2 summarizes program impacts information that was obtained from the program manager interviews. As shown in the table, one of the programs does not claim energy savings and another program is conducting net-to-gross analysis for the first time this year. The other two programs reduce claimed energy savings by about 15 percent, on average,

¹³ The PDCs get minimal savings-based compensation, less than 3 percent of their total contract, which keeps this aspect from biasing their relationships with Energy Trust's customers.

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for free ridership based on evaluation studies. These rates do not include spillover. While previous evaluations for one program estimated spillover to be relatively minor, the program manager at the other utility believed that spillover is likely to largely offset reductions from free ridership.

Table 8-2. Program Impacts Summary Information

Organization	Program	Impacts Information
Energy Trust of Oregon	Production Efficiency	2011 free ridership is 14% for electric measures and 20% for gas measures. The program also applies technical realization rates (usually close to 100%) and includes spillover (estimated to be minimal in past evaluations).
MidAmerican Energy Company	Nonresidential Energy Analysis	Conducting NTG analysis this year for the first time.
Colorado Governor's Office	Colorado Industrial Energy Challenge	Not tracked. This program does not provide incentives for capital projects, and focuses on providing subsidized assessments to drive future projects. Company energy savings are reported by the participants themselves, and some do not normalize for production levels. There is no attempt to attribute installed projects to the CIEC program or other factors.
Rocky Mountain Power, Utah	Energy FinAnswer	2011 Annual Report shows NTG of 87% for all measure groups; this does not include spillover.

8.3.4 Program Recruitment and Participation

The various utility programs are primarily serving the largest industrial customers, and outreach/education is typically through account managers. Programs that serve smaller industrial customers (e.g., Energy Trust) or commercial customers (Rocky Mountain Power) also utilize (multiple) program managers or Program Delivery Contractors to “hand hold” projects. MidAmerican’s commercial program manager emphasized the important role account management plays in customer outreach and keeping participants engaged in the program. Notably, one of the successes the program manager noted was the recent creation of a “task force”, which includes key account management staff and meets regularly to discuss how the program is working and how to best address customer feedback. He/she also mentioned that non-managed participants tend to be more self-motivated.

While program participation decisions often depend on factors mentioned previously (company culture, available budget), one interviewee noted that customer trust and participation can be increased by emphasizing the fact that the utility has a need (and self-interest) to reduce its resource costs, and energy efficiency programs are a valid and proven way to accomplish this. In particular, some customers are initially skeptical of incentives to conserve energy, but then continue to do more projects each year after their initial (positive) experience and growing experience with the program.

Another utility encourages repeat participation more directly, by offering increasing incentives over time. Initial projects are incented at the normal prescriptive rebate level, however second projects are incented at a higher level, third projects at even higher level, etc. This approach, however, has been met with some resistance from large customers, who find it more difficult to incorporate into their budget cycles.

8.4 CONCLUSION

In summary, Xcel Energy's Process Efficiency Program is broadly consistent with most of the programs that were reviewed, although it differs in some key respects. In particular, Xcel Energy's program is applying best practice by emphasizing both organizational and technical assessments, while many other programs focus on only one element. Moreover, measures bundling and bonus incentives offered through Xcel Energy's program incentivize customers to complete more comprehensive projects than they otherwise would. The best practices identified at the beginning of the benchmarking study offer additional strategies to consider to further increase program participation.



9. EVALUATION RESULTS – NET-TO-GROSS PROGRAM IMPACTS

This section details the results of the net-to-gross analysis conducted as part of the evaluation of the Xcel Energy Process Efficiency program in Colorado.

9.1 INTRODUCTION

Net-to-gross (NTG) is one indicator of program performance. Net-to-gross estimates the program's influence in the implementation of program-eligible equipment. The NTG ratio is the ratio of program-attributable savings over program gross savings. 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 the absence of that program) and **program-induced spillover** (i.e., additional energy-efficiency projects implemented by customers due to program influences but without any financial or technical assistance from the program).

The evaluation team calculated the NTG ratio using an enhanced self-report approach (SRA) based on the California framework detailed below and substantiated through case study reviews. The calculated SRA NTG ratio is based on quantitative surveys with active Process Efficiency participants regarding recently-completed projects (since January 2011). Individual SRA NTG ratios were triangulated with case study reviews for each surveyed participant due to the small population of participants, uniqueness of customers, and skewed distribution of energy savings commonly associated with large industrial programs. The case study review included a thorough review of all customer open-ended responses, discussion of projects with program staff for additional context and an account manager interview for the one case where it was determined additional information was needed on the decision-making process.

When interpreting the NTG ratio as an indicator of program performance, it is important to keep the following in mind:

- The calculated SRA NTG ratio 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 calculated SRA NTG ratio does take into account participant spillover, we took a conservative approach that is limited to 'like' spillover as discussed below. In addition, the calculated SRA NTG ratio does not take into account all market effects resulting from the program (e.g., vendor changes in energy assessments and sales practices, etc.), although these effects are qualitatively assessed through in-depth trade ally interviews.
- The NTG ratio analysis presented here is based on past program participation and any changes to program design, delivery, or target market should be taken into account when deciding what NTG ratio to apply to the program in the future.

Key findings from the NTG research are highlighted below, followed by the detailed methodology and results.



9.2 KEY FINDINGS

Table 9-1 below presents the current deemed NTG ratio used for the Colorado Process Efficiency program and the customer-level NTG results using the self-report approach (SRA) and case study reviews. We present the SRA NTG ratio based only on free-ridership, followed by the SRA NTG ratio with the addition of participant spillover. Participant spillover was small, but this is expected given the holistic nature of the program that seeks to provide comprehensive support for energy projects. After weighting by gross kWh savings and the case study review, the average NTG ratio for surveyed projects was 93.1 percent.

Table 9-1. Colorado Process Efficiency NTG Ratio

Source	Score
Current Deemed NTG ratio	0.9
SRA NTG ratio (1 - free-ridership)	0.891
SRA NTG ratio (1 - free-ridership + participant spillover)	0.892
Final NTG ratio (after case study adjustments) (1 - free-ridership + participant spillover)	0.931

While participants may have implemented additional projects through the program, NTG questions were only asked in regards to projects installed since January 1, 2011 to minimize recall bias. Overall net-to-gross results were weighted by customer's individual kWh savings.

Next we provide the approach used to calculate free-ridership and the results, detailing each step of the estimation process. Then we discuss the spillover methodology and results. This is followed by the additional triangulation research.

9.3 FREE RIDERSHIP METHODOLOGY AND RESULTS

We estimated free-ridership using a methodology based on the California self-report framework for standard NTG projects¹⁴, with some modifications. The standard NTG analysis specified in the California framework uses three primary sources of information to estimate NTG: program files and information; participant (a key decision-maker is the respondent) surveys; and vendor (participating trade ally) surveys.

The participating customer survey asked highly structured questions about actions that would have been taken in the absence of the program. The survey questions for each participant were structured based on information contained in the program files. Respondents were first asked a series of questions to establish project context. They were then asked to rate the significance of different factors and events that may have led to their decision to install the energy efficient improvements at the time they did, including questions on the age or

¹⁴ 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.



condition of the equipment, type of project, recommendations received, business policies related to equipment purchases, and previous experience with Xcel Energy programs. Next, participants were asked to rate the relative importance of program influences vs. non-program influences in their decision-making processes.

Respondents were also asked a number of questions to assess the impact the program had on the timing, quantity, and efficiency level of the measures 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? Did the program impact the efficiency of equipment installed, and if so, by how much?

The preliminary free-ridership rate is calculated using three scores representing responses to one or more questions about the decision to install a program measure on a ten-point scale where ten represents the highest level of influence. These scores are:

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 that time. Program influence through vendor recommendations is also captured in this score when the customer said the vendor was influential in their decision. In these cases we attempted to interview the influential vendor and, if successful, incorporated their responses into the timing and selection score.

A **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. A unique aspect of this score is that the overall program influence score is reduced by half if the respondent said 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 the same 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. This score also accounts for whether the participant would have installed a reduced quantity of equipment or less efficient equipment in the absence of the program.

The preliminary free-ridership rate is one minus the average of these three scores divided by ten, as shown in Figure 9-1 at the end of this free-ridership section. This score was then adjusted for the importance of previous experience with Xcel Energy programs in the participant's decision-making process for the final free-ridership score. A free-ridership rate was calculated for each participant included in the study.

9.3.1 Timing and Selection Score

The average Timing and Selection score was 9.99 out of ten, weighting by kWh savings. All but one participant rated the importance of at least one program-related factor a ten out of ten in their decision to implement. On average, the availability of the program rebate rated the most important of all program-related influences (9.0 out of ten), followed by the information



provided through an Xcel Energy study or technical assessment and recommendations from Xcel Energy staff (8.8 out of ten for each).

Three of the four surveyed participants indicated that a vendor's recommendation was influential in their decision to the install projects through the program (using the criteria presented in Figure 9-1); however, all three said they could not give us contact information for their vendor. As a result, we were unable to conduct any influential vendor surveys and incorporate vendor responses into the timing and selection score.

Table 9-2. Timing and Selection Score Results

Freeridership Component	Overall Score (weighted by kWh)
Timing and Selection Score	9.99

9.3.2 Program Influence Score

The Program Influence score was the lowest of the three attribution scores, with an average of 5.71 out of ten, weighting by kWh savings. When asked to rate the importance of the program compared to the most important non-program related factor in their decision to install the equipment, participants gave an average rating of six for the program and four for the non-program factors.

One participant said they heard about the Process Efficiency program only after they had decided to purchase or implement the projects rebated through the program. As discussed above, the Program Influence score is halved for those who heard about the program only after they made the decision to purchase the equipment. However, this participant also said they were aware of other Xcel Energy programs and actively participated in them during the decision-making process before learning about the specific Process Efficiency program. Because the customer was aware that Xcel Energy offered incentives for the equipment installed prior to deciding to purchase, it was not appropriate to make this type of adjustment to this customer's Program Influence score.

Table 9-3. Program Influence Score Results

Freeridership Component	Overall Score (weighted by kWh)
Program Influence Score	5.71

9.3.3 No-Program Score

The average No-Program score was 8.20 out of ten, weighting by kWh savings. This score was increased because we accounted for partial free-ridership. The California framework defines partial free-ridership as when, in the absence of the program, the participant would

have installed less equipment or something more efficient than the program-assumed baseline efficiency but not as efficient as the item actually installed as a result of the program.

Three of the four participants indicated that they would have most likely installed more efficient equipment than required by code, but less efficient than what they installed through the program in the absence of the program. For these customers, we adjusted their response to the likelihood of installing the same equipment in the absence of the program (N5) by half, effectively increasing their No-Program score by the same magnitude.

Only one participant had a No-Program score of less than eight out of ten. This respondent indicated that they would have been “extremely likely” to install the exact same equipment in the absence of the program, 12 months later than they implemented through the program. However, the customer said this was the case because “high efficiency had become the standard.” The customer reported later during the interview that they did have a corporate energy plan, but they had not had this plan in place prior to participating in the program. Because the corporate energy plan was established since they began participating in the program, and is most likely the main driver of the low No-Program score, the evaluator team considered making an adjustment for this customer. Because the overall customer-level NTG ratio of .92 is a fairly accurate representation of program attribution based on an in-depth review of the interview, we did not adjust this score.

Table 9-4. No Program Score Results

Freeridership Component	Overall Score (weighted by kWh)
No Program Score	8.20

9.3.4 Previous Program Experience Adjustment

Finally, we examined how participants’ ranked the importance of past participation in any Xcel Energy demand side management program in their decision to implement the energy efficient projects. In the current California NTG ratio battery, this factor is not included in the calculated NTG ratio, although a question is asked about the importance of previous program participation. Instead, we incorporated the Massachusetts standardized methodology for including previous program participation in the NTG ratio, as it 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. 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 zero to ten with ten being “very important”), we reduced their free-ridership rate by 75 percent (two of four respondents). If they rated the importance of their past experience with the program a seven or an eight, we reduced their free-ridership rate by



37.5 percent (one of four respondents). Lower ratings of the importance of previous program experience did not receive any adjustment (one of four respondents). This adjustment resulted in the final calculated free-ridership rate detailed in the last step of Figure 9-1.

Table 9-5 shows the final SRA NTG ratio based on free-ridership after the adjustment for previous program experience. The adjustment for previous program experience decreased the overall free-ridership rate from 20.3 percent to 10.9 percent, which increases the SRA NTG ratio based on free-ridership from 79.7 percent to 89.1 percent (9.4 percent difference).

