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Xcel Energy

Evaluation of the Computer Efficiency Program—Colorado

December 21, 2016

NMR Group, Inc.

Xcel Energy

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We also wish to thank Xcel Energy's DSM product management staff who provided invaluable insight into their programs. These individuals participated in on-going evaluation deliverable reviews and discussions, and graciously responded to follow-up questions and documentation requests. For the evaluation of the For the evaluation of the Computer Efficiency program, we would like to specifically thank Meagan Madden and Renae Wrich.

The Tetra Tech Evaluation Team was made up of the following key members:

Tetra Tech: Steve Drake, Lark Lee, Pam Rathbun, Richard Hasselman, Kimberly Bakalars, Carrie Koenig, Lisa Stefanik, Theresa Holmes, Chuck Conrad, Scott Wagner, and Luke Ramirez.

NMR Group: Tom Mauldin, Nicole Rosenberg, Scott Walker, Kiersten Von Trapp, and Melissa Meek.

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EXECUTIVE SUMMARY

Xcel Energy is looking for meaningful ways to improve the elements of its demand side management (DSM) programs, its customer-reach capabilities, and the operational 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 NMR Group—hereafter the "Tetra Tech team") to conduct objective evaluations of their demand side management (DSM) programs in Colorado.

The Computer Efficiency program in Colorado was evaluated in 2016. This executive summary provides an overview of the 2016 process and impact evaluation of the program.

I. PROGRAM DESCRIPTION

Xcel Energy's Computer Efficiency program in Colorado provides upstream manufacturer incentives and downstream prescriptive rebates. The upstream component offers incentives to manufacturers that design, install, and deliver desktop personal computers (PCs) equipped with high-efficiency power supplies. The downstream component provides rebates to business customers who implement a Virtual Desktop Infrastructure (VDI) strategy or install PC Power Management software.

Table 1-1. Incentive and Rebate Levels

Delivery Channel	Measure	Incentive Levels
Upstream	80 Plus Bronze power supply	$5 per unit
	80 Plus Silver power supply	$10 per unit
	80 Plus Gold power supply	$15 per unit
	80 Plus Platinum power supply	$20 per unit
Downstream	Thin or Zero Client (VDI)	$60 per unit
	PC Power Management	$5 per desktop controlled

The upstream component of the program accounts for the majority of program savings through high volume sales. Currently, the downstream measures contribute only a small proportion of the overall program savings. Due to the increase in efficiency over the past several years, and shifts from PC sales to laptops and tablets, program savings have steadily declined over the past few years.

UPSTREAM INCENTIVES

The ENERGY STAR® program for certified energy efficient power supplies, 80 PLUS®, was announced in 2004 and launched in 2005. Xcel Energy has worked closely with ENERGY STAR® and has been a sponsor of the 80 PLUS program since 2007. HP joined the program in 2006, followed by Dell in 2007, and Lenovo in 2009. With a few manufacturers on board, 80 PLUS Bronze, Silver, and Gold desktops were introduced in 2008. Platinum desktops were introduced in 2009.

The upstream component of Xcel Energy's Computer Efficiency program incentivizes manufacturers for installing energy efficient power supplies in desktop computers sold to customers in Xcel Energy's territory. Ecova implements the upstream component of the program for Xcel Energy by working directly with regional and national computer manufacturers. They reach out to and maintain the relationship with manufacturers, track performance goals and efficiency ratings, and send invoices to Xcel Energy.

Ecova ensures that only program-qualifying sales of equipment receive incentives. The raw data output files are checked to ensure they match the sales reports that are gathered monthly from all the manufacturers before they are entered into the program tracking database. The database contains ENERGY STAR qualifying products and customer zip codes that can be used to check against utility zip codes to ensure that only qualifying products and customers within the utility's territory are incentivized.

Additional QA/QC is not performed for the upstream component of the program and installation rates are assumed to be 100 percent for a few reasons: 1) because no customer data is collected, 2) manufacturers only ship to customers in Xcel Energy service territories, and 3) the value of the new equipment/technology deteriorates so quickly that customers tend not to stockpile equipment.

Taking effect beginning in 2017, Xcel Energy will reduce the upstream incentive levels for 80 PLUS power supplies to $3 for Bronze, $5 for Silver, $8 for Gold, and $10 for Platinum. In addition, Xcel Energy has substantially reduced per-unit gross savings estimates for qualifying power supplies, using a weighted average of desktop power supplies currently in the market as the baseline condition. The new baseline assumption assumes 62 percent of power supplies in the market are Bronze level efficiency, based on manufacturer research.

DOWNSTREAM REBATES

Starting in 2011, the Computer Efficiency program began offering downstream customer rebates for Virtual Desktop Infrastructure (VDI) installations. Xcel Energy defines VDI as a desktop computing architecture that centralizes the desktop operating system and applications environment from a physical machine to create a client server computing model. The user's desktop is hosted remotely and accessed via an access device over the network. The user no longer has a physical PC. Qualifying VDI installations may also be termed Thin Client or Zero Client Computing.[1] Xcel Energy business customers are currently eligible for a prescriptive rebate of $60 per "thin client" or "zero client" installed in lieu of a desktop PC.

In 2013, the program also added downstream customer rebates for PC power management software. Rebates of $5 per computer are available for customers who enable PC Power Management software from their data center or other central location that manage PCs within Xcel Energy's territory. PC Power Management should give the IT Administrator easily-accessible central control over the power management settings of networked workstations.

[1] Xcel Energy defines Thin Client Computing as including a CPU, graphics coprocessor, RAM, or local storage like a hard drive, solid state drive, or simply flash memory. Xcel Energy defines Zero Client Computing as no client-side processing or management; no CPU, no memory, no operating system, no drivers, no software, and no moving parts.

Rebates apply only to applications on desktop PCs that operate during a typical single shift operation and prevent computer users from overriding the power management settings. At this time, installations on laptops, tablets, and other hardware such as virtual desktops, printers, and monitors do not qualify for a prescriptive rebate and PCs used in multiple shifts or not used throughout the entire year do not qualify but can be applied for through the Custom Efficiency program.

Outreach for the downstream component is handled primarily by Xcel Energy account managers and the Business Solutions Center (BSC) staff. While Xcel Energy Account Managers focus on their largest customers, the BSC targets small to mid-size commercial customers and reaches out for energy efficiency opportunities. They also walk customers through the application process.

Customers have 12 months from the invoice purchase date to apply for a downstream rebate from Xcel Energy. Applications must include a copy of the detailed invoice showing manufacturer/model number and a copy of the qualifying equipment specification sheet that shows the equipment's wattage or watts. Upon application approval, Xcel Energy issues a rebate check for receipt within six to eight weeks. Customer purchases are tracked at the account and premise level, but rebates are often awarded at the corporate level.

A third party, Franklin Energy, conducts random field audits of 10 percent of projects monthly to verify equipment installation. Xcel Energy provides the third party contractor with a guide of what to look for during the audit. The audit firm receives a list of the projects, randomly chooses 10 percent of projects, and sets a time with the customer to visit and verify the make and model and that the units are installed and operating in Xcel Energy's service territory.

II. EVALUATION METHODOLOGY

The Tetra Tech team conducted an evaluation of the Computer Efficiency programs in both Colorado and Minnesota in 2016. Due to the similarities in program design and implementation, several evaluation activities were conducted jointly across both territories. The process evaluation provides Xcel Energy with a thorough understanding of customer and trade partner awareness, satisfaction, attitudes, and behaviors as well as benchmarked information for similar programs offered throughout the country. The evaluation's net-to-gross (NTG) research employed triangulation methods for best estimates of program attribution.

The evaluation research included the following primary activities: five Xcel Energy staff internal review interviews, four Minnesota participant customer surveys[2], 75 nonparticipant customer surveys in Colorado, five participating upstream manufacturer interviews, one interview with an influential vendor in Minnesota, and a benchmarking study of seven other utility programs including four peer program manager interviews.

[2] The evaluation team also attempted to complete interviews with participating customers in Colorado, but no customers responded. Given the delivery method similarities for the downstream Computer Efficiency program across territories, Minnesota responses are presented for comparison purposes.

III. SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

The evaluation research shows that the Computer Efficiency program is generally operating well. Overall, the Computer Efficiency program evaluation found high manufacturer and participant satisfaction with both the upstream and downstream components of the program. In addition, evidence suggest the program's upstream incentives to manufacturers is having a positive impact on the proportion of 80 PLUS power supplies installed in desktops sold in Xcel Energy's Colorado territory. Manufacturers are using the program incentive to fund marketing and promotional efforts through general marketing, sales staff and reseller education, targeted website banner ads, and spiffs to sales staff for promotion of 80 PLUS power supplies.

Although there was some expectation that the upstream program component had led to market transformation and routine sales of the 80 PLUS power supplies, causing other program administrators to discontinue their incentives, estimates from EPA and Ecova research indicate that the majority of desktops sold are not ENERGY STAR® certified and sales volumes above 80 PLUS Bronze are very low. These findings suggest the market has not transformed beyond Bronze level power supplies, revealing opportunity for continued program influence in advancing the market toward more efficient power supplies.

At the same time, the program's downstream rebates for PC power management and VDI has struggled to gain traction, with low participation to date. While customers appreciate account manager outreach regarding programs, Xcel Energy recognized identification of IT contacts as one of the leading challenges for the downstream rebate program component. Evaluation activities with nonparticipants and vendors uncovered low awareness, corresponding with low participation rates. However, PC power management software vendors are actively searching out rebate programs to help market their software, which is leading to increased interest in the product.

Based on the evaluation findings, the evaluation team offers the following recommendations for Xcel Energy's consideration:

Program Recommendations
• The evaluation team recommends using the current upstream NTG estimate of 88 percent prospectively in Colorado across all power supply efficiency levels. In addition, we also recommend the continued use of the current downstream NTG estimate of 80 percent prospectively in Colorado until more quantitative research can be conducted with a larger number of participants.
• Continue to monitor ENERGY STAR industry data for changes in the proportion of Bronze power supply installations.
• Investigate the feasibility of engaging additional manufacturers that are not currently participating in the program. The resources needed to recruit and enroll new manufacturers should be weighed against the benefits of impacting additional sales of 80 PLUS power supplies.
• Consider implementing additional outreach methods for increasing customer awareness and influence of downstream rebates by partnering with PC power management vendors for outreach, cross-promoting PC power management with other control-based rebate

marketing, and emailing or mailing bill inserts to commercial customers to highlight the program benefits and procedures for participating.
• Continue offering upstream program incentives for 80 PLUS power supplies to support marketing and promotion of energy efficient power supplies to commercial customers. Also, consider including promotional messaging for the upstream incentive in downstream program marketing materials to supplement manufacturers' marketing efforts.
• Monitor impacts of reducing upstream incentives on manufacturer sales, marketing, training, and spiff funding.
• Review PC power management incremental cost assumptions and evaluate the feasibility of increasing the downstream incentive to encourage additional participation.
• Maintain current internal communication processes and continue to ensure there are adequate resources to effectively administer program functions.
• Consider adding supplemental information to support QA/QC efforts, such as more specific IT contact information, to the program application and Salesforce. Alternatively, consider developing a standardized template for account managers to use when collecting and tracking contacts, discussions, and installations for QA/QC to maintain consistency and collect needed information.
• Increase outreach to commercial customers that targets accounts payable, Vice Presidents, CIOs, and sustainability departments.
• Increase engagement with PC power management software vendors to help promote program offerings to Xcel Energy customers.
• Educate PC power management vendors on program eligibility requirements that may preclude schools from participating unless they operate the full year. Additionally, explore feasibility of targeting marketing campaigns to school districts and universities that operate with a more consistent, single-shift schedule.
• Continue performing QA/QC on PC power management to ensure issues are identified and resolved quickly. Protocols for checking PC power management should include running system reports and checking that a sample of individual machines are controlled.
• Review the savings opportunities from small form factor or mini towers.
• Maintain high satisfaction rates through clear and consistent communication with Ecova, manufacturers, account managers, and customers.

Specific key findings and recommendations from the evaluation are discussed below.