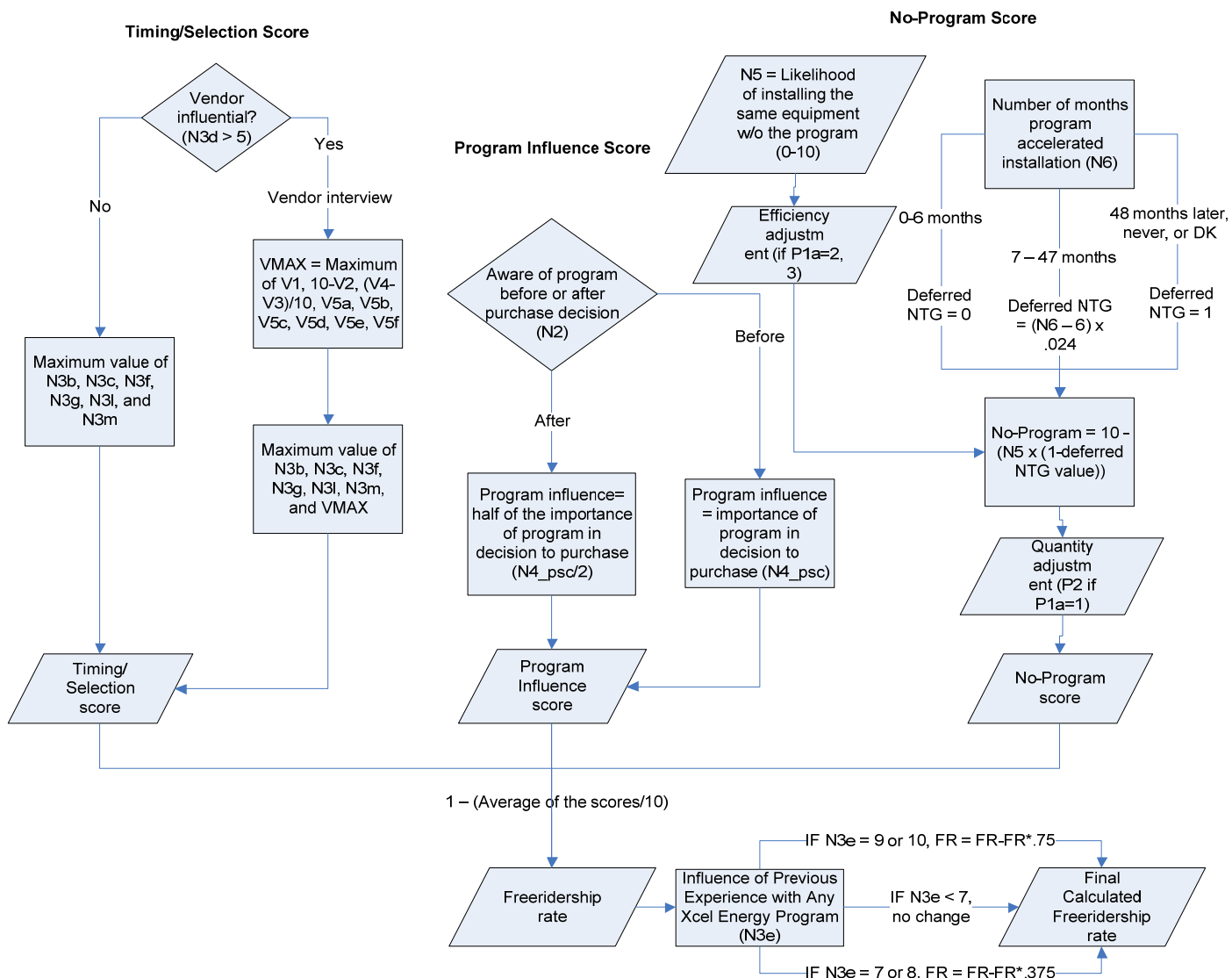
Table 9-5. Preliminary SRA NTG Ratio (Excluding Spillover)

Program	SRA NTG Ratio (1 – free-ridership, not adjusting for previous program experience)	SRA NTG Ratio (1 – free-ridership, adjusting for previous program experience)
Colorado Process Efficiency Program	0.797	0.891

9.3.5 Free-ridership Flowchart

Figure 9-1 below summarizes the estimation process of the SRA NTG ratio as presented above.

Figure 9-1. Self-Report Free-ridership Algorithm Flowchart



9.4 SPILLOVER METHODOLOGY AND RESULTS

In addition to the California framework (which factors only free-ridership into the NTG calculation) we also examined spillover to calculate the NTG 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. Only participant spillover was quantified for the Colorado Process Efficiency program. Participant spillover is limited to “like” spillover—equipment or services of the same type due to program influences—because this is the most accurate, and thus defensible, quantification of spillover. Participant unlike



spillover— equipment or services of a different type than that received through the program— was captured in the surveys and is characterized, but is not part of the NTG calculation.

9.4.1 Participant Like Spillover

Participant “like” spillover occurs when a customer installed equipment or conducted services through the program within 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 installed through the program that were made *without* any technical or financial assistance from the program, but were influenced by the program. Because California does not allow for spillover to be included in net savings estimates, we followed the Massachusetts analysis methodology for estimating “like” 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 because we rely on customer self-reports for the quantity and efficiency of any measures installed. Because of this challenge, we used a conservative approach and reported only those measures installed outside the program that were of the same type and efficiency as the ones installed through the program. In addition, we specified that these measures must be installed at locations that are served by Xcel Energy and reviewed responses to remove any measures installed outside of Xcel Energy territory¹⁵. 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 to use the estimated program savings for that measure to calculate the customer’s “like” spillover savings.

We were only able to identify like spillover savings for one customer. The respondent reported installing “like” motors on their own without any financial assistance from Xcel Energy (25 percent of what they installed through the program). When asked to rate agreement with the statement “my past experience with Xcel Energy’s programs influenced my decision to install or implement these improvements on my own,” the respondent gave a rating of seven on a zero to ten scale with zero being “strongly disagree” and ten being “strongly agree.” When asked why they did not go through an Xcel Energy program, the respondent said simply “we were replacing the equipment anyway.” A second participant said they installed additional HVAC controls similar to what they installed at one particular facility; however, we were unable to substantiate this similar installation in the program tracking data. Consequently, we could not confidently attribute “like” spillover savings for this customer.

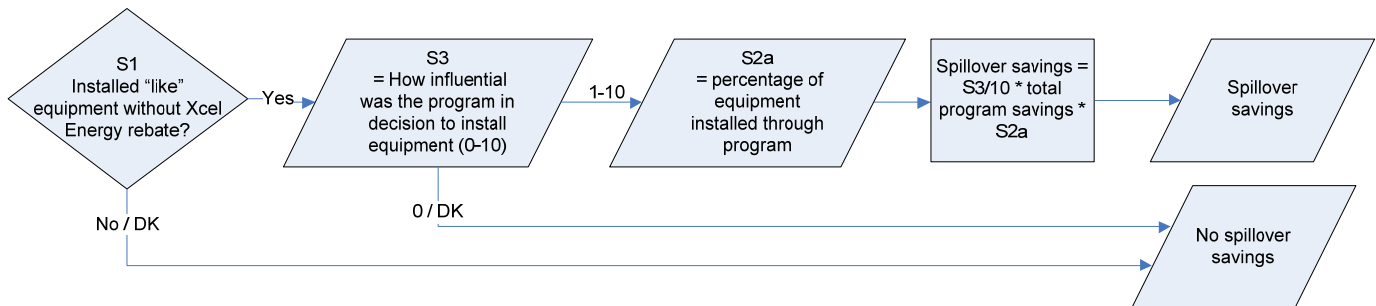
¹⁵ After review, we did not remove any records from analysis.

Table 9-6. Preliminary SRA NTG Ratio Including Spillover

Program	Participant-reported Spillover	SRA NTG Ratio with Participant Spillover
Colorado Process Efficiency Program	0.001	0.892

Using the method outlined in Figure 9-2, the customer surveys identified a 0.1 percent overall participant spillover rate after weighting by kWh savings. This low participant “like” spillover rate is not surprising given the holistic design of the Process Efficiency program and the program’s bonus incentive structure, both which motivate customers to make energy efficient improvements through the program whenever possible.

Figure 9-2. Customer “Like” Spillover Savings



9.4.2 Participant “Unlike” Spillover

Participant “unlike” spillover refers to additional energy-efficient equipment not of the same type received through the program installed by a customer due to program influences without any financial or technical assistance from the program. While we did not attempt to quantify the extent of “unlike” spillover, the decision-maker survey included several questions to qualitatively assess evidence of “unlike” spillover.

The customer participant survey revealed some limited evidence of “unlike” spillover. While only four customers qualified for the free-ridership and like spillover survey questions, all eight participants surveyed were asked about other energy efficient improvements they have made without the assistance of Xcel Energy. Two of the eight participants surveyed reported installing other “unlike” energy efficiency improvements in the Xcel Energy service territory without the financial assistance of Xcel Energy since participating in the Colorado Process Efficiency program. Improvements included motors, lighting (T12s to T8s), occupancy sensors, a plate heat exchanger, and a building automation system (BAS).

To assess the impact of participants’ participation in Xcel Energy’s programs on their decision to implement these improvements, the participant survey asked respondents to rate their agreement with the statement, “My past experience with Xcel Energy’s programs influenced

my decision to install or implement these improvements on my own.” Both respondents gave a rating of ten, with zero being “strongly disagree” and ten being “strongly agree.”

9.5 CASE STUDY FINDINGS

As mentioned above, calculated SRA NTG ratios were triangulated with case study reviews for each surveyed participant. Case study activities for the Colorado Process Efficiency program consisted of a thorough review of participant survey responses beyond those used in the SRA free-ridership and spillover calculations by the evaluation team and a review of individual survey responses and SRA scores by program staff for consistency. Based on these reviews, the evaluation team and Xcel Energy identified customers warranting additional discussion with program and account management staff.

The additional case study review and discussions with program and account management staff resulted in an upwards adjustment of the NTG ratio for one customer. This adjustment increased the final NTG ratio (including spillover) from 89.2 percent to 93.1 percent.

Table 9-7. Final NTG Ratio Including Spillover

Program	SRA NTG Ratio w/ Participant Spillover	Final NTG Ratio w/ Participant Spillover (with case study adjustments)	Surveyed Savings	
			kWh	Percent of Total
Colorado Process Efficiency Program	0.892	0.931	6,730,181	100.0%

9.5.1 Additional Participant Feedback

In addition to the close-ended SRA survey questions used to calculate the NTG ratio, participants were asked to tell us in their own words what influence the program had on their decision to purchase and install the efficient equipment. Participants’ responses highlighted the importance of the Process Efficiency program in identifying energy efficiency opportunities, selecting equipment, gaining buy-in from upper management, and making investment projects feasible and cost-effective. These comments are consistent with the high SRA attribution scores.

- *“It was significant in the decision making because it allowed us to verify with upper management the payback associated with investment. It allowed us to incorporate additional projects with the rebates we received, and it helped us, and continues to help us achieve, our go-green corporate goals. We have been awarded two years in a row the top company in the Process Efficiency program.”*
- *“The information that was provided by Xcel [Energy] gave some good guidelines for equipment selection, so using those we made our purchase selections. It gave us some broader insight into the purchase of that type of equipment.”*



- *"The assessment that was performed looked at a more detailed level than we would have done with internal staff. They looked at motors, building, processes, and broke them down into their individual components, looking at return on investment for specific pieces of equipment instead of on a plant-wide level. This was the level of detail they provided through the studies."*
- *"I think it gave us the impetus to search out many opportunities that would be there by providing incentives to do the projects."*

The participant survey included a couple of other questions relating to the impact of the program on customers' decision-making processes regarding energy efficient installations. All four participants surveyed indicated that their company's participation in the Process Efficiency program had a significant influence in the planning, design, and installation of the energy efficiency improvements evaluated. Also, all three participants who received implementation rebates through the program reported that the program rebate was included as part of their capital spending proposal to get the project approved. When asked how important the program rebate was in getting the project capital approved on a zero to ten scale with ten being "very important," two respondents gave a rating of eight while the other respondent gave a rating of 7. This feedback further substantiates the high levels of program attribution reflected in the SRA NTG scores.

Additionally, responses from participants suggest that the program had an influence on corporate policy relating to energy use. Three of the four participants surveyed did not have an energy conservation or sustainability policy in place with goals for reducing energy use prior to participating in the Process Efficiency program. Two of these three customers have since adopted a conservation or sustainability policy. While these findings do not directly speak to the program's influence on specific energy efficiency implementations, they do suggest that the program has impacted energy conservation plans for these companies.

9.5.2 Discussions with Program and Account Management Staff

Upon review of customer responses to the participant survey, the evaluation team and Xcel Energy staff agreed that the decision-making processes for one customer needed to be discussed further with their account representative. This customer's calculated NTG ratio was driven down solely by their Program Influence score (two out of ten); whereas their Timing and Selection and No-Program scores were both ten. The low Program Influence score resulted from the customer attributing a much higher relative importance of the age or condition of the existing equipment on their decision to install energy efficient equipment than the influence of the program (eight of ten compared to two of ten). While the age or condition of the old equipment may have been the impetus for replacing the old equipment, it does not fully explain why the customer chose to install high efficiency equipment over standard efficiency. The vast majority of the other customer's responses suggested higher program attribution than their final calculated NTG ratio indicated.

As part of the case study approach, the evaluator interviewed the Xcel Energy account representative who has been closely involved with the customer's participation in the Process Efficiency program to gain more insight on the program's influence in the customer's decision-making process. The account representative reported that the respondent we spoke with was



the primary customer contact for the projects in question, but that he/she was not the person they first discussed the Process Efficiency program with. According to the account representative, this firm was considering replacing some of their motors with more efficient equipment prior to getting involved with the Process Efficiency program, but that the technical assistance provided by the program was instrumental in the customer's equipment selections. This feedback is consistent with the respondent's open-ended responses. In addition, the account representative thought that while the program rebate was not the main driver for the customer looking to install new equipment, the rebate was still very important in "selling" the project to upper management. Finally, he/she reported that the Process Efficiency program has been particularly impactful in driving organizational changes around energy conservation for this particular customer.

With these considerations in mind, we adjusted the NTG ratio for this customer upward from 73.3 percent to 86.7 percent. The magnitude of this adjustment reflects an average of the customer's original calculated score (73.3 percent) and the calculated score removing the outlier Program Influence score (100 percent). We feel that the adjusted NTG ratio is a more accurate reflection of program attribution based on the customer's responses and feedback from their account representative.

9.6 ADDITIONAL TRIANGULATION RESEARCH

This section summarizes additional findings from nonparticipant surveys, qualitative trade ally interviews, and benchmarking information relating to program free-ridership and spillover.

9.6.1 Nonparticipant Installations of Eligible Equipment

We interviewed a total of six nonparticipants, including three customers who would likely be eligible for the program and three customers who would likely not be eligible for the program under the current minimum energy savings potential requirement. One of the eligible nonparticipants reported adding lighting controls and implementing recommissioning while another reported installing energy efficient lighting in the past three years. It is unclear whether these specific actions were implemented through an Xcel Energy program; however, one eligible customer reported having recently participated in both prescriptive and custom Xcel Energy programs. In addition, all three eligible nonparticipants said they had participated in an Xcel Energy on-site assessment or study in the past three years. All three of the currently ineligible customers reported having implemented energy efficient improvements in their facilities in the last two years. Installations included lighting equipment, motors, variable-speed drives, lighting controls, and HVAC controls. One of these three currently ineligible respondents reported participating in Xcel Energy's Motor and Drive Efficiency program.

While findings from the nonparticipant interviews cannot validate self-report free-ridership results from participants, the fact that currently eligible nonparticipants have apparently taken few energy efficiency actions on their own without the assistance of Xcel Energy is consistent with the high NTG ratio for the program.



9.6.2 Participating Trade Ally Interviews

In addition to the participant and nonparticipant customer surveys, we explored the program's effect on customer decision-making processes through qualitative interviews with participating trade allies. We interviewed six trade allies who have worked with the Process Efficiency program in some capacity, mostly secondary Phase 2 scoping study providers.

Feedback from trades is consistent with the high program attribution scores from customer self-reports. Several trades stressed the difficulty in getting projects approved from the “bottom-up;” that ideas for projects typically get declined somewhere higher on the customer's decision-making chain than they are able to reach. A couple of respondents commended the program's ability to engage upper management from the outset to avoid chinks in the decision-making chain. When asked what factors drive customer decision-making processes regarding implementing energy efficient equipment or practices, most respondents pointed to return-on-investment or payback periods. Generally, customers look for a payback period of three years or less for most capital improvements. One trade ally added that this priority on payback underscores the importance of feasibility studies like those provided through the Process Efficiency to show customers evidence of return-on-investment. This feedback suggests that the program is designed and operating to address the primary barriers for industrial customers.

9.6.3 Peer Utility Benchmarking

As part of the benchmarking review of similar programs offered in the U.S., we researched NTG ratio estimates and examined whether the NTG ratio for each program was a deemed value or whether it was based on an evaluation of that program. Table 9-8 summarizes the NTG estimate findings from the benchmarking review. We found free-ridership based on evaluation research for two programs, with point estimates of 14 percent and 13 percent, respectively. Previous evaluations for one of these programs estimated spillover to be relatively minor. These findings are in-line with the overall Process Efficiency SRA NTG results, substantiating the reasonableness of the program attribution estimation while also indicating that Xcel Energy's program may be working particularly well in terms of program attribution.

Table 9-8. Benchmarking Study NTG Findings

Organization	Program	Impacts Information
Energy Trust of Oregon	Production Efficiency	2011 free ridership is 14% for electric measures and 20% for gas measures. Spillover is estimated to be minimal per past evaluations.
Rocky Mountain Power, Utah	Energy FinAnswer	2011 Annual Report shows NTG of 87% for all measure groups; this does not include spillover.



9.7 CONCLUSION

The NTG research indicates a high level of program attribution with a calculated program-level NTG ratio of 93.1 percent. Participant responses indicate that not only has the program rebate influenced their decision-making process, but that the technical assistance and information provided through the program has also been very valuable. In particular, the research shows that the Xcel Energy Process Efficiency program has been highly influential in identifying energy efficiency opportunities, helping customers select energy efficient equipment, gaining buy-in from upper management early on in the decision-making process, and overcoming financial barriers. In addition, feedback from customers indicates that the program has influenced corporate policy regarding conservation.



APPENDIX A: PROGRAM STAFF INTERVIEW GUIDE

A.1 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, implementation contractors, trade allies, customers, organizations, peer utilities
 - roles and responsibilities of these other persons
 - success of interactions; suggestions for improvements

A.2 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) How has the program design changed in the past year? Why did you make these changes? How is the program design changing in 2012-2013?



- 3) 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?
- 4) Are there similarities between the projects or customers that participate in the program, or is each project/customer unique?
- 5) How does the type of equipment being purchased and installed through the program vary? Why do you think there is this variation?
- 6) How do you define your program participants? Are your participants typically new to Xcel Energy CIP/DSM programs?
- 7) How do you define nonparticipants? What seems to lead to lost opportunities?
- 8) [PROCESS EFFICIENCY] What are the target markets within the industrial sector for the program? Has this changed in any way?
- 9) [MN COOLING EFFICIENCY] What are the target markets within the commercial sector for the program? How is this changing?
- 10) How do you identify prospective customers for the program?
- 11) What marketing activities are being used to reach the different target markets? How have these activities changed in the past year? How effective have each of these methods been in identifying and enrolling potential participants? Why?
- 12) 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?
 - [PROCESS EFFICIENCY] Do any customers drop out of the program after conducting the first one or two phases? How many? If so, why?
 - In your opinion, do the current marketing efforts adequately reinforce customers' reasons for participation and/or minimize reasons for nonparticipation?
- 13) 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.)*



A.3 PROGRAM OPERATIONS

- 1) What are the participation steps from the customer's perspective? Can customers enter the program via various methods (i.e. study-driven)? Have these changed over time?
- 2) What is the overall quality/accuracy of the customer applications that you receive? Have you taken any steps recently to improve the quality of these applications? What improvements are needed but currently unavailable?
- 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) [PROCESS EFFICIENCY] Describe your communications and working relationships with the program's implementation contractor. How does the program utilize the EnVINTA opportunity assessment tool? Have you received any positive or negative feedback on the EnVINTA tool?
- 5) Describe your communications and working relationship with trade allies. What support is provided through the program to trade allies? (*Probe to see if systematic or ad-hoc.*) In what areas could this be improved?
- 6) [MN COOLING EFFICIENCY] How are trade allies recruited into the program? What makes your trade allies unique in their offerings due to the program? (Discuss both HVAC contractors and distributors)
- 7) How are you seeing the market transform through your trade allies and customers?
- 8) What aspects of the program implementation are working well? Which are not working well?
- 9) Do the incentive levels seem appropriate? If not, why not? What, if any, changes in the incentive levels do you think may be needed? (*Probe about recent changes in incentive levels as relevant by program.*)
- 10) What do you see as future challenges for the program?
- 11) How are participants, non participants and marketing leads 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?



A.4 EVALUATION

- 1) What do you hope to learn from the evaluation?
- 2) *(Probe if not already mentioned)* Do you have any specific questions that you want to make sure are included in primary data collection activities with market actors? Are there any program design changes that you are considering, that this evaluation could help to inform? Probe about trade ally interviews, participant and non-participant surveys, and the benchmarking study.
- 3) *(Process Efficiency)* How do you think vendors/customers might feel threatened through trade relations aspects of the program? How do you envision a holistic approach towards active participants and vendors for this evaluation? What is the rationale for keeping customers unaware of the program?

A.5 INPUTS FOR LOGIC MODEL.

This next series of questions will be used to supplement the 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.

A.6 PROCESS FLOW MAPS

1) *(if not already addressed during interview)* In what ways have program processes changed since the existing program process flow map was created? Are there additional, or fewer, steps from the participant's viewpoint? Are there additional, or fewer, steps from a program staff viewpoint? Has the role of the (IF COOLING EFFICIENCY: trade allies; IF PROCESS EFFICIENCY: implementation contractor) changed over time?

A.7 OTHER SUGGESTIONS FOR IMPROVEMENT

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



APPENDIX B: TRADE ALLY INTERVIEW GUIDE

B.1 COMPANY PROFILE

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] (IF PROCESS EFFICIENCY: energy equipment and/or services) to the commercial and industrial customer market? (Examples include manufacturer, manufacturer representative, wholesale distributor, engineering firm, contractor, energy services/management firm, etc.)

F2. Could you please tell me specifically the types of [program] equipment or services you sell/specify for commercial and industrial customers? (Probe for the specific types, sizes and efficiency levels as applicable.)

F3. What percentage of your commercial/industrial business is:

Planned Equipment Replacement (for currently operating equipment)? _____%

Failed/Emergency Equipment Replacement _____%

New Equipment Purchases (for new buildings or processes) _____%

Other (specify) _____%

F4. [COOLING ONLY] What percent of the projects that you completed in the last 12 months were for smaller or medium-sized businesses in terms of energy usage versus large businesses? DEFINE CONSUMPTION RANGE TO RESPONDENT [in case don't know consumption, use definition of employees. Small have 100 or less employees. Medium businesses have over 100 employees. Large businesses are those that have an Xcel Energy account manager.]

F5. (IF PROCESS EFFICIENCY) What percent of the projects that you completed in the last 12 months were for large industrial companies? (IF NEEDED: Large businesses are those that have an Xcel Energy account manager.)

F4. (IF PROCESS EFFICIENCY PARTICIPATING CONTRACTORS) What percent of your annual business revenues are related to Xcel Energy's Process Efficiency Program? Other Xcel Energy programs?

B.2 PROGRAM AWARENESS AND INVOLVEMENT (PARTICIPATING CONTRACTORS ONLY)

P1. Could you describe for me your participation in [program]? Probe for reasons trade 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)

B-1



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, on-line advertising, or billboards (morning, evening, weekend,...etc.

Xcel Energy Website

Other Xcel Energy marketing efforts, such as a newsletter, email or mailing

Business Colleague

Existing Business Customer

New Business Customer

Other _____

Don't know/unsure

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

P4a. What is the primary benefit(s) you receive from [program]?

P4b. When was the last time you completed a project through/sold equipment through the program?

P4c. (IF HAVEN'T COMPLETED A PROJECT/SOLD EQUIPMENT IN LAST YEAR) Why have you not completed a project through the program recently?

P5. How do you receive program communications? Do you feel there are adequate program communications? Are any changes needed? How would you like to receive communications about the program?

P5a. Are there any aspects of the [program] that are unclear to you? What is unclear?

P6. 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)?

P7. What additional support could the program offer that you would find beneficial? Are there any additional tools that the program should offer? (IF PROCESS EFFICIENCY: What level of support would you expect from a program such as Xcel Energy's Process Efficiency program?)

P8. 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.3 CUSTOMER INTERACTIONS

C1. (IF PROCESS EFFICIENCY) Do you usually have an existing relationship with the customer(s) who participated in the Process Efficiency program prior to your participation in the program? If yes, what types of work have you done for them?

C1a. Do you actively promote [program]? If yes, how? What do you tell customers? (IF DON'T ACTIVELY PROMOTE: Do customers ever ask you about the [program])?

C1b. [COOLING EFFICIENCY ONLY] What percent of your customers already know about the program before you tell them about it? Has customer program awareness increased or decreased in the past 12 months? Why do you think this is?

C1c. (PROCESS EFFICIENCY: For the projects you scope for the Process Efficiency 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?

C2. (COOLING EFFICIENCY ONLY) What are the primary reasons customers typically want to install program-qualifying equipment/conduct program-eligible services?

C2a. (COOLING EFFICIENCY ONLY) 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 energy costs
- Helps the environment
- Shows good corporate citizenship
- Meets payback criteria
- Impact on company financials
- Recommendation of manufacturer, supplier, contractor, etc.

C3. 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?

C3a. And why do you say that? (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). Characterize customer participation barriers (e.g., incremental cost of efficient high efficiency equipment, too long of a payback period, rebate application process, etc.) to the extent possible. If not mentioned,



probe specifically about the effect of the slower economy on customers' decision to participate in program.)

C4. (COOLING EFFICIENCY ONLY) What are the primary reasons customers typically do not want to participate in the program? Do these reasons vary across different customer segments? (PROBE: small vs large customers)

C5. (COOLING EFFICIENCY ONLY) 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.

C6. (COOLING EFFICIENCY ONLY) What do you think are the main benefits your customers receive by participating in [program]?

C7. (COOLING EFFICIENCY ONLY) Are there other opportunities to promote energy-efficient products and services to business customers that the program is not currently addressing?

C7. (COOLING EFFICIENCY ONLY) Should the program include other types of equipment that currently are not eligible?

C8. (COOLING EFFICIENCY ONLY) Would you like to see the program do more direct or specific marketing to customers eligible for the program? If yes, what kind of marketing would you like to see added?

B.4 PROGRAM PROCEDURES

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, if anything? What is working well from your point of view?

E1. (IF INVOLVED WITH APPLICATION PROCESS IN E2) On a scale of 1 to 5 where 1 is 'very difficult' and 5 is 'not at all difficult', how would you rate the difficulty of completing Xcel's program applications? Why do you give this ranking? How would you like to see the application process improved?

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

B.5 MN COOLING EFFICIENCY SPECIFIC QUESTIONS

CE1. Do you receive incentives through participating in the Cooling Efficiency program? [IF YES] How do these incentives affect the cooling equipment you sell?

CE2a. Have you rebated DX units? [IF YES] What has been the impact of the trade incentive on rebating these units?



CE2b. How has the trade incentive affected your stocking practices of DX units?

CE3a. Minnesota offers rebates for conducting a Cooling Study (explain in detail if necessary). Have you been involved with any energy saving studies rebated by Xcel Energy?

CE3b. [IF CE3a=YES] Please describe your role with the study.

CE3c. [IF CE3a=YES] In your opinion, how can the program encourage more participation in the Cooling Studies? What benefit do customers receive from conducting a study?

CE4a. Do you work on multi-family buildings?

CE4b. [IF YES] Do the owners view energy efficiency differently from other business customers? How?

CE4c. How does that affect sales of high efficiency equipment to these owners? What would make them more interested in high efficiency as an option?

B.6 NONPARTICIPATING CONTRACTORS

NP1. How well would you say you understand, or how familiar are you with Xcel Energy's [program]?

NP2. From your point of view, how does the program work?

NP3. Are there any aspects of the [program] that are unclear to you? What is unclear?

NP4. Have any of your customers participated in the [program]?

NP5. (IF NP4= YES) Was your company involved in their program participation in any way? Probe for details.

NP6. (IF NP4 = NO) Why hasn't your company been involved in the [program] to-date? (Probe to see if no relevant projects, other companies got the work, other).

NP7. (IF NP4 = NO) Would you like to complete projects for customers in this program? Why is that?

NP8. What are your impressions of the overall program design? Do you think it serves both customers and equipment/service vendors well?

NP9. Have you discussed the program with your customers or other vendors? Regarding what issues? What do you want to know? What do you tell them?

NP10. Is there anything about the program that you would like more information about?



NP11. Do you think the program could benefit by listing potential implementation vendors on the program's webpage? How so?

B.7 MARKET TRANSFORMATION

MT1. How would you say Xcel Energy's program (IF COOLING: rebates) affects your sales/installations of program-qualifying equipment? Since the program began, would you say that your sales/installations have increased: significantly, somewhat, a little, hardly at all?

MT2. (COOLING EFFICIENCY ONLY) Using a 0 to 100 percent scale, in what percent of total sales situations did you recommend high efficiency equipment/services before you learned about the program?

MT3. (COOLING EFFICIENCY ONLY) And using the same 0 to 100 percent scale, in what percent of total sales situations do you recommend high efficiency equipment/services now that you have worked with the program?

MT4. (COOLING EFFICIENCY ONLY) Approximately what percentage of your sales to Xcel Energy customers are energy efficient models that qualify for incentives from the Xcel Energy program?

MT5. (COOLING EFFICIENCY ONLY) Of the energy efficiency projects you do that would qualify for the program, approximately what percentage does not apply for the incentive? Why?

MT6. What direction do you see the nonresidential 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? Please describe.

MT7. Do you expect your sales/specifications/installations of program-qualified equipment/services 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.

B.8 CONCLUSION (PARTICIPATING CONTRACTORS ONLY)

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

Table C-1. Participant Cooperation Rate

Sample Disposition	Colorado Process Efficiency
Sample Size	15
Bad number	0
Ineligible - Respondent no longer at company	0
Ineligible - Doesn't recall participation	0
Adjusted Sample Size	15
Hard Refusal	0
Soft Refusal ¹	1
Incompletes (partial interviews)	0
Unavailable for duration	0
Language barrier/non-English	0
Active ²	4
Active, but on hold (8 attempts)	2
Completed Surveys	8
Cooperation Rate³	53.3%

¹ Attempts were made to convert all soft refusals.