NET-TO-GROSS

The NTG research found qualitative evidence to support current planning assumptions for upstream measures; however, a limited number of customer self-reports suggest lower attribution for downstream measures.

Participating manufacturers report using upstream program incentives for marketing and outreach efforts to increase customer awareness and interest in higher efficiency level power supplies, especially for Gold and/or Platinum. Based on feedback from manufacturer

interviews, the Bronze efficiency level has become a more consistent installation among participating national manufacturers. The one exception may be for regional manufacturers, as there is qualitative evidence that the Xcel Energy incentives have a larger influence on their marketing and stocking practices for Bronze level power supplies.

Incentive data also show that Gold and Platinum power supplies are not consistently offered by all manufacturers, indicating that the market has not transformed past Bronze level efficiency, even for participating manufacturers. Without consistent offering of the efficiency levels across all manufacturers, and the slippage of a proportion of incentivized units back to Bronze from 2014 to 2015, the incentive at these higher levels appears to be making a difference and influencing business customer purchasing behaviors. While it appears that the participating manufacturers have been influenced to shift to a higher proportion of 80 PLUS power supplies, with about 63 percent of their desktops certified ENERGY STAR v6, EPA estimates that overall approximately 40 percent of desktops sold annually are ENERGY STAR v6 certified. In addition, the participating manufacturers represent about 50 percent of desktop sales in the market, with the other 50 percent made up of a large number of smaller manufacturers each contributing approximately two percent on average.

Taking effect beginning in 2017, Xcel Energy has substantially reduced per-unit gross savings estimates for qualifying power supplies, using a weighted average of desktop power supplies currently in the market as the baseline condition. The new baseline assumption assumes 62 percent of power supplies in the market are Bronze level efficiency, based on manufacturer research. While feedback from national manufacturers indicates lower program influence on future installations of Bronze level power supplies compared to higher efficiency levels, the adjustment for naturally occurring Bronze level installations with the new gross savings technical assumptions, along with evidence from regional manufacturers that the program is still influencing sales of Bronze level over lower efficiency levels, supports the current planning NTG ratio used in Colorado as a reasonable attribution estimate (when coupled with the new gross savings assumptions) to estimate net savings.

Due to limited participation and low response rates, the evaluation team was only able to conduct primary research with four unique downstream participant customers of the Minnesota Computer Efficiency program, and no Colorado participants were able to be interviewed. Consequently, the downstream participant results do not support a robust quantitative point NTG estimate generalizable to future participants. However, self-report results from downstream participants indicate high levels of free-ridership and lower attribution than current planning estimates.

Feedback from nonparticipating customers and vendors indicates low overall customer awareness of downstream rebates that could be improved over time with increased promotion and outreach. Increased downstream participation would permit more robust NTG research in the future.

> *Recommendation #1: The evaluation team recommends using the current upstream NTG estimate of 88 percent prospectively in Colorado across all power supply efficiency levels. In addition, we also recommend the continued use of the current downstream NTG estimate of 80 percent prospectively in Colorado until more quantitative research can be conducted with a larger number of participants.*

Recommendation #2: Continue to monitor ENERGY STAR industry data for changes in the proportion of Bronze power supply installations.

Recommendation #3: Investigate the feasibility of engaging additional manufacturers that are not currently participating in the program. The resources needed to recruit and enroll new manufacturers should be weighed against the benefits of impacting additional sales of 80 PLUS power supplies.

Recommendation #4: Consider implementing additional outreach methods for increasing customer awareness and influence of downstream rebates by partnering with PC power management vendors for outreach, cross-promoting PC power management with other control-based rebate marketing, and emailing or mailing bill inserts to commercial customers to highlight the program benefits and procedures for participating.

PROGRAM DESIGN

Manufacturers leverage upstream program incentives to fund marketing of 80 PLUS power supplies to customers.

Manufacturers feel that marketing and promoting the energy efficient power supplies is critical to increasing awareness of and interest in that aspect of the desktop. Otherwise, customers focus on other PC characteristics and do not think to specify energy efficient power supplies.

All five manufactures apply the Xcel Energy incentives to marketing and outreach efforts, which they feel have increased awareness and interest over the past several years. Program incentives are leveraged for training to educate reseller and sales staff on the benefits of energy efficient power supplies, targeted marketing activities that include regional website banner messages, and funding of spiffs paid to sales reps to promote and sell 80 PLUS power supplies in desktop units.

While the incentives fund marketing and outreach from the manufacturers, those same manufacturers feel that it is important for commercial customers to also receive the energy efficiency message from Xcel Energy. This helps to substantiate the manufacturer promotion and bring more awareness to an aspect of the desktop that is still often overlooked.

Recommendation #5: Continue offering upstream program incentives for 80 PLUS power supplies to support marketing and promotion of energy efficient power supplies to commercial customers. Also, consider including promotional messaging for the upstream incentive in downstream program marketing materials to supplement manufacturers' marketing efforts.

Upstream incentive levels are acceptable to manufacturers, but Xcel Energy's downstream program offers the lowest prescriptive PC power management rebate of the programs benchmarked.

Manufacturers have no issues with the incentive amounts available for efficient power supplies and Xcel Energy offers higher incentives for each efficiency level than Otter Tail Power and Efficiency Vermont, although Xcel Energy incentive amounts will be reduced to similar levels in 2017.

Benchmarking of six other downstream PC power management rebates show that Xcel Energy offers the lowest rebate ($5 per PC) compared to other benchmarked programs, ranging from $6 to $15, with three peer utilities offering $10 per PC controlled. Vendors find rebates of $5 to $15 covers the cost of the PC power management software and enables them to offer the software for free. However, when rebates are on the low end of the scale, it requires a larger project with more controlled computers to cover the software cost, which can impact participation. Downstream participation is currently low and contributes only a small proportion of program savings.

> *Recommendation #6: Monitor impacts of reducing upstream incentives on manufacturer sales, marketing, training, and spiff funding.*
>
> *Recommendation #7: Review PC power management incremental cost assumptions and evaluate the feasibility of increasing the downstream incentive to encourage additional participation.*

PROGRAM ADMINISTRATION

Internal processes are well defined and coordination within the internal Xcel Energy team is working well.

Xcel Energy has a well-developed and coordinated DSM staffing infrastructure. Internal communications appear to be working well. Program processes and staff roles are well defined and understood, and staff generally felt that they had sufficient and appropriate resources to effectively administer the program. Staff juggle multiple responsibilities, which can be demanding; however, Xcel Energy has demonstrated a commitment to identifying and addressing staffing needs as they arise.

> *Recommendation #8: Maintain current internal communication processes and continue to ensure there are adequate resources to effectively administer program functions.*

Account managers are a key outreach arm and a source of customer and project information, although data tracking practices are not consistent.

All four downstream Minnesota participants interviewed heard about the program from account managers and a high proportion of nonparticipants prefer to learn of program opportunities from their account managers. Xcel Energy Account Managers track customer discussions, project leads, and the location of installed and rebated equipment within their own spreadsheets. This can be a tedious but necessary activity to collect the information needed for the QA/QC process. As each account manager compiles their own spreadsheet, there is inconsistency in the data collected and tracked. Providing a basic consistent framework for the account managers to use with customers may help manage expectations in terms of project tracking and streamline the QA/QC process. This tracking information may also be useful to mine for data such as successful roles to contact, timing of contact versus decision to install, and lag time between learning of rebates and project completion.

> *Recommendation #9: Consider adding supplemental information to support QA/QC efforts, such as more specific IT contact information, to the program application and Salesforce. Alternatively, consider developing a standardized template for account*

managers to use when collecting and tracking contacts, discussions, and installations for QA/QC to maintain consistency and collect needed information.

PROGRAM IMPLEMENTATION AND DELIVERY

Customer awareness of downstream rebates is very low.

All four downstream participants interviewed as part of the evaluation reported learning of the downstream rebates from account managers after making the decision to implement eligible projects. In addition, nonparticipant customer awareness of the Computer Efficiency program was low (15 percent in Colorado).

Although customer awareness of other programs is quite a bit higher than awareness of the Computer Efficiency program, many customers are aware of the need to save energy and are taking steps to do so. When asked about other energy efficiency actions their business has taken within the past two years in order to reduce energy use, nonparticipants mentioned actions such as participating in demand response programs, purchasing high efficiency equipment, and installing solar. Almost 10 percent indicated they take some action to curb use when the business is closed by manually adjusting thermostats, reviewing scheduling for occupied versus unoccupied times, and turning off lights and other equipment.

As Xcel Energy staff have experienced, it is difficult to reach the appropriate staff within organizations to increase awareness of downstream computer efficiency rebates. Utility account managers typically work with business customer facility managers for most energy efficiency projects. Computer efficiency measures require communication with different staff within the customer organization. Depending on the type of organization, it may be IT staff, sustainability staff, accounts payable, or financial management staff.

Recommendation #10: Increase outreach to commercial customers that targets accounts payable, Vice Presidents, CIOs, and sustainability departments. Specific methods and messaging options worth consideration include:

- *Cross-promoting the Computer Efficiency program, especially the PC power management rebates, with other controls products such as occupancy sensors, programmable thermostats, and EMS. Marketing messages could highlight the variety of rebates available from Xcel Energy for installations that help customers save energy when they close each day.*
- *Training third-party contractors to proactively identify and promote opportunities for PC power management or VDI during commercial energy audits or assessments.*
- *Leveraging email for direct marketing campaigns, which enables the easy transfer of information within a firm to the correct decision-maker.*
- *Listing trade partners on the Computer Efficiency program webpage and exploring opportunities for cross-promotion. Update the list as trade partners are identified as working with PC power management or VDI opportunities.*

School districts and universities are key targets for PC power management software vendors.

IT decision-makers can be hard to reach. Software vendors have found schools most receptive to PC power management opportunities in conjunction with security software. They also market to municipalities and corporate customers. It is important to note that many schools may not qualify for the Computer Efficiency program as they do not operate on a single shift schedule throughout the year.

PC power management vendors seek out utility program rebates to offset or eliminate incremental costs to customers. Vendors of PC power management software search out utility rebates and conduct outreach to potential customers by marketing the reduced-cost or preferably free installation opportunities. One PC power management vendor has already conducted a promotional webinar for Colorado and New Mexico school districts that generated interest for a few projects. This vendor just recently became aware of the program and was the only one at the time of the evaluation that was aware Xcel Energy offered rebates.

Additionally, nonparticipant businesses were asked where they were likely to look or who they would contact for information in the future if they were considering energy efficiency upgrades. Over 40 percent would contact a contractor or vendor.

> *Recommendation #11: Increase engagement with PC power management software vendors to help promote program offerings to Xcel Energy customers.*
>
> *Recommendation #12: Educate PC power management vendors on program eligibility requirements that may preclude schools from participating unless they operate the full year. Additionally, explore feasibility of targeting marketing campaigns to school districts and universities that operate with a more consistent, single-shift schedule.*

QA/QC protocols are critical to maintain measure persistence and customer satisfaction for PC power management measures.

Currently, the program works with a third party contractor to perform on-site verification audits with a random sample of ten percent of completed projects. Benchmarked program managers emphasized that QA/QC protocols are particularly important for the PC power management measure. Issues with PC power management software performance can cause participants to remove it, leading to dissatisfaction with the program and utility, as well as erosion of savings.

> *Recommendation #13: Continue performing QA/QC on PC power management to ensure issues are identified and resolved quickly. Protocols for checking PC power management should include running system reports and checking that a sample of individual machines are controlled.*

MARKET RESPONSE

The evaluation research suggests the Computer Efficiency program has increased sales of 80 PLUS power supplies, but laptops, tablet, and smaller form factors are beginning to erode the desktop market.

Manufacturers feel that some energy-savvy customers are beginning to request higher efficiency, but the majority of commercial customers are still not as focused on efficiency of the desktops in comparison to other system requirements and options.

Bronze may be considered the lowest ENERGY STAR® efficiency now, but manufacturers that have progressed to Gold and Platinum efficiency levels would not sell as many of the higher efficiency power supplies without the Xcel Energy incentives. Most manufacturers feel that sales of efficient power supplies would eventually decrease if the program were not available as the incentives go directly to support marketing efforts by all manufacturers.