² An average of 6.3 contacts per active case have been made to attempt to complete the interview.

³ Number of completed surveys divided by Adjusted Sample Size.

The complete list of survey modules follows:

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

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 Tetra Tech has had a chance to examine the participant database.



[PROGRAM] Program name

- 1 Process Efficiency Program (MN)
- 2 Process Efficiency Program (CO)

[PHASE] Highest stage of participation (as defined by MOU signed)

- 1 Phase 1 (only completed EnVINTA kick-off session)
- 2 Phase 2 (Scoping)
- 3 Phase 3 (Implementation)

[PTYPE] Type of participant

- 1 Completed project/installed energy-efficiency measure(s) since January 1, 2011 ("active participant")
- 2 Completed project/installed energy efficient measure(s) prior to January 1, 2011 but have not completed project/installed energy-efficient measure(s) since January 1, 2011 and are not currently participating in a project or study ("dormant participant")
- 3 Have not completed any projects/installed energy efficiency measures (partial participant)

[STUDY] Completed scoping study

- 0 Scoping study NOT completed
- 1 Scoping study completed

[STUDY INCENTIVE] Subsidy amount for scoping study

[ASSISTANCE] Rebate, incentive, or technical assistance received through program

[IF PHASE = 1 AND PTYPE = 3] a free business practice benchmarking study

[IF PHASE = 1 AND PTYPE <> 3] a free business practice benchmarking study and rebate(s) for **[MEAS_SUM]**

[IF STUDY = 1 AND PTYPE = 3] a free business practice benchmarking study and a subsidized technical assessment to identify energy-saving opportunities

[IF STUDY = 1 AND PTYPE <> 3] a free business practice benchmarking study, a subsidized technical assessment to identify energy-saving opportunities, and a rebate for **[MEAS_SUM]**

[ADDRESS] Address(es) 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:

Mike Morris – Minnesota Process Efficiency

Bruce Nielson - Colorado Process Efficiency

[DATES] Date(s) measures were implemented through the program



[REBSUM] Sum of rebate dollar amounts for measures received through the program

[BONUS] Flag to note if customer received bonus from Xcel Energy

[MEAS_SUM] Summarized description of all high efficiency equipment implemented or service performed in sample period, for use outside the Net-to-Gross sections.

[EEMEAS descriptions] Detailed descriptions of measures implemented through the program in sample period for a specific EE_MEAS (for use inside net-to-gross section)

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]

I'm with Tetra Tech, an independent research firm. I am calling to learn about your experiences with Xcel Energy's **[PROGRAM]**.

I'm not selling anything; I'd just like to ask your opinion about this program. You may have already 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 20 and 25 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, and uncover possible ways to improve the program.)

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

(Timing: This survey should take between 20 and 25 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 and not revealed to anyone unless you grant permission. If you would like to talk with someone from Xcel Energy about this study, feel free to call **[program contact and phone number]**. *[If needed, if you'd prefer to call someone you already have a working relationship with at Xcel Energy, please reference [program contact and phone number] when speaking with your contact to help facilitate a response]*)

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

Identification of Decision-Maker

C0a **[IF MINNESOTA PROCESS]** To confirm, as part of your participation in the Process Efficiency program, did your firm participate in a free one-day business benchmarking session (also known as the one-day EnVINTA session) that compared your energy usage to other similar businesses?

- 1 Yes
- 2 No
- D Don't know
- R Refused

C0b **[IF MINNESOTA PROCESS]** Again, to confirm, as part of your participation in the Process Efficiency program, did your firm receive a scoping study or assessment to identify energy saving opportunities?

- 1 Yes
- 2 No
- D Don't know
- R Refused

C1a In summary, program records indicate that you have participated in the program and have received **[ASSISTANCE] (IF BONUS = 1:** as well as an achievement or optimization bonus from Xcel Energy).

Is this correct?

- 1 Yes (SKIP TO C5)
- 2 Information is incorrect [SPECIFY WHAT IS INCORRECT] (SKIP TO C5)
- 3 Does not recall participation



C2 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 (*GO TO C3*)
- D DON'T KNOW (*GO TO C3*)
- R REFUSED (*TERMINATE*)

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

- 1 Don't remember (*RECORD ANY COMMENTS, TERMINATE*)
- 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 Are you the person most knowledgeable about your organization's decision to participate in Xcel Energy's **[PROGRAM]**?

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

C6 Who else at your company was involved in the decision of whether or not to participate in the **[PROGRAM]**?

(PROBE: IF MORE THAN ONE DECISION MAKER, ASK 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, C5<>2, CONTINUE; ELSE
TERMINATE AND DIAL ONE OF DECISION MAKERS IN C6)

Installation Verification

I1A (IF PTYPE = 3 SKIP TO PA_INTRO) Is/are the high efficiency equipment you
installed through the program still installed and operating at your business?

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

(ONLY ASK IF I1a = NO. ELSE SKIP TO I4)

I1B Which measure(s) is/are not installed?

(RECORD OPEN-ENDED RESPONSE)

I2 Was it/Were they ever installed?

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

I3 Do you plan on implementing this/these processes/ improvements at one of your
facilities in Xcel Energy's service territory?

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



I4 Why isn't it currently operating?

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

Source of Program Awareness/Social Media

PA1 How did you learn about Xcel Energy's **[PROGRAM]**? (DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 Through my Xcel Energy account manager
- 2 Another Xcel Energy staff member (PROBE: Who?)
- 3 Information from Xcel Energy in general (i.e. bill inserts, direct mailings)
- 4 From an equipment vendor or contractor (PROBE: Who?)
- 5 From a colleague or coworker at my company
- 6 Previous experience with an Xcel Energy program
- 7 Xcel Energy event
- 8 An online resource (i.e. a website, blog, e-mail, social media site or online ad)
- 9 A mass advertising campaign
- 10 Saw an article in a newspaper, magazine, or newsletter
- 11 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



PA1a (FOR PA1 = 1,2,3,4; EACH OPTION SELECTED IN PA1) How did **[RESPONSE FROM PA1]** inform you about Xcel Energy's **[PROGRAM]**? PROBE: Did you hear about the program any other way? (DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 A flyer in my Xcel Energy bill
- 2 Stand alone mailpiece/newsletter (e.g. Energy Solutions) from Xcel
- 3 Other information in the mail
- 4 Received a phone call
- 5 By making a phone call
- 6 Received an email or other electronic message
- 7 In a personal meeting
- 8 At a seminar or event
- 9 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA1D (IF PA1 = 8) Which online resource?
(DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 Xcel Energy's website
- 2 A vendor's website
- 3 An online ad
- 4 An Xcel Energy blog
- 5 A blog other than Xcel Energy's
- 6 Xcel Energy's Facebook fan page
- 7 Xcel Energy's Twitter page
- 8 Xcel Energy's Energy Solutions e-newsletter
- 9 A vendor's e-mail
- 10 An online radio ad
- 11 An online radio interview or podcast
- 12 Google search
- D DON'T KNOW
- R REFUSED



PA1E (IF PA1 = 9) What type of advertising campaign?
(DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 A radio ad
- 2 A television ad
- 3 A newspaper ad
- 4 Billboards
- 5 Print ads
- 6 Electronic or internet
- 7 Other
- D DON'T KNOW
- R REFUSED

PA2 Did you consider participating in any other Xcel Energy energy efficiency programs (IF PTYPE<>3: for these energy efficient improvements) before you decided to participate in the **[PROGRAM]**?

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

PA2A (IF PA2=1) Which program(s) did you consider participating in?
(RECORD RESPONSE)

PA2B (If PA2=1) Why did you decide to participate in **[PROGRAM]** instead of (PROGRAM MENTIONED IN PA2A)?
(RECORD RESPONSE)

PA2C Have you ever participated in any other Xcel Energy programs?

- 1 Yes (PROBE: Which ones?)
- 2 No
- D DON'T KNOW
- R REFUSED

Net-To-Gross and Spillover

(IF PTYPE <> 1, SKIP TO S5)

NINTRO For the next series of questions, I would like to focus on the **[EEMeas]** improvements you purchased or implemented through the program since



January 1, 2011. From this point forward, I will refer to these improvements as **energy efficient improvements**.

N1 Why did you decide to implement the **energy efficient improvements**? *[SELECT 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 The program-subsidized study
- 4 The program-subsidized action plan
- 5 Recommendation of third party contractor/engineer
- 6 Recommendation of Xcel Energy staff
- 7 Recommendation of internal staff
- 8 Assistance provided through Xcel Energy/program vendor staff (e.g., the implementation contractor)
- 9 Wanted to save energy
- 10 Wanted to reduce costs
- 11 Past experience with any Xcel Energy program *[SPECIFY]*
- 12 Funding from an outside source *[SPECIFY SOURCE & AMOUNT]*
- 13 Something else *[SPECIFY]*
- 14 DON'T KNOW
- 15 REFUSED

N2 Did you hear about the program BEFORE or AFTER you decided to purchase or implement the **energy efficient improvements** that were eventually purchased or implemented?

- 1 Before
- 2 After
- 3 At the same time *[DON'T MENTION]*
- D DON'T KNOW
- R REFUSED

N2a Did you receive a feasibility study, energy audit, facility assessment or technical assistance from Xcel Energy or its selected program vendor for the **energy efficient improvements**?

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



N3INT The **[PROGRAM]** offered **[ASSISTANCE]** to cover a portion of the additional cost to purchase or implement the **energy efficient improvements** over standard efficiency equipment.

With that in mind, I'm going to ask you to rate the importance of factors that might have influenced your decision to purchase or implement the **energy efficient improvements**. 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 or implement the **energy efficient improvements** over standard efficiency equipment at this time.

____ (0-10)
 88 DON'T KNOW
 99 REFUSED

[LIST ROTATES]

- N3A** The age or condition of the old equipment
- N3B** Availability of the program rebate or financial incentive
- N3C** Information provided through an Xcel Energy study, audit, metering, or other technical assistance
- N3D** Recommendation from a vendor/supplier not affiliated with the program [IF > 5, COLLECT NAME AND CONTACT INFORMATION OF VENDOR AND INTERVIEW VENDOR AT END OF SURVEY]
- N3E** Previous experience with any Xcel Energy program
- N3F** Information from an Xcel Energy training course or seminar
- N3G** Information from the program or utility marketing materials
- N3H** Standard practice or corporate policy in your business prior to participating in the program regarding equipment installation
- N3I** Payback on investment before any Xcel Energy rebates
- N3J** General concerns about the environment/global warming/energy independence
- N3K** Financial assistance or rebate from another organization, not Xcel Energy
- N3L** Information or recommendations provided to you by any Xcel Energy staff
- N3M** Other project assistance provided through Xcel Energy such as action plan development, return on investment calculations or assistance completing the program application

N3NASK Is there anything else that influenced your decision to purchase or implement the **[EE_MEAS]** that I haven't mentioned

- 1 Yes **[SPECIFY]**
- 2 No

N3N The other factors you mentioned



N4INT Now I'd like to ask you about the importance of the **[PROGRAM]** to your decision.

Again using the 0 to 10 rating scale, where 0 means "Not at all important" and 10 means "Very important", I'd like you to rate the overall importance of the program and the overall importance of **[highest rated of N3a, N3h, N3i, N3j, or N3k in the case of a tie, show "factors outside of the program"]** in your decision to purchase or implement the **energy efficient improvements** over standard efficiency equipment so that both scores add up to ten].

If the Xcel Energy Program was more important, it should receive a higher score. If the factors outside of the program were more important, it should receive a higher score, if the program and factors outside of the program were of equal importance, the scores should be the same. The two scores must add up to 10.

N4_PSC ____ rating of the importance of the **[PROGRAM]**

N4_OSC ____ 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.

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 purchased or implemented the **energy efficient improvements** over standard efficiency equipment if the **[PROGRAM]** had not been available?

____ (0-10)
88 DON'T KNOW
99 REFUSED

N6 *[ASK IF N5>0]* You said that there was a **[N5 response]** in 10 likelihood that you would have purchased or implemented the **energy efficient improvements** over standard efficiency equipment if the **[PROGRAM]** had not been available. When do you think you would have purchased or implemented the **energy efficient improvements**?

[INTERVIEWER: PLEASE ANSWER IN MONTHS]

____ Number of months later
555 Never
888 DON'T KNOW
999 REFUSED

PARTIAL FREE-RIDERSHIP BATTERY



P1A_IN Now I would like you to think one last time about what action you would have taken if the program had not been available.

P1A Supposing that you had not participated in the **[PROGRAM]** or received information and expertise about purchasing or implementing the **energy efficient improvements** from Xcel Energy, which of the following alternatives would you have been MOST likely to do?

[READ LIST, OPTIONS 1-6 ARE RANDOMIZED]

- 1 Install or implement fewer **energy efficient improvements**
- 2 Install standard efficiency equipment or whatever required by code
- 3 Install equipment more efficient than code, but less efficient than what 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

P2A [IF P1A=1] (INTERVIEWER DO NOT READ) RECORD WHICH **[EEMeas descriptions]** WOULD HAVE INSTALLED FEWER.

[RECORD SPECIFIC MEASURE(S)]

P2 [IF P1A=1] What percentage of measures would you have installed or implemented if the program had not been available? (RECORD PERCENTAGE OF UNITS RESPONDENT WOULD HAVE INSTALLED)

____ Percentage of units would have installed
 888 DON'T KNOW
 999 REFUSED

P3 [IF P1A=3] 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 "I would not have installed a VFD".)

[RECORD VERBATIM]



P4A To confirm, did this equipment replace existing equipment?

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

P4B [IF P4A = YES] How long do you think the existing equipment would have lasted before requiring replacement?

- _____ Months
- 888 DON'T KNOW
- 999 REFUSED

Additional Questions

T1 How influential was your company's participation in the Process Efficiency program, including all of the information and technical assistance you received, in planning the design and installation of the **energy efficiency improvements** we have been discussing? Would you say your participation in the program had:

- 1 *no influence* on your plans
- 2 *a little influence* on your plans
- 3 *a moderate influence* on your plans
- 4 *a significant influence* on your plans

T2 I'd like to better understand your purchase decision. In your own words, please describe what impact, if any, all the assistance you received through the program had on your decision to install the amount of **energy efficient improvements** at the time you did?

[RECORD VERBATIM]

Like Spillover



S1 Since you first started participating in the **[PROGRAM]**, have you installed or implemented any of the exact same energy efficient **[EEMeas descriptions]** on your own **without** the financial assistance of a Xcel Energy program at this facility or at other locations served by Xcel Energy?

- 1 Yes, only at this facility *[RECORD WHICH MEASURES]*
- 2 Yes, only at another facility *[RECORD WHICH MEASURES]*
- 3 Yes, at both this and another facility *[RECORD WHICH MEASURES]*
- 4 No *[SKIP TO S5]*
- D DON'T KNOW *[SKIP TO S5]*
- R REFUSED *[SKIP TO S5]*

S2 How do you know that this equipment is high efficiency or otherwise saves energy? *[PROBE: IS IT ENERGY STAR® RATED; BOILERPLATE EFFICIENCY RATING, DID THE VENDOR TELL YOU?]*

[RECORD VERBATIM]

S2a Thinking of the **energy efficient improvements** that you installed on your own, how does the quantity compare to what you installed through the program overall? Did you install more, less or the same amount of **energy efficient improvements**?

(PROBE: We're looking for a percent compared to the amount installed through the program. For example, was it about one- fourth of what you installed through the program, one-half of what you installed through the program, the same (100%) amount as you installed through the program, twice as much as what you installed through the program (200%) or some other amount?)

- 1 More [Enter percentage: 101-900%] ____ **S2aM**
- 2 Less [Enter percentage: 1-99%] ____ **S2aL**
- 3 Same amount *[SKIP TO S3]*
- D DON'T KNOW *[SKIP TO S3]*

S2b *[IF S2a=1 or 2]* So the amount of additional energy efficient equipment you bought on your own was **[percentage from S2a]** of what you got through the program overall?

- 1 Yes
- 2 No *[correct S2a]*



- S3** I'm going to read a statement about the energy efficiency measure(s) that you purchased or 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 **Xcel Energy's programs** and/or the Process Efficiency Program influenced my decision to install or implement this/these improvement(s) on my own.

____ (0-10)
88 DON'T KNOW
99 REFUSED

- S4** Why did you purchase/implement this energy efficiency measure without going through an Xcel Energy program? *[DO NOT READ; INDICATE ALL THAT APPLY]*

- 1 Application process too burdensome/Too much paperwork
- 2 Takes too long to receive the rebate
- 3 No time to participate, needed equipment immediately
- 4 The program had ended
- 5 The equipment would not qualify *[PROBE: WHY NOT?]*
- 6 The rebate amount wasn't large enough
- 7 Did not know program was available for this equipment
- 8 There was no program available
- 9 Outside of Xcel Energy territory
- 10 Other *[SPECIFY]*
- 11 DON'T KNOW
- 12 REFUSED

S4ask *[IF S4=6]* How much of a rebate would you need to persuade you to purchase or implement the **energy efficient improvements** through the **[PROGRAM]**?

[RECORD VERBATIM]

Unlike Spillover

- S5** Since you first started participating in the **[PROGRAM]**, have you implemented any energy efficient improvements (IF PTYPE = 1: other than the ones we have already discussed) at this location or another location **without** the financial assistance of Xcel Energy?

- 1 Yes
- 2 No *[SKIP TO S10]*
- 3 DON'T KNOW *[SKIP TO S10]*
- R REFUSED *[SKIP TO S10]*



S6 What improvements have you made? *[DO NOT READ; SELECT ALL THAT APPLY]*

- 1 Installed high efficiency lighting equipment
- 2 Added lighting controls, occupancy sensors, and or time clocks
- 3 Installed high efficiency cooling equipment
- 4 Installed high efficiency heating equipment
- 5 Installed high efficiency ventilation equipment
- 6 Added controls to the heating, ventilation or AC systems to reduce use
- 7 Made changes to the heating, ventilation or AC system maintenance schedule

- 8 Made changes to the building envelope such as insulation, window film, etc.
- 9 Participated in other Xcel Energy energy efficiency programs [SPECIFY]
- 10 Facility-wide energy awareness training
- 11 Recommissioning or retrocommissioning
- 12 Process improvements
- 13 Installed high efficiency motors or drives
- 14 Installed high efficiency refrigeration equipment
- 15 Tuned up existing equipment
- 16 Participated in other Xcel energy on-site assessment or completed a study
- 17 Other [SPECIFY]
- D DON'T KNOW
- R REFUSED

S6a Were any of these energy efficient improvements implemented at any locations outside of Xcel Energy's service territory?

- 1 Yes (PROBE: Which were implemented outside Xcel Energy's service territory?)
- 2 No
- D Don't know

S7 *[ASK FOR EACH MENTIONED IN S6 IMPLEMENTED WITHIN XCEL ENERGY TERRITORY (S6A <> 1)]* Could you describe the **[S6 RESPONSE]** that you implemented, including the quantity of equipment?

[RECORD VERBATIM, MAKING SURE TO CAPTURE QUANTITY]



- S8** I'm going to read a statement about the energy efficiency measures that you purchased or 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 Xcel Energy's programs and/or the Process Efficiency Program influenced my decision to install or implement these improvements on my own.

____ RECORD 0-10
 88 DON'T KNOW
 99 REFUSED

- S9** Why did you purchase or implement this(these) energy efficiency measure(s) without going through an Xcel Energy program? *[DO NOT READ; SELECT ALL THAT APPLY]*

1 Application process too burdensome/Too much paperwork
 2 Takes too long to receive the rebate
 3 No time to participate, needed equipment immediately
 4 The program had ended
 5 The equipment would not qualify *[PROBE: Why not?]*
 6 The rebate amount wasn't large enough
 7 Did not know program was available for this equipment
 8 There was no program available
 9 Outside of Xcel Energy territory
 10 Other *[SPECIFY]*
 11 DON'T KNOW
 12 REFUSED

- S9_ASK** *[IF S9=6]* How much of a rebate would you need in order to decide to implement this project through the **[PROGRAM]**?

[RECORD VERBATIM]



S10 (IF HAVEN'T DONE ANYTHING, S5 <> 1) What are the reasons you haven't been able to make any additional energy saving improvements at this facility? (DO NOT READ; SELECT 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 Capital budget issues
- 13 Improvements under way but not yet complete
- 14 Long cycle for project approval still underway
- 15 Other (SPECIFY)
- 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]**.

SA1B Who all was involved in.....

[IF NEEDED, PROBE: Anyone else? Was anyone from Xcel Energy, or a contractor, involved?]

- A** Conducting the initial business practice benchmarking session
- B** (IF STUDY = 1) The subsidized technical assessment to identify energy-saving opportunities
- C** (IF PTYPE <> 3) The implementation of energy efficient improvements at your facility(s)
- D** (IF PTYPE <> 3) Completing the rebate application for energy efficient improvements

(INDICATE ALL THAT APPLY)

- 1 Xcel Energy account manager
- 2 Xcel Energy sales engineer
- 3 Other Xcel Energy program staff
- 4 The program implementation contractor
- 5 Study provider
- 6 The equipment vendor
- 7 Respondent
- 8 Someone else at your company
- 9 Other (SPECIFY)
- N Not yet complete
- D DON'T KNOW
- R REFUSED

SA1C (IF PTYPE <> 3) How did you choose the contractor who installed the energy efficient improvements at your facility(s)?

- 1 Chose contractor with whom had an existing relationship
- 2 Chose contractor from list provided by Xcel Energy
- 3 Chose contractor based on Xcel Energy funded study
- 4 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

SA1C_1 (IF PTYPE <> 3) Why did you choose that contractor?

(RECORD RESPONSE)



SA1C_2 (IF PTYPE <> 3) When it comes to choosing a contractor to install energy efficiency improvements, like the ones you implemented through **[PROGRAM]**, would you prefer to choose from a list of experienced contractors provided by Xcel Energy, OR would you prefer to choose from any available contractors in the market?

- 1 Xcel Energy experienced contractors
- 2 Choose own contractors from any in market
- 3 No preference
- D DON'T KNOW
- R REFUSED

SA1D (IF SA1B_D = 7) Did you require any assistance from Xcel Energy staff or a vendor to complete the rebate application?

- 1 Yes (PROBE: Who did you receive assistance from?)
- 2 No
- D DON'T KNOW
- R REFUSED

SA1E (IF SA1D = 1) With what did you require assistance? (DO NOT READ)

(RECORD OPEN ENDED RESPONSE)

SA2A (IF STUDY = 1) Who told you the amount of the financial assistance you would receive for conducting a technical assessment to identify energy-saving opportunities? (INDICATE ALL THAT APPLY)

- 1 Xcel Energy account manager
- 2 Xcel Energy sales engineer
- 3 Other Xcel Energy program staff
- 4 Study vendor
- 5 No one – I figured it out myself
- 6 Other (specify)
- D DON'T KNOW
- R REFUSED



SA3A (IF STUDY = 1) Was the amount of financial assistance you received for the technical assessment to identify energy-saving opportunities 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

SA2b (IF PTTYPE<>3 AND RECEIVED A REBATE) Who told you the amount of the rebate you would receive for implementing energy efficient improvements through the program? (INDICATE ALL THAT APPLY)

- 1 It was listed on the rebate application
- 2 Xcel Energy account manager
- 3 Xcel Energy sales engineer
- 4 Other Xcel Energy program staff
- 5 Contractor or vendor
- 6 No one – I figured it out myself
- 7 Other (specify)
- D DON'T KNOW
- R REFUSED

SA3B (IF PTTYPE<>3 AND RECEIVED A REBATE) In general, was the rebate amount you received less, more, or the same as was initially estimated for implementing the energy efficient improvements?

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

SA3B1 [IF PTTYPE<>3] In general, was the savings estimate you received during the final rebate approval process less, more, or the same as what was initially estimated during the preliminary energy analysis?

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



SA3B2 (IF RECEIVED A REBATE) Was the rebate included as part of your capital spending proposal to get the project approved?

- 1 Yes (PROBE: On a 0 to 10 scale where 0 is “not at all important” and 10 is “very important”, how would you rate the importance of the rebate in getting the project capital approved?)
- 2 No (PROBE: Why not?)
- D Don’t know
- R Refused

SA4 (IF BONUS = 1) On a zero to ten scale, with zero being not at all important and ten being very important, how would you rate the importance of the bonus in your decision to install the energy efficient improvements?

___ (0-10) rating of importance of bonus

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

- a. ___ (0-10) The type of equipment or improvements eligible for the program (If <5, probe: Why is that?)
- b. ___ (0-10) Requirements for energy efficient project rebate eligibility (If <5, probe: Why is that?)
- c. ___ (0-10) (IF PTYPE <> 3) The amount of the rebate (If <5, probe: Why is that?)
- d. ___ (0-10) (IF PTYPE <> 3) The rebate application process in general
- e. ___ (0-10, N/A) The program’s handling of your questions or complaints (If <5, probe: Why is that?)
- f. ___ (0-10) (IF PTYPE <> 3) The amount of time it took to receive the rebate (If <5, probe: Why is that? When did you apply for this rebate?)
- g. ___ (0-10) (IF PTYPE <> 3) The contractor who installed the equipment or implemented the measures (If <5, probe: Why is that?)
- h. ___ (0-10) The program information you received from Xcel Energy (If <5, probe: Why is that?)
- i. ___ (0-10) (IF PTYPE <> 3) The amount of energy savings you’ve seen since the project completed (If <5, probe: Why is that?)
- j. ___ (0-10, N/A) The information and discussion provided by the free one-day business practices benchmarking session (If <5, probe: Why is that?)
- k. ___ (0-10) (IF STUDY = 1) The funding amount the program provided for the Phase 2 technical assessment (If <5, probe: Why is that?)
- l. ___ (0-10) (IF STUDY = 1) The Phase 2 technical assessment and analysis done to identify and scope potential energy saving measures or processes (If <5, probe: Why is that?)



- m. ____ (0-10) (IF STUDY=1) Technical assistance provided by Xcel Energy or their vendor to assist you with energy efficiency projects
- n ____ 0-10) (IF ENVINTA = 1) Benchmark energy usage information that compared your facility to other similar facilities (If <5, probe: Why is that?)
- o ____ 0-10) The quality/actionability of the study(ies) performed in identifying energy improvements (If <5, probe: Why is that?)
- p ____ 0-10) The level of communication and/or engagement of Xcel Energy staff and their subcontractors (If <5, probe: Why is that?)
- q. ____ (0-10) (IF BONUS = 1) The amount of the bonus you received (If <5, probe: Why is that?)

SA6X (IF SA6D<7) You mentioned earlier that you weren't completely 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 Time lapse between completing the application and getting approval from Xcel Energy
- 7 Other (Specify)
- D DON'T KNOW
- R REFUSED

SA7A Moving on, of all the assistance you received through the **[PROGRAM]**, what program assistance did you find most helpful? (DO NOT READ, RECORD ALL THAT APPLY)

- 1 Business practice benchmarking
- 2 Technical assessment to identify energy saving opportunities
- 3 Funding to conduct technical assessment
- 4 Sub-metering
- 5 Assist in presenting projects to upper mgmt/make case for capital spending
- 6 Assistance with all applications
- 7 Energy flow mapping
- 8 Creating long-term implementation plan(s)
- 9 Bonuses
- 10 Prioritized list of opportunities
- 11 Holistic view of energy opportunities (looking up and down stream of system)
- 12 Having all functional groups involved in the Phase 1 meeting
- 13 Recognition
- 14 Less worry about preapproval dates for custom rebates
- 15 Other (Specify)
- D DON'T KNOW
- R REFUSED



SA7b (IF PTYPE <> 3) What barriers did you face, either inside or outside of your company, when deciding whether or not to purchase or implement energy efficient improvements [IF STUDY = 1: "identified in the technical assessment"] 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 staff time to oversee or perform projects
- 7 Incremental cost for more efficient equipment higher than we expected
- 8 Rebate amount not high enough (PROBE: How much rebate would you need in order to decide to [ACTION] through the [PROGRAM]?)
- 9 Payback too long (PROBE: What are your payback requirements for project to be approved?)
- 10 Other project approval metrics not met (PROBE FOR WHAT THEY ARE: ROI, funding limits, project complexity, etc.)
- 11 Business hesitant to replace existing working equipment
- 12 Upper management doesn't see the benefit of energy efficient equipment
- 13 Unsure of energy savings potential
- 14 We lease the space
- 15 Contractors weren't familiar with program
- 16 Internal staff lacked expertise about measures
- 17 Rebate application process was challenging
- 18 Communications with Xcel Energy staff/account manager (PROBE: who?)
- 19 Other (*SPECIFY*)
- 20 DON'T KNOW/REFUSED

SA7B_1 (IF SA7B <> 1) How did the **[PROGRAM]** help you overcome these barriers?

(RECORD RESPONSE)

SA7C What, if any, are the benefits your company has realized as a result of your participation in the **[PROGRAM]**?