Although a couple of the manufacturers are selling high proportions of Gold and Platinum efficiency power supplies, sales levels have not been sustained over multiple years. Sales of Gold and Platinum level power supplies began to increase in 2013 but have reverted back a bit to the Bronze level in 2015. Manufacturers feel this is due to cost constraints for purchasing companies and higher efficiency power supplies add to the cost of the unit.

Incentive data show that Gold and Platinum power supplies are not consistently offered by all manufacturers, indicating that the market has not transformed past Bronze level efficiency, even for participating manufacturers. Without consistent offering of the efficiency levels across all manufacturers, and the slippage of a proportion of incentivized units back to Bronze from 2014 to 2015, the incentive at these higher levels appears to be making a difference and influencing business customer purchasing behavior.

However, customers are looking for smaller units, which companies are beginning to provide. These "smaller form factors"[3] are not eligible for the program incentives and may be contributing more to the decrease in incentivized units than laptops or tablets, according to manufacturers.

> *Recommendation #14: Review the savings opportunities from small form factor or mini towers.*

Satisfaction with Ecova, Xcel Energy, and the Computer Efficiency program are all high.

Upstream manufacturer satisfaction with Ecova is high. Manufacturers are getting the information they need from Ecova and feel they have been very responsive to all requests.

Customer satisfaction with Xcel Energy is high. Overall participant satisfaction with Xcel Energy was 8.3 while nonparticipant satisfaction with Xcel Energy was 7.7. Participant customer satisfaction with the Computer Efficiency Program is also high. Survey responses indicate that participants are happy with all aspects of the program. Mean ratings varied from a 9.7 mean rating for contractor quality to 7.3 for the amount of energy savings since the project was completed.[4] Two of the four participants said their experiences with the program have increased their satisfaction with Xcel Energy overall.

> *Recommendation #15: Maintain high satisfaction rates through clear and consistent communication with Ecova, manufacturers, account managers, and customers.*

[3] In computing, the form factor is the specification of a motherboard, which generally dictates the overall size of the case.

[4] On a 0-10 scale with 0 being "very dissatisfied" and 10 being "very satisfied."

1. INTRODUCTION

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1.1.1 Upstream incentives

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1.1.2 Downstream rebates

Starting in 2011, the Computer Efficiency program began offering downstream customer rebates for Virtual Desktop Infrastructure (VDI) installations. Xcel Energy defines VDI as a desktop computing architecture that centralizes the desktop operating system and applications environment from a physical machine to create a client server computing model. The user's desktop is hosted remotely and accessed via an access device over the network. The user no longer has a physical PC. Qualifying VDI installations may also be termed Thin Client or Zero Client Computing.[5] Xcel Energy business customers are currently eligible for a prescriptive rebate of $60 per "thin client" or "zero client" installed in lieu of a desktop PC.

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Outreach for the downstream component is handled primarily by Xcel Energy account managers and the Business Solutions Center (BSC) staff. While Xcel Energy Account Managers focus on their largest customers, the BSC targets small to mid-size commercial customers and reaches out for energy efficiency opportunities. They also walk customers through the application process.

Customers have 12 months from the invoice purchase date to apply for a downstream rebate from Xcel Energy. Applications must include a copy of the detailed invoice showing manufacturer/model number and a copy of the qualifying equipment specification sheet that shows the equipment's wattage or watts. Upon application approval, Xcel Energy issues a rebate check for receipt within six to eight weeks. Customer purchases are tracked at the account and premise level, but rebates are often awarded at the corporate level.

A third party, Franklin Energy, conducts random field audits of 10 percent of projects monthly to verify equipment installation. Xcel Energy provides the third party contractor with a guide of what to look for during the audit. The audit firm receives a list of the projects, randomly chooses 10 percent of projects, and sets a time with the customer to visit and verify the make and model and that the units are installed and operating in Xcel Energy's service territory.

1.2 EVALUATION METHODOLOGY

The Tetra Tech team conducted an evaluation of the Computer Efficiency program in both Colorado and Minnesota in 2016. Due to the similarities in program design and implementation, several evaluation activities were conducted jointly across both territories. The process evaluation provides Xcel Energy with a thorough understanding of customer and trade partner awareness, satisfaction, attitudes, and behaviors as well as benchmarked information for similar programs offered throughout the country. The evaluation's net-to-gross (NTG) research employed triangulation methods for best estimates of program attribution.

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

- Task 1: Kick-off meeting—in-person meeting between Tetra Tech team members and Xcel Energy staff to confirm evaluation researchable questions, activities, methods, and schedule.
- Task 2: Staff interviews—interviews with a total of five Xcel Energy staff regarding the Computer Efficiency program, including the product manager (one), portfolio manager (one), implementation contractor (one), account manager (one), and lead engineer (one).

- Task 3: Customer research—four Minnesota participant surveys[6] and 75 Colorado nonparticipant surveys.
- Task 4: Trade partner interviews—qualitative interviews with all five participating manufacturers and one influential vendor survey.
- Task 5: Net-to-gross (NTG) research—NTG recommendation for future use based on research conducted for tasks 3, 4 and 6.
- Task 6: Peer utility benchmarking—secondary research on seven other utility programs and in-depth interviews with staff at four utilities.
- Task 7: Progress reporting—biweekly status meetings to keep the evaluation on-task and engage Xcel Energy staff throughout the evaluation process.
- Task 8: Reporting—interim memo reports and discussion of results for tasks 2–6 as each task was completed, as well as draft and final reports, and a results meeting based on all evaluation research.

1.3 REPORT ORGANIZATION

Section 2 of this report synthesizes overall key findings across all of the evaluation activities. Sections 3 through 7 detail results from each of the evaluation activities as follows: staff interviews, customer research, and trade partner interviews, net-to-gross research, and peer utility benchmarking.

[6] The evaluation team also attempted to complete interviews with participating customers in Colorado, but no customers responded. Given the delivery method similarities for the downstream Computer Efficiency program across territories, Minnesota responses are presented for comparison purposes.

2. SUMMARY OF KEY FINDINGS AND RECOMMENDATIONS

The evaluation research shows that the Computer Efficiency program is generally operating well. Overall, the Computer Efficiency program evaluation found high manufacturer and participant satisfaction with both the upstream and downstream components of the program. In addition, evidence suggest the program's upstream incentives to manufacturers is having a positive impact on the proportion of 80 PLUS power supplies installed in desktops sold in Xcel Energy's Colorado territory. Manufacturers are using the program incentive to fund marketing and promotional efforts through general marketing, sales staff and reseller education, targeted website banner ads, and spiffs to sales staff for promotion of 80 PLUS power supplies.

Although there was some expectation that the upstream program component had led to market transformation and routine sales of the 80 PLUS power supplies, causing other program administrators to discontinue their incentives, estimates from EPA and Ecova research indicate that the majority of desktops sold are not ENERGY STAR® certified and sales volumes above 80 PLUS Bronze are very low. These findings suggest the market has not transformed beyond Bronze level power supplies, revealing opportunity for continued program influence in advancing the market toward more efficient power supplies.

At the same time, the program's downstream rebates for PC power management and VDI has struggled to gain traction, with low participation to date. While customers appreciate account manager outreach regarding programs, Xcel Energy recognized identification of IT contacts as one of the leading challenges for the downstream rebate program component. Evaluation activities with nonparticipants and vendors uncovered low awareness, corresponding with low participation rates. However, PC power management software vendors are actively searching out rebate programs to help market their software, which is leading to increased interest in the product.

Specific key findings and recommendations from the evaluation are discussed below.

2.1 NET-TO-GROSS

The NTG research found qualitative evidence to support current planning assumptions for upstream measures; however, a limited number of customer self-reports suggest lower attribution for downstream measures.

Participating manufacturers report using upstream program incentives for marketing and outreach efforts to increase customer awareness and interest in higher efficiency level power supplies, especially for Gold and/or Platinum. Based on feedback from manufacturer interviews, the Bronze efficiency level has become a more consistent installation among participating national manufacturers. The one exception may be for regional manufacturers, as there is qualitative evidence that the Xcel Energy incentives have a larger influence on their marketing and stocking practices for Bronze level power supplies.

Incentive data also show that Gold and Platinum power supplies are not consistently offered by all manufacturers, indicating that the market has not transformed past Bronze level efficiency, even for participating manufacturers. Without consistent offering of the efficiency levels across all manufacturers, and the slippage of a proportion of incentivized units back to

Bronze from 2014 to 2015, the incentive at these higher levels appears to be making a difference and influencing business customer purchasing behaviors. While it appears that the participating manufacturers have been influenced to shift to a higher proportion of 80 PLUS power supplies, with about 63 percent of their desktops certified ENERGY STAR v6, EPA estimates that overall approximately 40 percent of desktops sold annually are ENERGY STAR v6 certified. In addition, the participating manufacturers represent about 50 percent of desktop sales in the market, with the other 50 percent made up of a large number of smaller manufacturers each contributing approximately two percent on average.

Taking effect beginning in 2017, Xcel Energy has substantially reduced per-unit gross savings estimates for qualifying power supplies, using a weighted average of desktop power supplies currently in the market as the baseline condition. The new baseline assumption assumes 62 percent of power supplies in the market are Bronze level efficiency, based on manufacturer research. While feedback from national manufacturers indicates lower program influence on future installations of Bronze level power supplies compared to higher efficiency levels, the adjustment for naturally occurring Bronze level installations with the new gross savings technical assumptions, along with evidence from regional manufacturers that the program is still influencing sales of Bronze level over lower efficiency levels, supports the current planning NTG ratio used in Colorado as a reasonable attribution estimate (when coupled with the new gross savings assumptions) to estimate net savings.

Due to limited participation and low response rates, the evaluation team was not able to conduct primary research with Colorado participants. Consequently, the downstream participant results do not support a robust quantitative point NTG estimate generalizable to future participants. However, self-report results from downstream Minnesota participants indicate high levels of free-ridership and lower attribution than current planning estimates.

Feedback from nonparticipating customers and vendors indicates low overall customer awareness of downstream rebates that could be improved over time with increased promotion and outreach. Increased downstream participation would permit more robust NTG research in the future.

> *Recommendation # 1: The evaluation team recommends using the current upstream NTG estimate of 88 percent prospectively in Colorado across all power supply efficiency levels. In addition, we also recommend the continued use of the current downstream NTG estimate of 80 percent prospectively in Colorado and until more quantitative research can be conducted with a larger number of participants.*
>
> *Recommendation #2: Continue to monitor ENERGY STAR industry data for changes in the proportion of Bronze power supply installations.*
>
> *Recommendation #3: Investigate the feasibility of engaging additional manufacturers that are not currently participating in the program. The resources needed to recruit and enroll new manufacturers should be weighed against the benefits of impacting additional sales of 80 PLUS power supplies.*
>
> *Recommendation #4: Consider implementing additional outreach methods for increasing customer awareness and influence of downstream rebates by partnering with PC power management vendors for outreach, cross-promoting PC power management with other control-based rebate marketing, and emailing or mailing bill*

inserts to commercial customers to highlight the program benefits and procedures for participating.

2.2 PROGRAM DESIGN

Manufacturers leverage upstream program incentives to fund marketing of 80 PLUS power supplies to customers.

Manufacturers feel that marketing and promoting the energy efficient power supplies is critical to increasing awareness of and interest in that aspect of the desktop. Otherwise, customers focus on other PC characteristics and do not think to specify energy efficient power supplies.

All five manufactures apply the Xcel Energy incentives to marketing and outreach efforts, which they feel have increased awareness and interest over the past several years. Program incentives are leveraged for training to educate reseller and sales staff on the benefits of energy efficient power supplies, targeted marketing activities that include regional website banner messages, and funding of spiffs paid to sales reps to promote and sell 80 PLUS power supplies in desktop units.

While the incentives fund marketing and outreach from the manufacturers, those same manufacturers feel that it is important for commercial customers to also receive the energy efficiency message from Xcel Energy. This helps to substantiate the manufacturer promotion and bring more awareness to an aspect of the desktop that is still often overlooked.

> *Recommendation #5: Continue offering upstream program incentives for 80 PLUS power supplies to support marketing and promotion of energy efficient power supplies to commercial customers. Also, consider including promotional messaging for the upstream incentive in downstream program marketing materials to supplement manufacturers' marketing efforts.*

Upstream incentive levels are acceptable to manufacturers, but Xcel Energy's downstream program offers the lowest prescriptive PC power management rebate of the programs benchmarked.

Manufacturers have no issues with the incentive amounts available for efficient power supplies and Xcel Energy offers higher incentives for each efficiency level than Otter Tail Power and Efficiency Vermont, although Xcel Energy incentive amounts will be reduced to similar levels in 2017.

Benchmarking of six other downstream PC power management rebates show that Xcel Energy offers the lowest rebate ($5 per PC) compared to other benchmarked programs, ranging from $6 to $15, with three peer utilities offering $10 per PC controlled. Vendors find rebates of $5 to $15 covers the cost of the PC power management software and enables them to offer the software for free. However, when rebates are on the low end of the scale, it requires a larger project with more controlled computers to cover the software cost, which can impact participation. Downstream participation is currently low and contributes only a small proportion of program savings.

Recommendation #6: Monitor impacts of reducing upstream incentives on manufacturer sales, marketing, training, and spiff funding.

Recommendation #7: Review PC power management incremental cost assumptions and evaluate the feasibility of increasing the downstream incentive to encourage additional participation.

2.3 PROGRAM ADMINISTRATION

Internal processes are well defined and coordination within the internal Xcel Energy team is working well.

Xcel Energy has a well-developed and coordinated DSM staffing infrastructure. Internal communications appear to be working well. Program processes and staff roles are well defined and understood, and staff generally felt that they had sufficient and appropriate resources to effectively administer the program. Staff juggle multiple responsibilities, which can be demanding; however, Xcel Energy has demonstrated a commitment to identifying and addressing staffing needs as they arise.

Recommendation #8: Maintain current internal communication processes and continue to ensure there are adequate resources to effectively administer program functions.

Account managers are a key outreach arm and a source of customer and project information, although data tracking practices are not consistent.

All four downstream Minnesota participants interviewed heard about the program from account managers and a high proportion of nonparticipants prefer to learn of program opportunities from their account managers. Xcel Energy Account Managers track customer discussions, project leads, and the location of installed and rebated equipment within their own spreadsheets. This can be a tedious but necessary activity to collect the information needed for the QA/QC process. As each account manager compiles their own spreadsheet, there is inconsistency in the data collected and tracked. Providing a basic consistent framework for the account managers to use with customers may help manage expectations in terms of project tracking and streamline the QA/QC process. This tracking information may also be useful to mine for data such as successful roles to contact, timing of contact versus decision to install, and lag time between learning of rebates and project completion.

Recommendation #9: Consider adding supplemental information to support QA/AC efforts, such as more specific IT contact information, to the program application Salesforce. Alternatively, consider developing a standardized template for account managers to use when collecting and tracking contacts, discussions, and installations for QA/QC to maintain consistency and collect needed information.

2.4 PROGRAM IMPLEMENTATION AND DELIVERY

Customer awareness of downstream rebates is very low.

All four downstream participants interviewed as part of the evaluation reported learning of the downstream rebates from account managers after making the decision to implement eligible projects. In addition, nonparticipant customer awareness of the Computer Efficiency program was low (15 percent in Colorado).

Although customer awareness of other programs is quite a bit higher than awareness of the Computer Efficiency program, many customers are aware of the need to save energy and are taking steps to do so. When asked about other energy efficiency actions their business has taken within the past two years in order to reduce energy use, nonparticipants mentioned actions such as participating in demand response programs, purchasing high efficiency equipment, and installing solar. Almost 10 percent indicated they take some action to curb use when the business is closed by manually adjusting thermostats, reviewing scheduling for occupied versus unoccupied times, and turning off lights and other equipment.

As Xcel Energy staff have experienced, it is difficult to reach the appropriate staff within organizations to increase awareness of downstream computer efficiency rebates. Utility account managers typically work with business customer facility managers for most energy efficiency projects. Computer efficiency measures require communication with different staff within the customer organization. Depending on the type of organization, it may be IT staff, sustainability staff, accounts payable, or financial management staff.

> *Recommendation #10: Increase outreach to commercial customers that targets accounts payable, Vice Presidents, CIOs, and sustainability departments. Specific methods and messaging options worth consideration include:*
>
> - *Cross-promoting the Computer Efficiency program, especially the PC power management rebates, with other controls products such as occupancy sensors, programmable thermostats, and EMS. Marketing messages could highlight the variety of rebates available from Xcel Energy for installations that help customers save energy when they close each day.*
> - *Training third-party contractors to proactively identify and promote opportunities for PC power management or VDI during commercial energy audits or assessments.*
> - *Leveraging email for direct marketing campaigns, which enables the easy transfer of information within a firm to the correct decision-maker.*
> - *Listing trade partners on the Computer Efficiency program webpage and exploring opportunities for cross-promotion. Update the list as trade partners are identified as working with PC power management or VDI opportunities.*

School districts and universities are key targets for PC power management software vendors.

IT decision-makers can be hard to reach. Software vendors have found schools most receptive to PC power management opportunities in conjunction with security software. They also market to municipalities and corporate customers. It is important to note that many schools may not qualify for the Computer Efficiency program as they do not operate on a single shift schedule throughout the year.

PC power management vendors seek out utility program rebates to offset or eliminate incremental costs to customers. Vendors of PC power management software search out utility rebates and conduct outreach to potential customers by marketing the reduced-cost or preferably free installation opportunities. One PC power management vendor has already conducted a promotional webinar for Colorado and New Mexico school districts that generated interest for a few projects. This vendor just recently became aware of the program and was the only one at the time of the evaluation that was aware Xcel Energy offered rebates.

Additionally, nonparticipant businesses were asked where they were likely to look or who they would contact for information in the future if they were considering energy efficiency upgrades. Just over 40 percent would contact a contractor or vendor.

> *Recommendation #11: Increase engagement with PC power management software vendors to help promote program offerings to Xcel Energy customers.*
>
> *Recommendation #12: Educate PC power management vendors on program eligibility requirements that may preclude schools from participating unless they operate the full year. Additionally, explore feasibility of targeting marketing campaigns to school districts and universities that operate with a more consistent, single-shift schedule.*

QA/QC protocols are critical to maintain measure persistence and customer satisfaction for PC power management measures.

Currently, the program works with a third party contractor to perform on-site verification audits with a random sample of ten percent of completed projects. Benchmarked program managers emphasized that QA/QC protocols are particularly important for the PC power management measure. Issues with PC power management software performance can cause participants to remove it, leading to dissatisfaction with the program and utility, as well as erosion of savings.

> *Recommendation #13: Continue performing QA/QC on PC power management to ensure issues are identified and resolved quickly. Protocols for checking PC power management should include running system reports and checking that a sample of individual machines are controlled.*

2.5 MARKET RESPONSE

The evaluation research suggests the Computer Efficiency program has increased sales of 80 PLUS power supplies, but laptops, tablet, and smaller form factors are beginning to erode the desktop market.

Manufacturers feel that some energy-savvy customers are beginning to request higher efficiency, but the majority of commercial customers are still not as focused on efficiency of the desktops in comparison to other system requirements and options.

Bronze may be considered the lowest ENERGY STAR® efficiency now, but manufacturers that have progressed to Gold and Platinum efficiency levels would not sell as many of the higher efficiency power supplies without the Xcel Energy incentives. Most manufacturers feel

that sales of efficient power supplies would eventually decrease if the program were not available as the incentives go directly to support marketing efforts by all manufacturers.

Although a couple of the manufacturers are selling high proportions of Gold and Platinum efficiency power supplies, sales levels have not been sustained over multiple years. Sales of Gold and Platinum level power supplies began to increase in 2013 but have reverted back a bit to the Bronze level in 2015. Manufacturers feel this is due to cost constraints for purchasing companies and higher efficiency power supplies add to the cost of the unit.

Incentive data show that Gold and Platinum power supplies are not consistently offered by all manufacturers, indicating that the market has not transformed past Bronze level efficiency, even for participating manufacturers. Without consistent offering of the efficiency levels across all manufacturers, and the slippage of a proportion of incentivized units back to Bronze from 2014 to 2015, the incentive at these higher levels appears to be making a difference and influencing business customer purchasing behavior.

However, customers are looking for smaller units, which companies are beginning to provide. These "smaller form factors"[7] are not eligible for the program incentives and may be contributing more to the decrease in incentivized units than laptops or tablets, according to manufacturers.

> *Recommendation #14: Review the savings opportunities from small form factor or mini towers.*

Satisfaction with Ecova, Xcel Energy, and the Computer Efficiency program are all high.

Upstream manufacturer satisfaction with Ecova is high. Manufacturers are getting the information they need from Ecova and feel they have been very responsive to all requests.

Customer satisfaction with Xcel Energy is high. Overall participant satisfaction with Xcel Energy was 8.3 while nonparticipant satisfaction with Xcel Energy was 7.7. Participant customer satisfaction with the Computer Efficiency Program is also high. Survey responses indicate that participants are happy with all aspects of the program. Mean ratings varied from a 9.7 mean rating for contractor quality to 7.3 for the amount of energy savings since the project was completed.[8] Two of the four participants said their experiences with the program have increased their satisfaction with Xcel Energy overall.

> *Recommendation #15: Maintain high satisfaction rates through clear and consistent communication with Ecova, manufacturers, account managers, and customers.*

[7] In computing, the form factor is the specification of a motherboard –which generally dictates the overall size of the case.

[8] On a 0-10 scale with 0 being very dissatisfied and 10 being very satisfied.

3. PROGRAM STAFF INTERVIEWS

This section provides high-level findings from internal staff interviews.

3.1 INTRODUCTION

The evaluation team interviewed a total of five staff regarding the Computer Efficiency program, including the product manager (one), portfolio manager (one), implementation contractor (one), account manager (one), and lead engineer (one).

Staff interviews were conducted over a four-week period in April and May of 2016. The interviews covered a variety of issues, including:

- Roles and responsibilities of the staff
- Communication and interaction with others in the program
- Program design and resources to support the program
- Program marketing efforts
- Program operations
- Areas where the programs are working well and opportunities for improvements
- Past, current, and future challenges for the program(s)
- Key researchable questions for the evaluation.

The interviews provided a considerable amount of rich and detailed information that helped to shape program evaluation activities.

3.2 KEY FINDINGS

Next, we summarize the key findings from the internal review and interviews with program staff, followed by key researchable questions identified for the evaluation.

3.2.1 DSM infrastructure

Xcel Energy has a well-developed and coordinated DSM staffing infrastructure. This staffing structure has been key to the success of its DSM programs by facilitating both customer and trade partner outreach and engagement. Staff juggle multiple responsibilities, which can be demanding; however, Xcel Energy has demonstrated a commitment to identifying and addressing staffing needs as they arise. Recent examples include the re-organization of the Business Solutions Center (BSC) and the creation of the team lead position a few years ago.

Xcel Energy identified several key internal staff that support Xcel Energy's DSM programs for the internal interviews—including product managers, product developers, team leads, marketing assistants, energy efficiency engineers (EEEs), channel managers, account managers, and BSC energy efficiency specialists. While most DSM functions are performed

internally, Xcel Energy also contracts with third-party implementation firms to perform specific functions for select programs.

Product managers oversee each program and are responsible for their program's design and goals, monitoring goals, developing contingency plans, and pursuing effective marketing and communication strategies. For the business program portfolio, marketing assistants support product managers and interact with energy efficiency engineers, account managers and the BSC, trade partners and customers during the project preapproval and approval processes.

Team leads are designated for each program group in order to specifically focus on strategies for a particular program type and monitor their performance. Team leads work with the product managers and then directly report to the marketing managers. Marketing managers report to a director on strategy and policy directions for the DSM programs.

Energy efficiency engineers are responsible for technical reviews, preapprovals of custom measures, and program energy savings calculations. Account Managers are the first point of contact for managed accounts as well as a conduit between managed customers and the marketing and program teams. Rebate processors complete program documentation to ensure the customer receives their rebate.