- 1 Increased profits
- 2 Environmental protection
- 3 Staff engagement in energy efficiency/use
- 4 Positive public relations
- 5 Better equipment performance
- 6 Long-term strategic energy management plan
- 7 Better understanding of energy efficiency
- 8 Better understanding of internal processes
- 9 Reduced energy costs
- 10 Change in company culture amongst staff regarding energy efficiency
- 11 Staff retention or growth



- 12 Increased product quality
- 13 Lower environmental impacts
- 14 More control over energy bills
- 15 No benefits
- 16 Other
- D DON'T KNOW
- R Refused

SA7D Prior to participating in the **[PROGRAM]**, did your business have an energy conservation or sustainability policy in place, with trackable goals for reducing energy use?

- 1 Yes (PROBE: What was your policy?)
- 2 No
- D DON'T KNOW
- R REFUSED

SA7DA (IF SA7D = 1) Prior to participating in the **[PROGRAM]**, did your business have defined strategies for achieving these goals?

- 1 Yes (Probe: What were those strategies? RECORD VERBATIM)
- 2 No
- D DON'T KNOW
- R REFUSED

SA7E (IF SA7D = 1) Have your company's sustainability policy or energy savings goals and achievement changed since participating in the **[PROGRAM]**?

- 1 Yes (PROBE: How has it changed?)
- 2 No
- D DON'T KNOW
- R REFUSED

SA7F (IF SA7D <> 1) Does your business currently have an energy conservation or sustainability policy in place, with measurable goals for reducing energy use?

- 1 Yes (PROBE: What is your policy? (INTERVIEWER NOTE: MIGHT BE % OF ENERGY USE, DOLLARS SAVED ON ENERGY, % EMISSIONS REDUCED)
- 2 No (SKIP TO SA7K)
- D DON'T KNOW (SKIP TO SA7K)
- R REFUSED (SKIP TO SA7K)

SA7G Prior to participating in the **[PROGRAM]**, did your business track your progress towards your energy-saving goals?



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

SA7H (IF SA7G = 1) Have your tracking practices changed since participating in the [PROGRAM]?

- 1 Yes (PROBE: How have they changed?)
- 2 No
- D DON'T KNOW
- R REFUSED

SA7I (IF SA7G <> 1) Does your business currently track your progress towards your energy-saving goals?

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

SAT7IA (IF SA7G= 1 OR SA7I = 1) What metrics do you currently use to track progress towards these goals?

(PROBE: Who, if anyone, is accountable for ensuring these metrics are met?)

(RECORD VERBATIM)

SA7J How sustainable do you feel energy efficiency will be within your organization?

(RECORD VERBATIM)

SA7K (IF ENVINTA = 1) Have you implemented any recommendations from the the business practice benchmarking done as part of your Phase 1 EnVINTA kick-off session? [IF PTYPE<>3: other than those we have previously discussed]?

- 1 Yes
- 2 No (PROBE: Why not?)
- D DON'T KNOW
- R REFUSED

SA7K_1 (IF SA7K = 1) What have you implemented, other than the energy efficiency



improvements we previously discussed?

(RECORD RESPONSE)

SA9 (IF PHASE <> 3) Are you currently pursuing or planning on moving on to the next phase of the program:

[IF PHASE = 1 SHOW "Phase 2 – Technical Assessment/Scoping"]

[IF PHASE = 2 SHOW "Phase 3 – Implementation"]?

- 1 Yes, currently pursuing
- 2 Yes, planning on pursuing
- 3 No
- D DON'T KNOW
- R REFUSED

SA9A (IF SA9 = 2) Can you describe your plan in more detail?

(IF NEEDED, PROBE: When do you plan to move forward? What steps do you plan to take?)

(RECORD RESPONSE)

SA10 (IF SA9 = 3) Why are you not planning on moving on to the next stage of the program? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 Other priorities for capital spending
- 2 Lack of funds available for investment
- 3 Lack of financing
- 4 Economy
- 5 Amount of management time to oversee projects
- 6 Incremental cost for more efficient equipment higher than we expected
- 7 Not enough opportunities identified by EnVINTA session or scoping study
- 8 Rebate amounts not high enough (PROBE: How much rebate would you need to move forward?)
- 9 Hesitant to replace existing working equipment/ change existing processes
- 10 Upper mgmt doesn't see the benefit of energy efficient equipment (PROBE: What can Xcel Energy do to help you overcome this barrier?)
- 11 Unsure of energy savings potential
- 12 Internal staff lacked expertise about measures
- 13 Rebate application process was challenging
- 14 Change in business conditions
- 15 Payback too long (PROBE: What are your payback requirements for project to be approved?)
- 16 Other project approval metrics not met (PROBE FOR WHAT THEY ARE: ROI,



- funding limits, project complexity, etc.)
17 Other (*SPECIFY*)
D DON'T KNOW
R REFUSED

SA11 In addition to what we have already discussed, have any of your other business practices or manufacturing processes changed as a result of your participation in the **[PROGRAM]**?

- 1 Yes (PROBE: What has changed and how has it changed?)
2 No
3 DON'T KNOW
4 REFUSED

SA12 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

SA13 Why do you say that?

(RECORD VERBATIM)

SA13A (IF PA2C = 1) In general, how would you describe the value of the Process Efficiency program compared to your experience with other Xcel Energy programs?

(RECORD VERBATIM)



SA14 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 Simplify the program application process or form (SPECIFY)
- 6 Require less information
- 7 Have completely web-based/online process
- 8 Give more detailed instructions or examples on application/form
- 9 Ensure that quoted rebate is the same as actual rebate
- 10 Add additional post-implementation benchmarking or assessments
- 11 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

SA15 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? (REPEAT SCALE IF NECESSARY)

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

SA16 Considering the price you pay relative to the quality of the products and services you receive, how would you rate Xcel Energy's overall value, this time using a 0-to-10 scale where "0" means very poor value and "10" means very good value?

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

Customer Profile



N3_DVEN (ASK IF N3_D > 5)

Earlier you indicated that the recommendation from a vendor or supplier influenced your decision to participate in the **[PROGRAM]**.

Could you give me the contact information of the vendor you worked through?

- 1 Yes (Collect Contact Information)
- 2 No

F6 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

F7 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 (Collect Contact Information)
- 2 No
- D DON'T KNOW

F8 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 us to share with Xcel Energy?

(RECORD VERBATIM)



APPENDIX D: NONPARTICIPANT SURVEY INSTRUMENT AND RESPONSE RATE

Table D-1. Nonparticipant Cooperation Rate

Sample Disposition	Colorado Process Efficiency
Sample Size	45
Bad number	15
Ineligible - Respondent no longer at company	0
Ineligible - Doesn't recall participation	0
Adjusted Sample Size	30
Hard Refusal	3
Soft Refusal ¹	0
Incompletes (partial interviews)	0
Unavailable for duration	0
Language barrier/non-English	0
Active ²	15
Active, but on hold (8 attempts)	6
Completed Surveys	6
Cooperation Rate³	20.0%

¹ Attempts were made to convert all soft refusals.

² An average of 5.2 contacts per active case have been made to attempt to complete the interview.

³ Number of completed surveys divided by Adjusted Sample Size.

The complete list of survey modules follows:

- Introduction
- Identification of Decision-Maker
- Source of Program Information/Social Media
- Important Factors in Decision-Making Processes
- Satisfaction
- 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 nonparticipant database.



[Program] Program name

- 1 Process Efficiency Program (CO)
- 2 Process Efficiency Program (MN)
- 3 Cooling Efficiency Program (MN)

[Program description] Program description

(Process Efficiency) provides technical support and financial assistance to help industrial customers integrate energy efficiency into their manufacturing processes

(Cooling Efficiency) provides rebates to encourage business customers to choose high efficiency air conditioning equipment that bests fits their needs.

[Study] Indicator of whether cooling study was implemented

[Action] Action taken on own

(Process Efficiency) conduct energy benchmarking of business practices, technical studies to identify energy-saving opportunities, and implementation of energy efficiency improvements

(Cooling Efficiency) install high efficiency air conditioning equipment

[Address] facility address

[Contact name] contact listed in participant files

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

[Eligible] currently eligible for Process Efficiency program

- 1 Customer eligible
- 2 Customer NOT currently eligible in CO
- 3 Customer NOT currently eligible in MN

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 (IF COOLING: air conditioning) 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 and interest in energy efficiency programs and services.)

(Timing: This survey should take about 15 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 (IF COOLING: air conditioning) equipment at this location (IF COOLING: at **[ADDRESS]** ?

- 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 (IF COOLING: air conditioning) 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 (IF COOLING: air conditioning) equipment at this location?

- 1 No one else
- 1 (SPECIFY)



Screenener

SCR1 (IF PROGRAM = 3) Does your organization have: air conditioning equipment (such as rooftop AC units, chillers, packaged terminal ACs, economizers, water source heat pumps, or plate and frame heat exchangers) at this location) this location or any of your locations)?

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

SCR2 (IF PROGRAM = 3) Do you have an Xcel Energy account representative assigned to your company?

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

SCR3 (IF PROGRAM = 3) Is your company currently participating in Xcel Energy's Cooling Efficiency Program, or have you participated in the past 5 years?

- 1 Yes (THANK AND TERMINATE)
- 2 No
- D Don't Know
- R Refused

SCR4 (IF PROGRAM = 1 OR 2) Is your company currently participating, or has your company recently participated in an Xcel Energy energy efficiency program?

- 1 Yes (PROBE: Which program?)
- 2 No
- D Don't Know
- R Refused



SCR4a (IF SCR4 = 1 AND ELIGIBLE = 1) Were you aware of the Process Efficiency program when you decided to participate in [PROGRAM FROM SCR4]?

- 1 Yes
- 2 No
- D Don't Know
- R Refused

SCR4b (IF SCR4a = 1) Why did you decide to participate in the [PROGRAM FROM SCR4] instead of the Process Efficiency Program?

(RECORD VERBATIM)

(IF PROGRAM = 1 OR 2 AND SCR4a = 1 SKIP TO PA6a)

SCR5 (IF PROGRAM = 3 AND STUDY = 1) Our records indicate that your firm conducted a cooling study at your facility(s), which included the identification of energy efficiency opportunities, and development of a plan to implement the energy efficiency improvements. Is this correct?

- 1 Yes
- 2 No
- D Don't Know
- R Refused

Cooling Study Questions

(IF PROGRAM <> 3 OR SCR5 <> 1 SKIP TO PA0a)

ST1 Are you familiar with the study that was conducted?

- 1 Yes
- 2 No [SKIP TO PA0a]
- D Don't Know [SKIP TO PA0a]
- R Refused [SKIP TO PA0a]



ST2 Why did your firm decide to have a study conducted?

(RECORD VERBATIM)

ST3 Did your firm receive funding from Xcel Energy that covered part of the study cost?

- 1 Yes
- 2 No [SKIP TO ST5]
- D Don't Know [SKIP TO ST5]
- R Refused [SKIP TO ST5]

ST4 How influential was the Xcel Energy funding in your firm's decision to have a study conducted? Would you say it is... [READ LIST; SELECT ONE]

- 1 Very influential
- 2 Somewhat influential
- 3 Not very influential
- 4 Not at all influential
- D Don't Know
- R Refused

ST5 Using a 0-10 scale with 0 being very dissatisfied and 10 being very satisfied, how satisfied were you with...

- 1 the information provided from the study?
- 2 [IF ST3=1] the amount of the Xcel Energy rebate provided for the study?

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

ST6 Did your firm act on any of the energy saving opportunities identified in the study?

- 1 Yes [PROBE: What your firm has done?]
- 2 No [PROBE: Why not?]
- D Don't Know
- R Refused

(IF CONDUCTED STUDY (SCR5 = 1), SKIP TO PA0b)

Source of Program Awareness



PA0a Xcel Energy offers rebate and technical assistance programs to assist customers in making energy saving improvements in their facilities. Before today, were you aware Xcel Energy offers these types of programs? (RECORD ONE NUMBER)

- 1 Yes
- 2 No (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

(IF ELIGIBLE <> 1, SKIP TO PA4a)

PA0b One specific program Xcel Energy offers is called the **[program]**, which **[program description]**. Before today, had you heard of this program? (RECORD ONE NUMBER)

- 1 Yes
- 2 No (SKIP TO PA4)
- D DON'T KNOW (SKIP TO PA4)
- R REFUSED (SKIP TO PA4)

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 Through my account manager
- 2 Through a representative at the Business Solutions Center
- 3 Another Xcel Energy staff member (PROBE: Who?)
- 4 Information from Xcel Energy in general (i.e. bill inserts, direct mailings)
- 5 From an equipment vendor or contractor (PROBE: Who?)
- 6 From a colleague or coworker at my company
- 7 Previous experience with an Xcel Energy program
- 8 Xcel Energy event
- 9 An online resource (i.e. a website, blog or online ad)
- 10 A mass advertising campaign
- 11 Saw an article in a newspaper, magazine, or newsletter
- 12 Results of an energy study
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



PA1a (FOR PA1 = 1,2,3,4,5; EACH OPTION SELECTED IN PA1) How did **[RESPONSE FROM PA1]** inform you about Xcel Energy's **[program]**? PROBE: Did you hear about the program any other way? (DO NOT READ LIST, RECORD ALL THAT APPLY)

- 1 A flyer in my Xcel Energy bill (PROBE: Was this in your home, or your business energy bill?)
- 2 A stand alone direct mail piece or newsletter (e.g. Energy Solutions) from Xcel Energy
- 3 Other information in the mail
- 4 **[RESPONSE FROM PA1]** called me
- 5 I/We called **[RESPONSE FROM PA1]**
- 6 In person meeting with **[RESPONSE FROM PA1]**
- 7 Received an email
- 8 In a personal meeting
- 9 At a seminar or event
- 10 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA1d (IF PA1 = 9) Which online resource?

- 1 Xcel Energy's website
- 2 A vendor's website
- 3 An online ad
- 4 An Xcel Energy blog
- 5 A blog other than Xcel Energy's
- 6 Xcel Energy's Facebook fan page
- 7 Xcel Energy's Twitter page
- 8 Xcel Energy's Energy Solutions e-newsletter
- 9 A vendor's e-mail
- 10 An online radio ad
- 11 An online radio interview or podcast
- 12 Google search
- 13 Other [SPECIFY]
- D DON'T KNOW
- R REFUSED



PA1e (IF PA1 = 10) What type of advertising campaign?

- 1 A radio ad
- 2 A television ad
- 3 A newspaper ad
- 4 Billboards
- 5 Print ads
- 6 Electronic or internet
- 7 Other [SPECIFY]
- D DON'T KNOW
- R REFUSED

PA1f (IF PROGRAM <> 3 AND PA1 <> 1) Has your Xcel Energy account representative informed you about the **[PROGRAM]**?