In 2010, Xcel Energy reorganized their BSC to include energy-efficiency specialists, whose main focus is to promote energy-efficiency programs to non-managed customers. 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 assist customers and trade partners 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.

Channel managers oversee the relationships between the DSM programs and trade partners or vendors. Channel managers identify and train new trade partners as well as work with established vendors and distributors to market Xcel Energy's DSM programs. For the business program portfolio, channel managers also engage trade partners in Advisory Councils that meet periodically to provide advice and input on Xcel Energy's DSM programs.

Finally, DSM regulatory affairs staff interface with the states' Public Utilities Commissions and related stakeholders to ensure that the programs are in compliance with the regulatory framework.

Xcel Energy has established tracking systems that assist in tracking and monitoring of the programs. In 2012, the DSM program tracking system was transitioned to Salesforce to provide increased functionality for DSM staff to manage and implement the programs. All program activity is entered into Salesforce as soon as leads are identified through to when the rebate check is sent to the customer and the project is closed.

3.2.2 Program design and operations

Xcel Energy's Computer Efficiency program in Colorado provides upstream manufacturer incentives and downstream prescriptive rebates. The upstream component offers incentives to manufacturers that design, install, and deliver desktop personal computers (PCs) with high-

efficiency power supplies. The downstream component provides rebates to business customers who implement a Virtual Desktop Infrastructure (VDI) strategy or install PC Power Management software.

The upstream component of the program accounts for the majority of program savings. Currently, the downstream measures contribute only a small proportion of the overall program savings. Due to the increase in efficiency over the past several years, and shifts from PC sales to laptops and tablets, Colorado program savings have steadily declined over the past few years.

A. Upstream component

The ENERGY STAR® program for certified energy efficient power supplies, 80 PLUS® was announced in 2004 and launched in 2005. Xcel Energy has worked closely with ENERGY STAR® and has been a sponsor of the 80 PLUS program since 2007. HP joined the program in 2006, followed by Dell in 2007 and Lenovo in 2009. With a few manufacturers on board, 80 PLUS Bronze, Silver, and Gold desktops were introduced in 2008. Platinum desktops were introduced in 2009 and Titanium servers were introduced in 2011.

The upstream component of Xcel Energy's Computer Efficiency program incentivizes manufacturers for installing energy efficient power supplies in desktop computers sold to customers in Xcel Energy's territory. Ecova implements the upstream component of the program for Xcel Energy by working directly with regional and national computer manufacturers. They reach out to and maintain the relationship with manufacturers, track performance goals and efficiency ratings, and send invoices to Xcel Energy.

Ecova ensures that only program-qualifying sales of equipment receive incentives. The raw data output files are checked to ensure they match the sales reports that are gathered monthly from all the manufacturers, before they are entered into the database. The database contains ENERGY STAR® qualifying products and customer zip codes that can be used to check against utility zip codes to ensure that only qualifying products and customers within the utility's territory are incentivized.

Additional QA/QC is not performed for the upstream component of the program and installation rates are assumed to be 100 percent for a number of reasons, 1) because no customer data is collected, 2) they track that manufacturers only ship to customers in Xcel Energy service territories, and 3) the value of the new equipment/technology deteriorates so quickly that customers tend not to stockpile equipment.

B. Downstream component

The program began with the upstream component, but in 2011, the product development group added thin clients and in 2013, PC power management was added. Xcel Energy business customers are currently eligible for a prescriptive rebate of $60 per "thin client" or "zero client" installed in lieu of a desktop PC.

Xcel Energy defines Virtual Desktop Infrastructure (VDI) as a desktop computing architecture that centralizes the desktop operating system and applications environment from a physical machine to create a client server computing model. The user's desktop is hosted remotely

and accessed via an access device over the network. The user no longer has a physical PC. Qualifying VDI installations may also be termed: Thin Client or Zero Client Computing.[9]

Rebates of $5 per computer are available for customers who enable PC Power Management software from their data center or other central location that manage PCs within Xcel Energy's territory. PC Power Management should give the IT Administrator easily-accessible central control over the power management settings of networked workstations. Rebates apply only to applications on desktop PCs that operate during a typical single shift operation and prevent computer users from overriding the power management settings. At this time, installations on laptops, tablets, and other hardware such as virtual desktops, printers, and monitors do not qualify for a prescriptive rebate, and PCs used in multiple shifts or not used throughout the entire year do not qualify but can be applied for through the Custom Efficiency program.

Outreach for the downstream component is handled primarily by Xcel Energy account managers and the BSC staff. While Xcel Energy account managers focus on their largest customers, the BSC targets small to mid-size commercial customers and reaches out for energy efficiency opportunities. They also walk customers through the application process.

Customers have 12 months from the invoice purchase date to apply for a downstream rebate from Xcel Energy. Applications must include a copy of the detailed invoice showing manufacturer/model number and a copy of the qualifying equipment specification sheet that shows the equipment's wattage or watts. Upon application approval, Xcel Energy issues a rebate check for receipt within six to eight weeks. Customer purchases are tracked at the account and premise level, but rebates are often awarded at the corporate level.

Xcel Energy account managers track the location of equipment within their own spreadsheets (and ultimately in SFDC opportunities). This can be a tedious activity but necessary to collect the information needed for the QA/QC process. A third party, Franklin Energy, conducts random field audits of 10 percent of projects to verify equipment installation. Xcel Energy provides the third party contractor with a guide of what to look for during the audit. The audit firm receives a list of the projects, randomly chooses 10 percent of projects, and sets a time with the customer to visit and check the make and model and that the units are installed and operating in Xcel Energy's service territory. Audits are conducted on a monthly basis and 10 percent of the units rebated/project are verified.

3.2.3 Areas working well

Interviews with program staff identified the following areas that are working well within the program:

- *Partnerships with HP, Dell, and Lenovo allow for a wide coverage of the desktop market across the US.* Working with regional manufacturers helps as well. Finding

[9] Xcel Energy defines Thin Client Computing as including a CPU, graphics coprocessor, RAM, or local storage like a hard drive, solid state drive, or simply flash memory. Xcel Energy defines Zero Client Computing as no client-side processing or management; no CPU, no memory, no operating system, no drivers, no software, and no moving parts.

local manufacturers is a bit harder because some of them are resellers of the big manufacturers.

- *The market has really responded positively with striving to hit not only the baseline mark but beyond to higher* efficiency *levels.* Endorsement by ENERGY STAR® allowed Ecova to expand their efficiency[10] levels to add additional pressure to manufacturers to offer high efficiency options that meet or exceed customer requests.
- *Account managers have had the most success with hospitals to date.* Schools have not participated as much as expected although there are a fair amount of community colleges and big corporations. There have also been property management groups, auto body shops, and banks participating in the program.
- *Program delivery roles are well defined and understood by staff.* Despite staff all being involved with different programs in the Xcel Energy portfolio, staff were able to clearly describe the Computer Efficiency program processes and their role in the program.

3.2.4 Opportunities for improvement or additional research

Program staff identified the following opportunities for improvement or additional research:

- *Identifying new opportunities for the program to influence the market.* The program model was initially very successful but has seen declining participation in recent years. One challenge is that people are going more mobile with laptops or tablets and desktop sales volume is shrinking.
- *Identifying potential new business segments for outreach.* Currently, account managers see the program as a niche for the healthcare industry. Identification of additional business sectors, such as call centers and education, as well as methods for outreach to those sectors may increase participation.
- *Reaching IT decision-makers.* One key barrier of the downstream component is reaching the correct decision-maker within the organization. This is typically not the same person the Xcel Energy account manager works with on a regular basis. Getting from the facility manager to an IT manager has been a challenge. A recent project case study improved outreach to the correct decision-makers for other companies in the service territory.
- *Standardized project tracking tools for account management.* Account managers have their own ad hoc spreadsheet to keep track of participant information. Providing a basic framework for the account managers to use with customers may help manage expectations in terms of project tracking and streamline the QA/QC process.

[10] To improve on the general 80 PLUS power supply certification, specific certifications for Bronze, Silver, Gold, and Platinum, efficiency levels were added.

3.3 KEY RESEARCHABLE QUESTIONS

The staff interviews identified a number of questions for the evaluation, as summarized in the table below.

Table 3-1. Computer Efficiency Researchable Questions Identified During Internal Review

Researchable Question	Evaluation Activity			
	Manufacturer Interviews	Customer Interviews	Peer Utility Benchmarking	NTG Research
Are there opportunities to bring on other manufacturers that could contribute to the program?			•	
What other products are out there that utilities are incenting but they are not? Smart power strips for commercial and as online offering for small businesses.			•	
What is the forecast for the PC market? What are the current standard baseline assumptions? What is the current efficiency level of power supplies?	•		•	
How are manufacturers using the upstream rebate? Is it used as a price reduction or for marketing?	•			
How does a utility become a part of the IT infrastructure purchase decision?		•		
Are current project eligibility requirements optimal?		•	•	
Are current rebate levels and program equipment/services optimally set?	•	•	•	•
What are customer and manufacturer barriers to participation?	•	•	•	
How satisfied are upstream and downstream participants with the program? How can the program improve the customer participation experience?		•		
What do upstream and downstream participants see as the largest benefits provided by the program?		•		
What can Xcel Energy learn from other utilities?			•	
DOWNSTREAM: What level of influence does the program have on customers' decision to install program equipment? What is the extent of free-ridership for downstream projects?		•		•

Researchable Question	Evaluation Activity			
	Manufacturer Interviews	Customer Interviews	Peer Utility Benchmarking	NTG Research
UPSTREAM: What impact has the program had on participating manufacturers' installations of program qualifying power supplies?	•			•
Is the program influencing customers to implement energy-saving behavioral changes beyond the savings that can be claimed by Xcel Energy?		•		•
DOWNSTREAM: Is the program influencing customers to implement additional energy-saving computing equipment?		•		•
UPSTREAM: Is the program influencing nonparticipating manufacturers' installations of efficient power supplies in Xcel Energy's territory?	•			•
Is the current level of review for quality control appropriate? Are there opportunities to streamline certain inputs, measures, or projects?			•	
How do the program's staffing structure and roles compare with other utilities'?			•	
UPSTREAM: What impact have utility programs had on efficiency level trends in the computing marketplace? What impact has Xcel Energy's program had specifically on manufacturer practices?	•		•	•

4. PARTICIPANT AND NONPARTICIPANT CUSTOMER RESEARCH

This section presents the process results from four downstream participant customer interviews and 145 nonparticipant customer surveys conducted as part of the evaluations of Xcel Energy's Colorado Computer Efficiency program.

4.1 INTRODUCTION

As part of the evaluation of the Colorado Computer Efficiency program, the Tetra Tech team conducted phone interviews with participating and eligible nonparticipating business customers. Below we provide background of each survey effort, followed by key findings and detailed results.

4.1.1 Participant customer survey

Participant interviews were conducted over an eight week period in August and September 2016. The Computer Efficiency participant interviews followed a structured interview guide but were conducted by senior evaluation team members in order to follow up on individual responses.

The Tetra Tech team received 2012 to 2016 participant project tracking data for the Colorado Computer Efficiency program from Xcel Energy on May 23, 2016.[11] The evaluation team received a separate file containing participant contact information and firmographic information on June 2, 2016.[12] These files were merged by matching on account number and premise ID. To minimize recall issues, only participants from 2015 and 2016 were initially sampled for the evaluation.

Both Colorado and Minnesota Computer Efficiency participant data files included customers with multiple projects. For these multiple participants, the Tetra Tech team received feedback from Xcel Energy regarding the most appropriate person to contact as part of the evaluation effort.

Initially, there was only one Colorado 2015 participant eligible to interview. However, two additional projects were completed during the evaluation timeframe. In addition, due to such a small sample size in Colorado, a 2014 project was also sampled and called. The 2015 participant and one of the 2016 participants declined to speak with us and the other two were unreachable after six attempts.

Table 4-1. Colorado Participant Customer Survey Sample

Measure Category	Number of Premises in Population[13]	Population Savings (kWh)	Sample Size	Number of Completed Surveys
Colorado VDI	4	304,600	4	0
Colorado Power Management	0	0	0	0
Overall	4	304,600	4	0

Table 4-2 summarizes the Minnesota participant in-depth interview sample. The sample frame consisted of a total of 72 premises among 11 unique customers. The evaluation attempted to

[11] Filenames: MN - Computer Efficiency.csv and CO – Computer Efficiency.csv.
[12] Filenames: MN - Computer Efficiency Participants.csv and CO – Computer Efficiency Participants.csv.
[13] The population includes all participants from 2014, 2015 and early 2016.

contact all 11 customers for interviews, resulting in four completed interviews. Two participants declined to speak with us and another five were unreachable after six attempts.

Table 4-2. Minnesota Participant Customer Survey Sample

Measure Category	Number of Premises in Population[14]	Population Savings (kWh)	Sample Size[15]	Number of Completed Surveys
Minnesota VDI[16]	37	543,636	11	4
Minnesota Power Management[17]	35	1,477,882	4	2
Overall	72	3,954,347	12	4

The participant survey included questions about program awareness and communications, satisfaction with various aspects of participation, customers' energy efficiency and support needs, decision-making processes, and customer demographics. Interviews were conducted over a six week period in August and September 2016 by Tetra Tech consulting staff.

4.1.2 Nonparticipant customer survey

The evaluation team conducted a general population survey of Colorado business customers who have not participated in the Computer Efficiency program in the past five years. Xcel Energy provided eligible nonparticipant customer data to the Tetra Tech team on July 1, 2016.[18]

The evaluation team first combined all program-specific nonparticipant files provided by Xcel Energy to remove duplicate account numbers, premise IDs, and phone numbers to ensure businesses were only contacted once for the nonparticipant survey effort.

The Tetra Tech team selected a stratified random sample of nonparticipant business accounts sufficient to complete 70 nonparticipant surveys Colorado. In Colorado, the nonparticipant sample was stratified by customer size, with approximately half of the sample comprised of small business customers eligible for Small Business Lighting (<400 kW peak demand) and half of the sample comprised of customers with >=400 kW peak demand.

The table below shows the number of premises in the nonparticipant sample frame and the number of completed surveys.

Table 4-3. Colorado Nonresidential Nonparticipant General Population Survey Sample

Stratification	Number of Premises in Population	Target Completed Surveys	Actual Completed Surveys
Colorado Nonparticipants	64,112	70	75

[14] The population includes all participant premises from 2015 and early 2016.
[15] Sample size counts are estimates of the number of customers that will be called once multiple and corporate cases are identified. One case was removed from Computer Efficiency sample and contacted only about Efficiency Controls participation.
[16] One customer accounted for 22 of the 37 VDI cases.
[17] One customer accounted for 32 of the 35 PC Power Management cases.
[18] Filenames: MN Business Non Participants.csv and MN Business Non Participants.csv.

The nonparticipant survey included questions about program awareness and communications, likelihood for future participation, customers' energy efficiency and support needs, decision-making processes, and customer demographics. Interviews were conducted over a four week period in July and August 2016 through Tetra Tech's in-house computer-assisted telephone interview (CATI) lab.

4.2 KEY FINDINGS

Below are key process findings from participant and nonparticipant customer surveys in the following topic areas: program implementation and delivery, and market response.

4.2.1 Program implementation and delivery

- *Awareness of the Computer Efficiency program is higher in Colorado.* Computer Efficiency program awareness is lowest among business customers in Minnesota only. Fifteen percent of Colorado nonparticipants reported being aware of the Computer Efficiency program.
- *Account managers are a valued source of information, but they are often not reaching customers before the project plans are in process.* All four downstream Minnesota participants interviewed heard about the program after they had already planned their projects. In addition, 10 percent of all nonparticipants reported having implemented projects eligible through the program without receiving a program incentive.
- *E-mail and account managers are the preferred method of communication to learn about programs offered by Xcel Energy.* Survey respondents favored communications by email and account managers over other methods. Both participants and nonparticipants also thought that direct mailings, including bill inserts, may assist in getting the message out to more companies. A few business customers also suggested that more specific information on program eligibility and rebates are needed to peak their interest.

4.2.2 Market response

- *There is much higher awareness of, and interest in, other Xcel Energy programs than there is for the Computer Efficiency program.* Nonparticipant awareness of other Xcel Energy business programs, such as Lighting, Efficiency Controls, and Audits is considerably higher than Computer Efficiency (ranging from 14 to 44 percent compared to 9 percent for Computer Efficiency overall across both territories). Further, nonparticipant implementation or interest in virtual desktop computers or PC power management is low (15 percent), but the majority of businesses (80 percent) have implemented or are considering energy efficient lighting and over one-third have implemented or considered controls or audits. Lower awareness of and an interest in Computer Efficiency offerings may be due in part to smaller target market and/or the differences in the decision-making chain for IT related projects compared to other facility improvements.
- *Participant customer satisfaction with the Computer Efficiency Program is high.* Survey responses indicate that participants are happy with all aspect of the program. Mean ratings varied from a 9.7[19] mean rating for contractor quality to 7.3 for the amount of energy savings since project completed. Two of the four participants said their experiences with the program have increased their satisfaction with Xcel Energy overall.

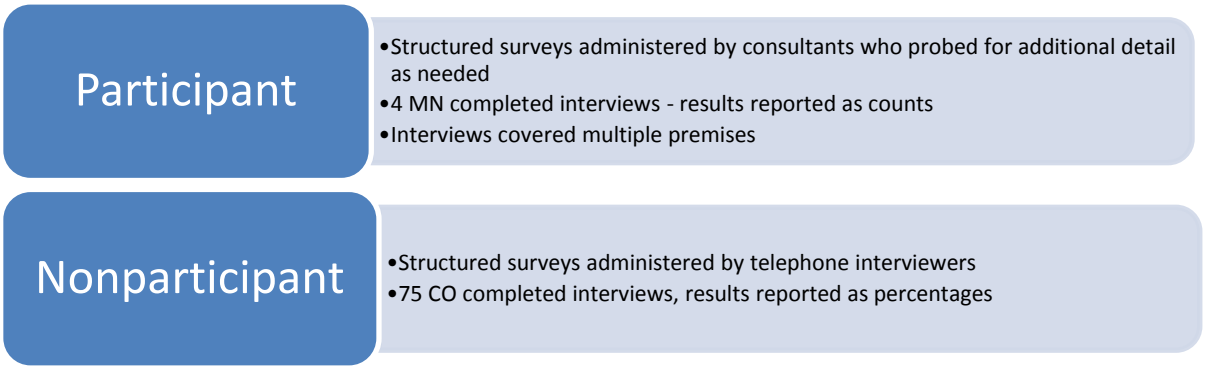
[19] Rating on a 0 to 10 scale, where 0 is "very dissatisfied" and 10 is "very satisfied".

- *Customer satisfaction with Xcel Energy is high*. Overall participant satisfaction with Xcel Energy was 8.3 while nonparticipant satisfaction with Xcel Energy was 7.7.
- *Nonparticipants rated performance concerns and capital investment availability as being the most important factors when considering energy efficiency projects.* Nonparticipants who have already purchased thin clients or PC power management felt that budget availability, equipment compatibility, and operating costs were three of the most important considerations, while those still contemplating Computer Efficiency projects were heavily considering operating costs and performance.

4.3 DETAILED RESULTS

To facilitate comparisons between participating and nonparticipating customers, survey results from each activity are presented together in the following sections where applicable. The figure below outlines a few considerations to keep in mind while reviewing the detailed results:

Figure 4-1. Participant and Nonparticipant Survey Considerations



4.3.1 Installation verification

Participants were first asked to verify whether they had installed and continued to operate the measures installed through the Computer Efficiency Program. The four individual Minnesota customer respondents accounted for 60 projects. All respondents indicated that the equipment or software is still installed and operating.

4.3.2 Program awareness

Computer Efficiency program awareness results from both Minnesota and Colorado customer surveys are presented in this section to provide a more robust view of customer awareness across both territories. All four participant respondents heard about the Computer Efficiency program rebate from their account manager. Two respondents prefer email communication and while another prefers in-person meetings. Another participant mentioned that attending events and reading case studies were good sources of information.

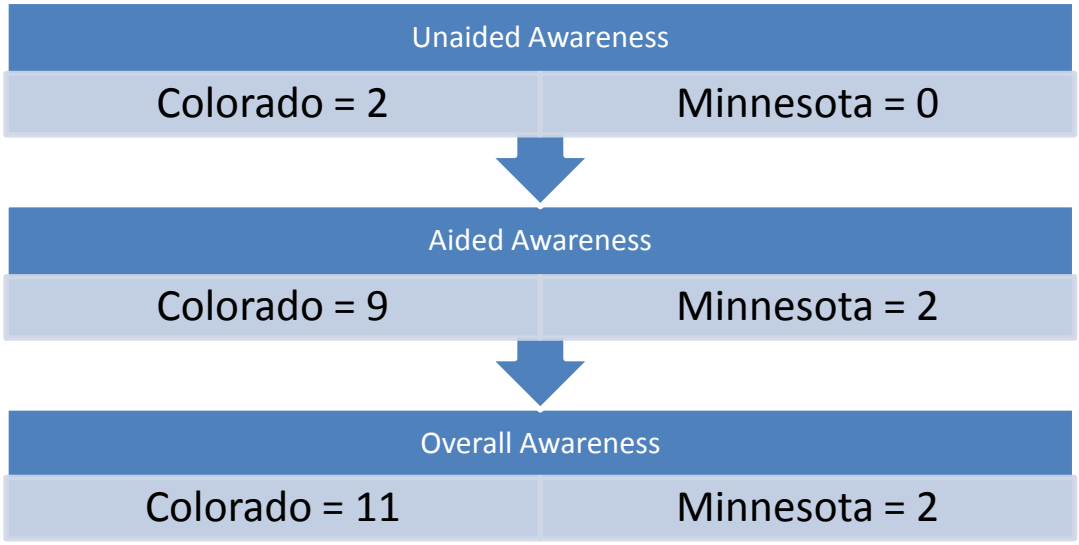
> *"There was some conversations while he (AM) was working at one of our sites. He caught wind of what we were doing, then came and talked to me about it."*

> *"We have sustainability meetings where we look for initiatives and how to save money with rebates. Electric, gas, water. Our account manager sits in on those meetings every so often*

and we let them know what we are doing, then [Xcel Energy] lets us know what rebates are available."

Overall, 70 percent of nonparticipating customers are aware that Xcel Energy offers energy efficiency programs and rebates. Those who were aware were asked to name which programs they had heard of (unaided awareness). Two nonparticipating Colorado businesses mentioned the Computer Efficiency rebates. When the Computer Efficiency program was described to nonparticipating customers (aided awareness), less than 8 percent (n=11) said they had heard of the program. Nine were from Colorado and the other two were from Minnesota.

Figure 4-2. Nonparticipant Awareness of the Computer Efficiency Program



Even with the combined overall unaided and aided awareness of the Computer Efficiency at nine percent, awareness is considerably lower than several other downstream programs. Unaided awareness of the Lighting Efficiency program was reported at 54 percent and the Efficiency Controls program was reported at 23 percent.

Similar to participants, most of the nonparticipant respondents heard about the Computer Efficiency program from an account manager (nine of 13[20]). Other sources of information about the program were from a vendor or contractor (n=2), an Xcel Energy event (n=2), and mass ad campaigns (n=2 TV). Other sources cited by individual nonparticipants included previous program experience, expos, lunch and learn meetings, and general Xcel Energy mail, email, website, and non-BSC staff.

Most nonparticipants who were aware of the Computer Efficiency program (11 of 13[21]) thought the program information source provided them with the necessary information if they wanted to participate. Just two would have liked to receive more detail on what the program had to offer:

"I guess more specifics about what they cover, how long the rebate period is, whether measurement and verification is required."

[20] Due to the low counts, nonparticipant program awareness information is reported combined across both territories.
[21] Combined Colorado and Minnesota nonparticipant responses.

"I would have liked to receive a booklet or email spelling out details."