- 1 Yes (PROBE: What has your account rep told you about the program?)
- 2 No
- D DON'T KNOW
- R REFUSED

PA2 You said that you received information from **[insert sources of information from PA1 and, if PA1f = 1 “and your account representative”]**. Did this provide you with enough information to know how to participate in the program if you wanted to?

- 1 Yes
- 2 No (PROBE: What additional information would you have liked to receive?) (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA4 (IF ELIGIBLE =1) The **[PROGRAM]** offers **[ACTION]**. Have you implemented, or considered implementing any of these in the past two years?

- 1 Yes, implemented
- 2 Yes, considered
- 3 No, previously implemented more than 2 years ago
- 4 No (SKIP TO PA8)
- D DON'T KNOW (SKIP TO PA8)
- R REFUSED (SKIP TO PA8)

PA4a (IF PROGRAM <> 3 AND ELIGIBLE <> 1) Have you implemented or considered implementing **[ACTION]** in the past two years?

- 1 Yes, implemented



- 2 Yes, considered
- 3 No, previously implemented more than 2 years ago
- 4 No (SKIP TO I0a)
- D DON'T KNOW (SKIP TO I0a)
- R REFUSED (SKIP TO I0a)

PA5_P (IF PROGRAM <> 3) What have you [IF PA4 = 1 or PA4 = 3: done, IF PA4 =2: considered doing]? (RECORD ALL THAT APPLY)

- 1 Benchmarking of energy use in manufacturing processes
- 2 Technical study, assessment, or audit to identify energy-saving opportunities
- 3 Installing energy efficient equipment or implemented energy-saving practices (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA5_C (IF PROGRAM = 3) What have you [IF PA4 = 1: done, IF PA4 =2: considered doing]? (RECORD ALL THAT APPLY)

- 1 Hotel Room Controller
- 2 Packaged terminal air conditioners (PTAC)
- 3 Rooftop Economizer
- 4 Water Source Heat Pump
- 5 Direct Exchange (DX) units
- 6 Plate and Frame Heat Exchangers
- 7 Variable Speed Drive (VSD) on Chiller
- 8 Chillers
- 9 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA5_C1 (IF PROGRAM = 3, PA4a = 1 or PA4 =3, AND RECEIVED STUDY (SCR5 = 1)) How influential was the cooling study in your decision to install (equipment from PA5_C)? Would you say..... [READ LIST; SELECT ONE]

- 1 Very influential
- 2 Somewhat influential
- 3 Not very influential
- 4 Not at all influential
- D Don't Know
- R Refused

(IF ELIGIBLE <>1, SKIP TO I0a)



PA6 (ASK IF PA0b = YES) Did you consider participating in the **[Program]** when you [IF PA4 = 1 or PA4 = 3: did this?][IF PA4 = 2, considered doing this]?

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

PA6a (ASK IF PA6=1 OR SCR4a = 1) Did you apply to participate in the **[Program]**?

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

(IF SCR4a = 1 SKIP TO PA8)

PA7 (IF PA6a<>1) Why didn't you apply to participate in this program? (IF PA6a=1) Why didn't you complete **[answer from PA5]** through the program? (DO NOT READ) (RECORD ALL THAT APPLY)

- 1 Application process too burdensome/Too much paperwork
- 2 Takes too long to get approval
- 3 No time to participate, needed equipment immediately
- 4 The program had ended
- 5 The equipment would not qualify (PROBE: Why not?)
- 6 Rebate/funding amount wasn't important enough
- 7 Did not know program was available for this equipment (PROBE: Did your rep walk you through the process and offer assistance on the paperwork?)
- 8 There was no program available (PROBE: Which program?)
- 9 Concerns from existing vendor about participating in program
- 10 Decided to apply for a different Xcel Energy energy efficiency program
- 11 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA7a (ASK IF PROGRAM <> 3 AND PA7=10) Why did you decide to apply for this program instead of the **[Program]**?

(RECORD VERBATIM)

PA7b (ASK IF PA6a=1 AND PA7 <> 10) What additional support would you need to implement **[PA5_P or PA5_C]** 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 PA8 <7) Are there any reasons you wouldn't consider participating in this program in the future? (DO NOT READ) (RECORD ALL THAT APPLY)

- 1 Application process seems too burdensome/Too much paperwork
- 2 Would take too long to get internal approval
- 3 No time to participate, would need equipment immediately
- 4 Rebate amount isn't important enough
- 5 Program is still unclear/difficult to understand
- 6 Concerns from existing vendor about participating in the program
- 7 None
- 8 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

PA9A (ASK IF PROGRAM =3 AND PA9 = 4) How much rebate would you need in order to decide to (IF ASKED PA5_P or PA5_C: [PA5_P or PA5_C], else show **[ACTION]**) through the **[PROGRAM]**?

____ (RECORD RESPONSE)
D DON'T KNOW
R REFUSED

PA9B (ASK IF PA9 <> 7) What additional information, assistance, or clarification would you need in order to participate in the **[PROGRAM]**?

(RECORD VERBATIM)

Important Factors in Decision-Making Processes

Next I'd like to ask some questions about decision making at your business.

I0a If you were considering implementing or modifying processes or installing new energy efficient equipment to save energy or money at your company, where would you look

D-13



for information regarding the new equipment or processes? (DO NOT READ, INDICATE ALL THAT APPLY)

- 1 Xcel Energy account manager
- 2 Xcel Energy Business Solutions Center representative
- 3 Other Xcel Energy program staff
- 4 Xcel Energy website
- 5 Xcel Energy account manager
- 6 General Internet search (e.g., Google search)
- 7 Contractor/vendor
- 8 Engineer
- 9 Manufacturer
- 10 Xcel Energy-sponsored event
- 11 Advertising campaign
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

10b And who would you contact to implement the new equipment or process? (DO NOT READ, INDICATE ALL THAT APPLY)

- 1 Xcel Energy account manager
- 2 Xcel Energy Business Solutions Center representative
- 3 Other Xcel Energy program staff
- 4 Contractor/vendor
- 5 Engineer
- 6 Xcel Energy
- 7 Manufacturer
- 8 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



- I1** 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
- ___ amount of program rebate
- ___ recommendation of utility
- ___ recommendation of contractor or supplier
- ___ compatibility with existing equipment or processes
- ___ initial purchase cost
- ___ operating cost
- ___ length of payback period (IF GT 5, What payback period do you strive for?)
- ___ efficiency level of new equipment
- ___ life of new equipment
- ___ if new equipment is readily available
- ___ environmental concerns
- ___ performance concerns
- ___ life-cycle costs
- ___ return on investment or ROI
- ___ capital investment or budget availability
- ___ money and energy savings
- ___ (ALWAYS READ LAST) some other consideration not already mentioned (SPECIFY)

- I2** Does your business have a policy that mandates the installation of energy efficient equipment when purchasing new equipment?

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

- I3** (IF I2 = 1) What is the policy? (PROBE AND SPECIFY)

(RECORD VERBATIM)

- I4** (IF PROGRAM <> 3) Does your business have a multi-year energy management plan in place with goals for reducing operational energy costs?

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



- I5** (IF I4 = 1) What are the goals of this energy management plan? (PROBE AND SPECIFY)
- (RECORD VERBATIM)
- I6** (IF PROGRAM <> 3) Does your business include energy conservation improvements in your capital or budget plans?
- 1 Yes (PROBE: How so?)
 - 2 No
 - D DON'T KNOW
 - R REFUSED
- I7** (IF PA0a <> 2) Have you ever had a rebate application denied by Xcel Energy because the equipment you purchased did not actually qualify for the program?
- 1 Yes (PROBE: What equipment were you submitting the rebate for?)
 - 2 No (SPECIFY TIMEFRAME AND EQUIPMENT FOR WHICH THE REBATE APPLICATION WAS DENIED)
 - D Don't know
 - R Refused
- I8** (IF I7= 1) Who told you that you would qualify for the program? (READ LIST)
- 1 A vendor or contractor
 - 2 Xcel Energy account manager
 - 3 Xcel Energy Business Solutions Center representative
 - 4 Other Xcel Energy program staff
 - 5 Another person in your company
 - 6 No one else, it was your understanding
 - 7 Or were you not sure of the eligibility and decided to apply anyway?
 - D Don't Know
 - R Refused



I9 What are some of the major obstacles or barriers that your business faces when considering implementing energy efficiency improvements at your facility? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 Need to incorporate purchases or plans into longer term budget
- 2 Lack of capital budget
- 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 and money saving opportunities
- 9 Lack of awareness/knowledge about equipment characteristics or performance
- 10 Lack of knowledge about how to obtain assistance from Xcel Energy
- 11 Low prioritization of energy efficiency or conservation in firm
- 12 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED

Satisfaction

SA6 (IF PA0a <> 1 SKIP) Next, I'd like you to tell me how satisfied you are with all of the Xcel Energy program offerings available to your business, using a 0-10 scale with 0 being very dissatisfied and 10 being very satisfied. (ROTATE LIST)

- a. ___ (0-10) The type of rebated equipment or improvements available through Xcel Energy's programs (If <5, probe: Why is that?)
- b. ___ (0-10) Requirements for energy efficient project rebate eligibility (If <5, probe: Why is that?)
- c. ___ (0-10) The amount of the rebates offered for equipment or improvements (If <5, probe: Why is that?)
- d. ___ (0-10) The information you have received from Xcel Energy about their programs (If <5, probe: Why is that?)
- e. ___ (0-10) The level of technical support and information available to you, including technical assessments and studies?

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 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) (PROBE IF RATING LT 5: Why do you say that? What could make your experience with Xcel Energy better?)

- D DON'T KNOW
R REFUSED



SA9 Considering the price you pay relative to the quality of the products and services you receive, how would you rate Xcel Energy's overall value, this time using a 0-to-10 scale where "10" means VERY GOOD VALUE and "0" means VERY POOR VALUE? (IF NECESSARY, SAY:) You can use any number from 0 to 10. (REPEAT SCALE IF NECESSARY)

_____ (0-10) (PROBE IF RATING LT 5: Why do you say that? What could make your value impression with Xcel Energy better?)

D DON'T KNOW

R REFUSED

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
- 5 Retail
- 6 Education
- 7 Religious worship
- 8 Public assembly
- 9 Health care
- 10 Service
- 11 Lodging
- 12 Public order and safety
- 13 Industrial/Manufacturing (SPECIFY)
- 14 Agricultural (SPECIFY)
- 15 Vacant (SPECIFY)
- 16 Leisure/Recreation (SPECIFY)
- 17 Government or City building
- 18 Other (SPECIFY IN DETAIL)
- D DON'T KNOW
- R REFUSED

(IF PROGRAM <> 3, SKIP TO F5)

F2_A Does the space covered by your Xcel Energy bill at [PREMISE ADDRESS]... (READ LIST)



- 1 occupy an entire free-standing building [SKIP TO F3]
- 2 occupy part of a free-standing building [SKIP TO F3]
- 3 or something else

F2_B Then which of the following best describes the space covered by your Xcel Energy bill at [PREMISE ADDRESS]? Is it . . . ? (READ LIST)

- 1 Located in an enclosed shopping mall
- 2 Located in an unenclosed shopping mall
- 3 Occupies part of a single building with apartments attached
- 4 Occupies an entire single building with apartments attached
- 5 Located in a complex of buildings
- 6 Space at this address is the common area of an apartment/rental property
- 7 Occupies part of a free-standing building; both manufacturing & office space
- 8 Other [SPECIFY]
- 9 DON'T KNOW
- 10 REFUSED

F3 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

F4 What is the approximate square footage of the space your business occupies at this location?

- ___ Square feet
- D DON'T KNOW
- R REFUSED



F5 What additional actions, other than the ones we have already discussed, has your business taken at its location(s) within the past three years in order to reduce its 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 efficiency programs (SPECIFY)
- 11 Facility-wide energy awareness training
- 13 Recommissioning or recommissioning
- 14 Process improvements
- 15 Installed high efficiency motors or drives
- 16 Installed high efficiency refrigeration equipment
- 17 Tuned up existing equipment
- 18 Participated in other Xcel Energy on-site assessment or completed a study
- 19 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



F5a What additional actions has your business considered implementing or planned to implement at this location within the next three years in order to reduce your energy use? (DO NOT READ; INDICATE ALL THAT APPLY)

- 1 None
- 2 Install high efficiency lighting equipment
- 3 Add lighting controls, occupancy sensors, and or time clocks
- 4 Install high efficiency cooling equipment
- 5 Install high efficiency heating equipment
- 6 Install high efficiency ventilation equipment
- 7 Add controls to the heating, ventilation or air conditioning systems to reduce use
- 8 Make changes to the heating, ventilation or air conditioning system maintenance schedule
- 9 Make changes to the building envelope such as insulation, window film, etc.
- 10 Participate in other Xcel energy efficiency programs (SPECIFY)
- 11 Facility-wide energy awareness training
- 13 Recommissioning or recommissioning
- 14 Process improvements
- 15 Install high efficiency motors or drives
- 16 Install high efficiency refrigeration equipment
- 17 Tune up existing equipment
- 18 Participate in other Xcel Energy on-site assessment or completed a study
- 19 Other (SPECIFY)
- D DON'T KNOW
- R REFUSED



F7 (IF HAVEN'T DONE ANYTHING OR HAVEN'T PLANNED TO DO ANYTHING) What are the reasons you (IF F5 = 1: haven't made) (or) (IF F5a = 1: aren't planning 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 and/or time 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 Capital budget issues
- 13 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 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 (Collect Contact Information)
- 2 No
- D DON'T KNOW

F10 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)



APPENDIX E: BENCHMARKING INTERVIEW GUIDE

Introduction

Identify Xcel Energy as the company commissioning this study; provide a brief description of Xcel Energy's Cooling Efficiency 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., DX units, economizers, chillers, etc.) 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.

Utility, program, and program manager: _____

E.1 PROGRAM SCOPE AND GOALS

- 1) How long has the program been offered?
- 2) What are your roles and responsibilities for the program? Is the program delivered internally or by a 3rd party implementer?
- 3) What are your program's goals and objectives? (*Probe for both written and informal*) Who sets the goals? Are they annual goals or multi-year goals? How does the program fit within your overall business portfolio goals?
- 4) Overall, how effective has your program been in achieving these goals and objectives (*Probe for actual or estimated savings, participant data*)? Are there ways you think the program could be more effective in achieving its goals?