Participants and nonparticipants agree that they would prefer to hear about the program from their account managers or other Xcel Energy staff. However, both types of customers mentioned they would like to receive more communications in the form of emails (two of four participants, six of 13 nonparticipants). Both participants and nonparticipants also thought that direct mailing, including bill inserts, may assist in getting the message out to more companies. Timing of the message is the most critical aspect, as all four of the participants reported hearing of the program after they had already planned their projects.

> *"I didn't know the program existed until after we were committed to the project. This was an after-thought and icing on the cake. They could get a lot more businesses involved if they made a little bit more awareness out there to the public. Go to supply chain, accounts payable, those are the most likely people. Or right to the VP or president. When they start hearing free money and rebates, they get excited." (Minnesota Participant)*

Nonparticipant businesses in Colorado were asked where they were likely to look or who they would contact for information in the future if they were considering energy efficiency upgrades. Over 40 percent would contact a contractor or vendor. Xcel Energy staff (account managers, BSC, and other staff) and the Xcel Energy website were also frequently mentioned as sources of information.

Table 4-4. Where Customers Would Look for Energy Efficiency Program Information

Source	Percent of Respondents
Contractor/vendor	41%
Xcel Energy account manager	31%
Xcel Energy website	17%
Other Xcel Energy program staff	13%
Xcel Energy Business Solutions Center representative	10%
Other	11%
General Internet search (e.g., Google search)	13%
Internal management staff	10%
Internal facilities management staff	7%
Respondents (n)	**70**

4.3.3 Decision-making factors

Participating customers cited very specific reasons for implementing the projects that were rebated through the Computer Efficiency program. For thin client projects, initial cost, energy savings, and increased data security were reasons for installing the projects. The PC power management allowed for energy savings as well as increased flexibility in managing devices.

All four of the participants learned of the program from account managers after their project was already planned. In one case, although the initial project was scoped before they knew of the program, additional projects were completed due to the rebate. All four participants rated the

influence of the rebate as a five or less[22] on their decision to implement the energy efficiency project. Other program factors such as program materials, Xcel Energy staff recommendations, and previous program experience were less important to most of the participants than the anticipated payback prior to the program rebate and the standard practices of the company regarding energy efficient equipment. Two participants did report that the vendors they worked with were influential in the decision about what to install.

Two of the participating companies are planning additional thin client installations, and one of these respondents said their company plans to apply for rebates from Xcel Energy for these additional installations. The other will be acquiring devices from another location that has shut down.

Of the four Minnesota participants interviewed, two companies currently have no corporate policy regarding energy efficiency when purchasing equipment or planning improvements, one has a formal policy, and one has an informal policy. Both the formal and informal policies specify the purchase of energy efficient equipment if it meets payback or return on investment criteria.

Twenty-seven percent of Colorado nonparticipants have a corporate policy regarding energy efficient purchases and improvement. Similar to the participants, among those with a corporate policy, most (67 percent) said the corporate policy encourages the purchase of energy efficient equipment if it meets payback or ROI criteria. Another 17 percent of respondents reported they purchase standard efficiency equipment that meets code. Payback criteria for nonparticipating companies varies widely, although the most common response was three to five years.

Figure 4-3. Nonparticipant Company Payback Criteria Ranges

Nonparticipants were also asked to rate the importance of several factors to their business when considering new equipment.[23] Performance concerns and capital investment availability have the highest mean ratings of importance. A recommendation by a contractor or supplier is the least important factor for nonparticipants. Nonparticipants that have already purchased thin clients or PC power management felt that budget availability, equipment compatibility, and operating costs were three of the most important considerations, while those still contemplating projects were heavily considering operating costs and performance.

Table 4-5. Mean Scores for Importance of Factors When Purchasing New Equipment

	Nonparticipants	Program-Eligible Equipment	
		Purchased	Considered
Performance concerns	9.0	8.7	**8.4**
Capital investment or budget availability	8.9	**9.1**	8.2
Compatibility with existing equipment	8.9	**8.9**	7.4

[22] Using a 0-to-10 scale where 0 means “not at all important” and 10 means “very important.”
[23] Scale of 0-10 with 0 being “not at all important” and 10 being “very important.”

	Nonparticipants	Program-Eligible Equipment	
		Purchased	Considered
Energy savings or reducing your energy bills	8.7	8.4	8.2
Initial purchase cost	8.6	8.3	7.8
Operating cost	8.5	**8.8**	**8.8**
Length of payback period	8.2	8.4	8.0
Efficiency level of new equipment	8.4	8.6	8.2
Environmental concerns	7.9	7.9	7.6
Availability of a rebate	7.5	8.0	7.8
Recommendation of contractor or supplier	6.3	6.6	5.0
Respondents (n)	**75**	**14**	**5**

The most commonly mentioned barrier to implementing energy efficiency projects for nonparticipants is lack of capital budget, mentioned by 56 percent. Another 10 percent each mentioned uncertainty regarding return on investment or have to consider production or service interruptions when implementing projects. More of the barriers listed under “other”, which were mentioned by less than five percent of nonparticipants, included equipment compatibility, the age or rental of the building, and lifecycle costs of the project.

Table 4-6. Nonparticipant Barriers to Implementing Energy Efficiency Projects

	Percent of Respondents
Need to incorporate purchases or plans into longer term budget	0%
Lack of capital budget	56%
Time constraints of internal staff to implement	3%
Lack of resources to implement	10%
Approval by decision-makers	6%
Uncertainty regarding return on investment	7%
Lack of awareness of or knowledge about energy and money saving opportunities	1%
Lack of awareness/knowledge about equipment characteristics or performance	3%
Lack of knowledge about how to obtain assistance from Xcel Energy	0%
Other	47%
Respondents (n)	**72**

4.3.4 Program experience

The mean program satisfaction rating from participants was 9.0. Three of the four participants rated all program aspects very highly, while one participant generally provided lower ratings across all aspects. Participants felt that because of their participation in the program, they benefited from electrical savings, increased data security, more "up-time" in production, and better control over their machines.

> *"Xcel (Energy) made it an easy process and did a fair amount of the work after educating us about the rebates available."*

Nonparticipants are also satisfied with their experiences with Xcel Energy, but ratings are slightly lower than ratings from participants for similar aspects.

Table 4-7. Level of Satisfaction with Program Aspects and Xcel Energy Overall[24]

		Participant[25]	Nonparticipant[26]
		N=4	N=75
Overall satisfaction with Xcel Energy as your provider	Mean	8.3	7.7
	N	3	75
The contractor who installed or implemented the project	Mean	9.7	NA
Requirements for project rebate eligibility	Mean	8.8	7.1
	N	4	46
The program's handling of your questions or concerns	Mean	8.5	NA
The amount of the rebates offered for equipment/improvements	Mean	8.5	7.2
	N	4	47
The amount of time it took to receive the rebate	Mean	8.3	NA
The program application process	Mean	8.3	NA
The clarity of program terms and conditions	Mean	7.8	NA
The type of rebated equipment or improvements available through Xcel Energy´s programs	Mean	7.6	7.6
	N	4	51
The amount of energy savings you've seen since the project completed	Mean	7.3	NA
The information you have received from Xcel Energy about their programs	Mean	NA	7.0
	N		53
The level of technical support and information available to you, including technical assessments	Mean	NA	6.5
	N		50

[24] Using a 0-to-10 scale where 0 means "very dissatisfied" and 10 means "very satisfied."
[25] Source: Participant Questions SA6_a to SA6_i and SA7.
[26] Source: Nonparticipant Questions SA1a to SA1e and SA3, response counts vary from 81 to 144 overall.

Two participants filled out the application themselves and two others had applications completed by the company's sustainability department. One respondent did not need any assistance from Xcel Energy and two others knew they had received assistance from an Xcel Energy account manager and/or vendors. The type of assistance received included help filling out forms, clarifying savings calculations, and supplying itemized invoices.

While two participants felt they had experienced no issues participating, one struggled slightly with the timing of submitting the application because of their internal accounting practices. The final respondent commented that they went through extensive pre-planning for the project to ensure their hardware had the capability to work with the software.

4.3.5 Nonparticipant energy efficiency actions

Nonparticipants were asked if they had implemented or considered implementing various types of projects in the past two years. The most commonly mentioned improvements were energy efficient lighting and automated controls systems. Over 15 percent of respondents reported implementing or were considering virtual desktop computers or PC power management.

Table 4-8. Nonparticipant Project Implementation or Consideration in the Past Two Years

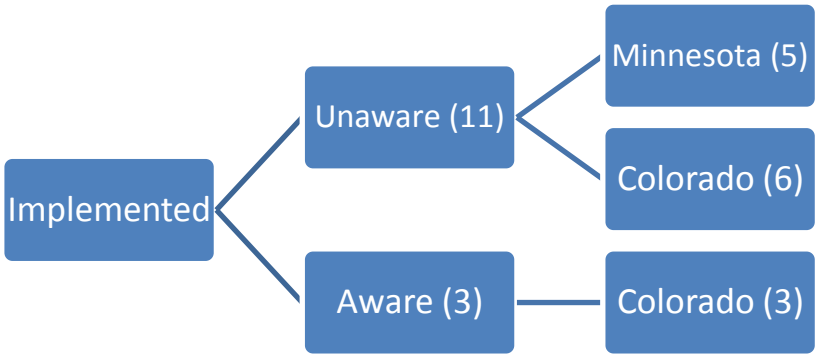
Energy Efficient Improvement		Percent of Respondents
Automated control system that controls equipment such as HVAC and/or lighting (e.g., EMS, BAS)	Have implemented within the past two years	39.2%
	Have considered but not yet implemented	9.5%
	No	51.4%
	Respondents (n)	**74**
Energy efficient lighting	Have implemented within the past two years	60.0%
	Have considered but not yet implemented	18.7%
	No	21.3%
	Respondents (n)	**75**
Virtual desktop computers or PC power management software	Have implemented within the past two years	12.5%
	Have considered but not yet implemented	2.8%
	No	84.7%
	Respondents (n)	**72**
Having an energy audit or assessment conducted	Have implemented within the past two years	27.8%
	Have considered but not yet implemented	13.9%
	No	58.3%
	Respondents (n)	**72**

To better inform downstream program awareness we summarize responses from both Colorado and Minnesota nonparticipants. Fourteen nonparticipants reported that their company had previously installed thin client technology or PC power management software solutions. Another five nonparticipant companies considered either thin client technology or PC power management software, but have not moved forward with projects yet. Five of the fourteen companies installing

thin clients have a corporate policy for purchasing new equipment. Of the five still considering a thin client or PC power management projects, only one of them has a corporate policy for purchasing new equipment.

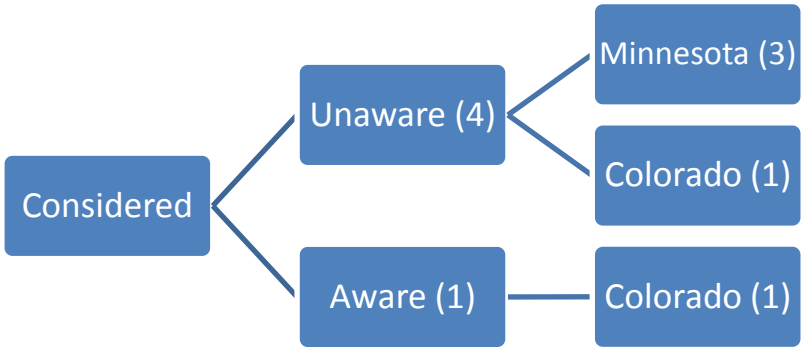
Customer location and awareness of the Computer Efficiency program are shown in the figure below for the 14 nonparticipants reporting they had implemented projects that would have been eligible for Computer Efficiency rebates.

Figure 4-4. Attributes of Customers Implementing Computer Efficiency Type Projects



Customer awareness and location are shown in Figure 4-5 for the five nonparticipants reporting they are considering implementing projects that would have been eligible for Computer Efficiency rebates. Similar to those nonparticipants who have already implemented, the one customer aware of the program is located in Colorado.

Figure 4-5. Attributes of Customers Considering Computer Efficiency Type Projects.