E.2 MEASURES AND INCENTIVES

- 5) What measures are offered by your program? (*limit discussion to comprehensive list of prescriptive measures*)
 - a) Of those measures, which comprise the bulk of the program participation in terms of numbers? In terms of energy/demand savings goals?
 - b) How have these measure offerings changed over the last few years? (*Probe specifically if they have added any measures to their prescriptive offerings*)
 - c) Did you add or eliminate any measures this year? If yes, discuss why.
- 6) Does the program offer an optimization study component? If yes, what are the parameters of the study? Who conducts the study? Are study rebates offered?



- a) *(If offers studies)* What percentage of your customers implement the opportunities identified in the study within one year? What is the typical timeframe for implementing measures? What strategies have you employed to try and get customers to implement after they receive an audit/study?
- 7) How are the incentive levels for your measure offerings determined? *(If needed: are they based on estimated incremental costs and/or other factors?)*
 - a) What are the current rebate levels? *(Probe to see average incentives levels as a percentage of total project costs)*
 - b) What are the current rebate level payback estimates?
- 8) Of all your measures, which provide the greatest energy savings impact overall to your program (both kWh and kW), and which have the most participation?
- 9) Have 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) Do you accept applications from trade allies on behalf of customers?
 - b) 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 them?

E.3 TRADE ALLY OUTREACH

- 11) How does the program leverage the trade ally market infrastructure?
 - a) *(If allies utilized)* How do you conduct outreach to trade allies? Has it been effective? *(Probe about different market actors within the cooling supply chain)*
 - b) What do trade allies have to do to participate in the program (e.g. attend training, register, etc)
 - c) What tools or information do you provide to the trades to inform their customers about program offerings and requirements?
 - d) What types of trade allies typically participate in the program (e.g. HVAC contractors, distributors, ESCOs, engineering consultants, etc.)?
 - e) Do trade allies receive incentives from your program?



- i) *(If yes)* What are the incentive levels, and what is required of the trade allies to get them?

- (1) Are the incentives offered always or periodically? Why?

- ii) *(If no)* Have you ever offered these incentives?

- (1) *(If yes)* Why did you eliminate the incentives?

E.4 PROGRAM RECRUITMENT, OUTREACH, AND PARTICIPATION

- 12) What types of customers do you target for the program (business types, size, etc.)? How do you segment business customers? (sqft, demand, etc.)

- a) Typically which customer segments deliver the most participation/energy savings?

- 13) What is the mix of managed and non-managed accounts? *(Probe if they have undertaken any strategies to target medium-sized non-managed accounts)*

- a) 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?

- 14) 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? Case studies or success stories?

- 15) Describe the participation steps from the customer's perspective?

- 16) Why do customers typically decide to participate in the program? Do reasons vary by customer types (or segments)?

- 17) What are the major barriers to participation?

- 18) What external influences are impacting your program? How are you addressing them? *(Probe on impacts of federal legislation)*

E.5 PROGRAM IMPACTS

- 19) Have you performed any net-to-gross or spillover calculations for the program? At the portfolio level? *(If yes)* How were those derived, and what are the results? Can we see a copy of the study? *(If no)* Does your program incorporate net-to-gross, free-ridership or spillover, and if yes, what are those numbers?



20) How do you estimate and track penetration and standard practice in your market? Does this vary by customer segment?

21) How much of your overall energy savings for businesses is contributed by your program?

E.6 PROGRAM SUCCESSIONS AND CHALLENGES

22) What has worked particularly well with the program? What has been a problem?

23) What do you see as future challenges for the program?

E.7 CONCLUSION

24) Are there any other topics that we have not covered in this interview that we should be aware of about this program?

25) 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).

APPENDIX F: MARKET TRANSFORMATION

This appendix overviews the current industry thinking regarding market transformation resulting from utility demand side management programs, discusses market effects that may be resulting from Xcel Energy's Colorado Process Efficiency Program, and presents recommendations for assessing market effects more in future research.

F.1 INTRODUCTION

Demand side management (DSM) programs often include market transformation goals. Market transformation goals seek to overcome significant barriers to adoption in the market place. Examples of barriers include market actor awareness, performance, availability, incremental cost, difficulty of retrofit, and number of producers. Market effects result from DSM programs when they are able to positively change market barriers in a way that would allow greater penetration of the energy efficient technology.

The California Strategic Plan states that:

Market transformation activities do not produce the same short-term, or easily measured or apparent, results as resource acquisition programs. However, they can result in much larger, medium- to long-term results that can yield a much larger payoff.

The evaluation of Xcel Energy's Business DSM programs that Tetra Tech has led since 2010 has provided qualitative evidence that Xcel Energy's demand side management programs are laying the groundwork for market transformation. Some customer market effects include: increased customer awareness of efficient technologies and practices as a result of extensive marketing and outreach; increased customer understanding and acceptance of these technologies; and increased customer knowledge of potential savings as a result of payback tools, technical assistance, and other information provided through the programs. The programs also heavily engage trade allies through outreach, training, and sales tools. Qualitative evaluation research indicates that the programs are resulting in market effects by influencing changes in trade allies' stocking and sales practices.

The challenge is measurably quantifying market transformation resulting from Xcel Energy programs in order to capture all of the energy savings resulting from Xcel Energy's programs. To most effectively address this challenge, we focus on measuring market effects—as leading indicators of market transformation—as opposed to the larger task of measuring market transformation.

While a number of evaluation studies have been conducted over the past 15 years to estimate market effects, most of these efforts have not estimated net energy market effects. Instead, they have concentrated on measurement of indicators such as awareness, sales, and changes in practices by market actors. Evaluations estimating net market effects with energy estimates are still at an early stage of development. One major limitation is that these studies, which employ the highest levels of rigor, are expensive. However, this is a critically important field of research since the market effects of energy savings resulting from utility energy efficiency programs are likely to be substantial once documented.



California has been leading the nation in looking at market transformation and ways to credit investor-owned utilities (IOUs) for market effects resulting from their programs. California is funding a series of multi-staged market effects studies (available on www.calmac.org), which have a primary goal to “support the CPUC’s strategic planning efforts by clarifying whether energy savings from non-participant spillover can be quantified with sufficient reliability to be treated as a resource and, potentially, afforded shareholder incentive treatment” (CPUC 2007).

The California IOUs are tasked with developing Market Transformation Indicators (MTI) in addition to their Program Performance Metrics (PPM). While PPMs track progress toward short-term program specific objectives, MTIs measure progress on long-term program objectives. The IOUs were directed to select a subset of MTIs for data collection, tracking, and reporting as part of their 2010-2012 evaluations¹⁶. They are to be “objective, quantitative indicators of the progress of a program toward the short and long-term market transformation goals and objectives in the Strategic Plan.” (D. 09-09-047, 91).

F.2 PROCESS EFFICIENCY MARKET EFFECTS CHARACTERIZATION

While the 2012 evaluation scope did not include specifically assessing market effects, the evaluation research did find some evidence of market effects with customers. Given the program’s design of holistic treatment of customer facilities and in-depth support directly to customers, with little involvement of trade allies, we would expect some market effects among participating trade allies, but not the larger trade ally network.

There is evidence of market effects in participants’ corporate culture and policies. Feedback from participants indicates that the program has impacted the role of energy conservation in core business practices. Half the interviewed firms said their participation in the program resulted in written energy plans and policies. Those who already had plans in place prior to the program reported an increase, improvement or acceleration in the previous energy plans. Firms are taking a wide variety of steps to more actively monitor energy use after initial participation including formally staffing new roles, metering additional equipment/facilities and monitoring energy use in real-time.

As hypothesized, the program does not engage trade allies in a manner that would affect their practices and result in market effects. However, a couple of trade interviewees commended the program’s ability to engage upper management. We believe this engagement of upper management is critical in helping change corporate culture and practices.

F.3 CONCLUSION

If capturing market effects resulting from programs is a priority for Xcel Energy, we recommend integrating market transformation objectives specifically into evaluation scopes by identifying expected market effects and then developing market transformation indicators related to the identified market effects. This will allow evaluators to more fully document and

¹⁶ Public Utilities Commission State of California, Resolution E-4385, December 2010.

describe all of the impacts resulting from Xcel Energy's programs. We then recommend identifying and prioritizing those programs where significant nonparticipant spillover is expected and additional research makes the most sense to fund as market effect studies can be expensive. For prioritized programs, our experience and review of the literature recommends particular emphasis on nonparticipant spillover in order to quantify energy and demand savings. For prioritized programs, the evaluation team should then discuss with Xcel Energy any additional research needs to support defensible estimates of nonparticipant spillover.

One challenge within the current evaluation framework is that a broader look at market effects (and therefore nonparticipant spillover) is at the market, instead of program, level as discussed in the California Market Transformation Scoping Study:

Market transformation is a change in the structure of a market or the behavior of participants in a market that is reflective of an increase in the adoption of energy efficient products, services, or practices and is causally related to market intervention(s).¹⁷

This definition stresses the market rather than the program nature of market effects. Because Xcel Energy may offer multiple programs to a target market that may be evaluated in different years, it may be challenging to take a broader look at the market in a given evaluation year. Over time, the evaluation cycle could be configured to evaluate programs that serve the same market in the same year to think more comprehensively about measuring market effects. The need to look broadly at the market also supports the need for the evaluations to include periodic baseline surveys either instead of or in addition to the nonparticipant surveys that currently take place each year for an evaluated program.

As one of the goals of the market transformation research is to quantify energy and demand savings, we suggest focusing on defensible and rigorous nonparticipant spillover estimates as the primary objective of additional market transformation research. The quantification of nonparticipant spillover is one of the main focuses of the most recent California market effects studies. To do this, we recommend the following additional research activities be considered on a program-by-program basis for the Business DSM programs for future evaluation efforts:

1. **Expand both the number and scope of trade ally/influential vendor surveys.** One of the highest levels of rigor to quantify market effects involves tracking sales data. For example, appliance sales have been tracked biennially in Wisconsin since 1993.¹⁸ California also has market share tracking studies and the Northwest Energy Efficiency Alliance tracks changes in behaviors for many of their programs. However, while preferable due to the objectiveness of the information, sales data can be difficult to obtain. Manufacturers, distributors, and vendors are protective of their sales

¹⁷ Joe Eto, Ralph Prael, and Jeff Schlegel. *A Scoping Study on Energy-Efficiency Market Transformation by California Utility DSM Programs*. (Berkeley, CA: Ernest Orlando Lawrence Berkeley National Laboratory, 1996). LBNL-39059UC-1322, 9.

¹⁸ Appliance Tracking Study, www.ecw.org

information as that could be considered competitive intelligence. Additionally, it is important that sales studies include a representative population of manufacturers/distributors/vendors; we have seen that participants in studies such as this may be the most active groups, which can bias the results. Last, developing a robust sales database and identifying trends over time can be a very time intensive and expensive endeavor.

Therefore, we recommend Xcel Energy consider using vendor surveys to estimate sales volumes. Vendors can be asked about sales volumes and efficient equipment sales shares for conditions with and without the program, or for in-territory and comparison area sales. This approach can be analyzed similarly to market-level sales data, although data needs to be reviewed carefully as vendors may not be able to provide accurate estimates. The difference is that the market sales data approach usually refers to comprehensive or nearly comprehensive reporting of sales (of trade allies participating in the study). By contrast, vendor surveys may collect “best guess” estimates of sales volumes and shares from a sample, then use sampling weights and other measures of size (such as employment) to expand the survey responses to the full market. This is an industry accepted approach being used in current market effects studies such as for the Massachusetts C&I New Construction High Bay Lighting Market Effects study being conducted for different utility program administrators.

This would require a much more robust sample than what is currently being used in the evaluation scope. If this was implemented, we would recommend a census sample of all participating trade allies be used from the last 3 years as well as including a number of nonparticipating vendors. We would then conduct quantitative trade ally interviews instead of the current 10 qualitative trade ally interviews, which are supplemented with influential vendor surveys identified in participant research. We believe a robust trade ally sample could be done most cost-effectively through an internet survey with a census sample of vendors with follow-up phone calls to non-responders. In 2010 and 2011, we have seen increased trade ally interest in completing interviews via email responses instead of the telephone, which indicates an internet survey may be successful with these market actors.

2. **Implement Delphi expert panel to estimate nonparticipant spillover for prioritized programs.** Some of the recent market effects studies in California and elsewhere (Arizona) are employing Delphi techniques¹⁹ to estimate nonparticipant spillover. A typical study presents expert panelists with detailed data regarding practices, sales, etc. Panelists are asked to complete two rounds of detailed surveys. The second round provides a comparison with other panelists’ responses and logic, and allows the panelists the opportunity to change their answers. Panelists can be asked to estimate the proportion of electricity and natural gas savings attributable to a

¹⁹ The Delphi technique is often characterized as a group communication process or forecasting method that relies upon a panel of experts to develop an estimate or group judgment on a topic or issue. It is an iterative process that involves at least two rounds of questions or interviews with the panels. The Delphi technique is based on the principle that structured responses from experts will be more accurate than unstructured responses from individuals (Hsu and Sandford 2007; Linstone and Turoff 1975; Ludwig 1997).



utility program and to other factors such as economy, energy prices, etc., and to estimate the percentage of net savings attributable to the program.

A challenge with market effects is also attributing changes to utility program efforts since programs are only one of many influences in a market. Market effects can be difficult to disentangle from other external factors such as the economy, fuel prices and federal programs (such as the recent ARRA funding into the energy efficiency market). A particular value of the Delphi approach is providing a defensible attribution estimate of market effects specific to utility programs.

3. Assess past research to support near-term program market effects research and consider implementing comprehensive baseline studies going forward.

Market effects looks at longitudinal changes or what has taken place in the market *over time*. In order to do this, a baseline is important in order to quantify changes. A specific example of the value of longitudinal data is demonstrated in the Attitude Awareness Usage (AAU) study that was conducted in 2006 and 2010. The study was able to quantify a measureable change over time in customer awareness of Xcel Energy programs. A similar approach should be taken with the DSM market effects research in order to measure trends over time.

In the near term, we believe there is a body of past research to draw on to reconstruct a baseline such as past evaluation and potential studies. Xcel Energy has been conducting evaluation research and other DSM program research for a number of years; however, we are uncertain to the extent market transformation information was collected in the past. We recommend in the near term that the market research evaluation managers and the third-party evaluation team (currently Tetra Tech) assess past research that can serve as a baseline for current evaluation research.

In summary, the industry has recognized that utility energy efficiency programs are resulting in market effects and it is important to capture these effects as in many cases, they are significant. However, the approaches for doing so are still newly developing. It is an opportune time to discuss further how greater measurement of market effects can be included in research going forward.