When asked about 'other' energy efficiency actions their business has taken within the past two years in order to reduce energy use, nonparticipants mentioned actions such as participating in demand response programs, purchasing high efficiency equipment, and installing solar. However, almost 10 percent indicated they take some action to curb use when the business is closed by manually adjusting thermostats, reviewing scheduling for occupied versus unoccupied times, and turning off lights and other equipment.

> *"Education, adjusted the temperature settings, pay closer attention to the occupied/unoccupied scheduling."*

> *"We manually set back thermostats nightly. Lights are turned off when we are closed for the day."*

4.3.6 Net-promoter score

Three of the four participants interviewed rated the likelihood of recommending Xcel Energy to a friend, relative, or colleague an 8 or higher on a 0 to 10 scale, where 0 means “not at all likely” and 10 means “extremely likely” (ratings of 8, 10, and 10, respectively). One participant provided a rating of 5 with the reasoning that there is no other choice in the area.

Over half of nonparticipant respondents also rated the likelihood of recommending Xcel Energy an 8 or higher on the same scale. Half of respondents who rated their likelihood of recommending Xcel Energy less than or equal to 5 explained they have no choice of service providers, not because of any specific issues with Xcel Energy service. The other one-half were either neutral or had individual service issues.

Table 4-9. Nonparticipant Likelihood of Recommending Xcel Energy to a Friend, Relative, or Colleague

Likelihood Rating	Percent of Respondents
1 Not at all likely	6%
2	0%
3	0%
4	4%
5	17%
6	4%
7	7%
8	24%
9	6%
10 Extremely likely	31%
Respondents (n)	**70**

4.3.7 Business characteristics

Colorado projects between 2014 and 2016 included a university, a hospital, a financial services firm, and a warehouse/distribution company. Nonparticipant survey results show a high proportion (24 percent) of office/professional businesses in Colorado, followed by Industrial/Manufacturing at 13 percent and a few business sectors just below 10 percent (Lodging, Service, Health Care, and Warehouse/Distribution Center).

Table 4-10. Nonparticipant Business Activity

	Percent of Respondents
Office/professional	24%
Data center/computer server farm	1%
Warehouse or distribution center	8%
Food sales or service	5%
Retail	7%
Education	4%
Religious worship	0%
Public assembly	4%
Health care	8%
Service	8%
Lodging	9%
Public order and safety	0%
Industrial/Manufacturing	13%
Agricultural	3%
Vacant	1%
Municipal/Governmental	1%
Other (SPECIFY)	3%
Respondents (n)	**75**

Two of the Minnesota participant survey respondents were for-profit companies and the other two were not-for-profit, although the not-for-profit businesses accounted for 79 percent of the projects. Not-for-profit businesses made up only 9 percent of the nonparticipant respondents.

Table 4-11. Nonparticipant Type of Business

	Percent of Respondents
Local, state, or federal government institution	12%
For-profit business	79%
Non-profit business	9%
Respondents (n)	**75**

Almost two-thirds of nonparticipating businesses own their locations and one-third rent. Participating customers we interviewed in Minnesota mostly owned their locations, although the health care organizations also rented a few sites.

Table 4-12. Own or Lease Location

	Nonparticipant Premise	Participants Response Notes
Own	64%	One manufacturer owns
Rent/lease	33%	One manufacturer leases
Own some and rent/lease some	1%	Both health care organizations own most but rent a few locations
Manage property	1%	
Respondents (n)	**73**	

Thirty-seven percent of the nonparticipant businesses were single locations, while all the participant businesses had multiple locations. We spoke with one Minnesota participant that had multiple locations in the region and the other three considered themselves national firms.

Table 4-13. Number of Facilities

	Nonparticipant Premise	Participants Response Notes
Only location	37%	
One of several in region	25%	1 has multiple locations in the region
One of several across the nation	37%	3 considered themselves national
Respondents (n)	**75**	

Based on number of employees, three of the four participating businesses we interviewed were very large (one with 50-99 employees, and three with over 500 employees). In contrast, 65 percent of nonparticipating businesses had fewer than 50 employees.

Table 4-14. Number of Employees

	Nonparticipant Premise	Participants Response Notes
Less than 10	46%	
10-49	19%	
50-99	7%	1 small manufacturer
100-249	10%	
250-499	7%	
500 or more	11%	3 large companies, 2 with over 20,000 employees
Respondents (n)	**72**	

5. TRADE PARTNER INTERVIEWS

This section provides summary findings from manufacturer interviews conducted as part of the evaluation of Xcel Energy's upstream Computer Efficiency program component in Colorado.

5.1 INTRODUCTION

The ENERGY STAR® program for certified energy efficient power supplies, 80 PLUS® was announced in 2004 and launched in 2005. Xcel Energy has worked closely with ENERGY STAR® and has been a sponsor of the 80 PLUS program since 2007. HP and Dell joined the program in 2007, followed by Lenovo in 2009. With a few manufacturers on board, 80 PLUS Bronze, Silver, and Gold desktops were introduced in 2008. Platinum desktops were introduced in 2009 and Titanium servers were introduced in 2011. Equus and Nor Tech joined by 2012.

The upstream component of Xcel Energy's Computer Efficiency program incentivizes manufacturers for installing energy efficient power supplies in desktop computers sold to customers in Xcel Energy's territory. Ecova implements the upstream component of the program for Xcel Energy by working directly with regional and national computer manufacturers. They reach out to and maintain the relationship with manufacturers, track performance goals and efficiency ratings, and send invoices to Xcel Energy.

Ecova ensures that only program-qualifying sales of equipment receive incentives. The raw data output files are checked to ensure they match the sales reports that are gathered monthly from all the manufacturers before they are entered into the database. The database contains ENERGY STAR® qualifying products and customer zip codes that can be used to check against utility zip codes to ensure that only qualifying products and customers within the utility's territory are incentivized.

5.2 KEY FINDINGS

Below are key findings from the trade partner interviews in the following topic areas: program design, program implementation and delivery, and market response.

5.2.1 Program design

- *All program requirements are clearly understood by the participating manufacturers.* The program is designed to follow the ENERGY STAR® and 80 PLUS program guidelines and efficiency levels. Manufacturers are well-versed in the efficiency levels and rebates available.
- *Rebate levels are acceptable.* Manufacturers have no issues with the rebate amounts available.

5.2.2 Program implementation and delivery

- *Satisfaction with Ecova is high*. Manufacturers are getting the information they need from Ecova and feel they have been very responsive to all requests.
- *Manufacturers leverage program incentives to fund marketing of high efficiency power supplies.* Program incentives are leveraged for reseller and sales staff training, targeted marketing activities, and to promote 80 PLUS power supplies.

- *Manufacturers continue working directly with customers.* Most manufacturers use a combination of internal sales staff and resellers to reach customers. Depending on the manufacturer, anywhere from 30 to 75 percent of sales are direct to customers. Only one manufacturer has transitioned completely to sales through resellers.

5.2.3 Market response

- *Customer awareness is key to requesting higher efficiency.* Manufacturers feel that some energy-savvy customers are beginning to request higher efficiency, but the majority of commercial customers are still not focused on efficiency of the desktops in comparison to other system requirements and options. However, customers are looking for smaller units, which companies are beginning to provide, but these "smaller form factors"[27] are not eligible for the program rebates and may be contributing more to the decrease in incentivized units than laptops or tablets.
- *Although a couple of the manufacturers are selling high proportions of Gold and Platinum efficiency power supplies, sales levels have not been sustained over multiple years.* Sales of Gold and Platinum level power supplies began to increase in 2013 but have reverted back a bit to the Bronze level in 2015. Manufacturers feel this is due to cost constraints for purchasing companies and higher efficiency power supplies add to the cost of the unit.
- *Bronze may be considered the lowest ENERGY STAR® efficiency now, but manufacturers that have progressed to Gold and Platinum efficiency levels would not sell as many without the Xcel Energy incentives.* Most manufacturers feel that sales of efficient power supplies would eventually decrease if the program were not available as the incentives go directly to support marketing efforts by all manufacturers.
- *Competition plays a role in efficiency levels offered.* All manufacturers have a general idea of what the others are offering and how they compare and that is taken into consideration when each determines which efficiency levels to offer and how to price.

5.3 DETAILED FINDINGS

Next, we present detailed findings from the trade partner interviews. As the interviews were semi-structured, not all interviewees were asked or answered the same questions in the exact same manner; therefore, response counts should generally not be viewed as proportions of responses, unless specifically indicated.

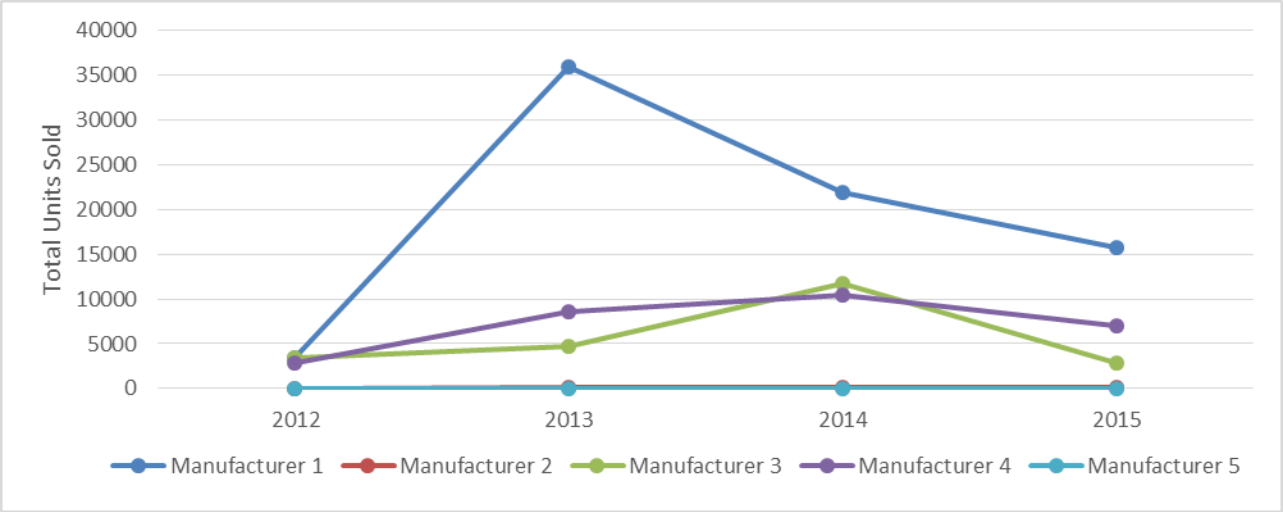
5.3.1 Manufacturer profile

There are five manufacturers currently installing high efficiency power supplies in Xcel Energy's Colorado territory: Dell, Equus, HP, Lenovo, and Nor Tech.[28] Four of the five manufacturers sell desktops nationally, while one has regional sales across MN, WI, IA, SD, and ND. Sales levels through the program vary by manufacturer are shown in Figure 5-1 below.

[27] In computing, the form factor is the specification of a motherboard, which generally dictates the overall size of the case.

[28] Manufacturer names are blinded throughout the rest of the report to maintain confidentiality.

Figure 5-1. Colorado Computer Efficiency Manufacturer Overall Sales by Year



In Colorado, Manufacturer 1 has been the most active, with Manufacturer 3 and Manufacturer 4 also contributing between 5,000 and 10,000 units per year. Manufacturer 2 and Manufacturer 5 receive incentives on fewer than 100 units per year in Colorado.

Tetra Tech team members attempted and completed interviews with all five manufacturers in August 2016. Interviews were semi-structured following an interview topic guide. This topic guide served to offer consistent direction to ensure certain topics are covered; however, interviewers were permitted to tailor and modify questions as needed to fit the interviewee's experience and explore other topics of particular interest to interviewees.

The interviews focused on discussion of the following topics:

- *Program Design:* Rebate levels, equipment eligibility.
- *Program Implementation and Delivery*: Interaction with Ecova, marketing to customers, distribution chain for desktops, incentive leveraging.
- *Market Response:* PC sales trends, shifts in sales across efficiency levels, customer preference in power supplies.

5.3.2 Program design

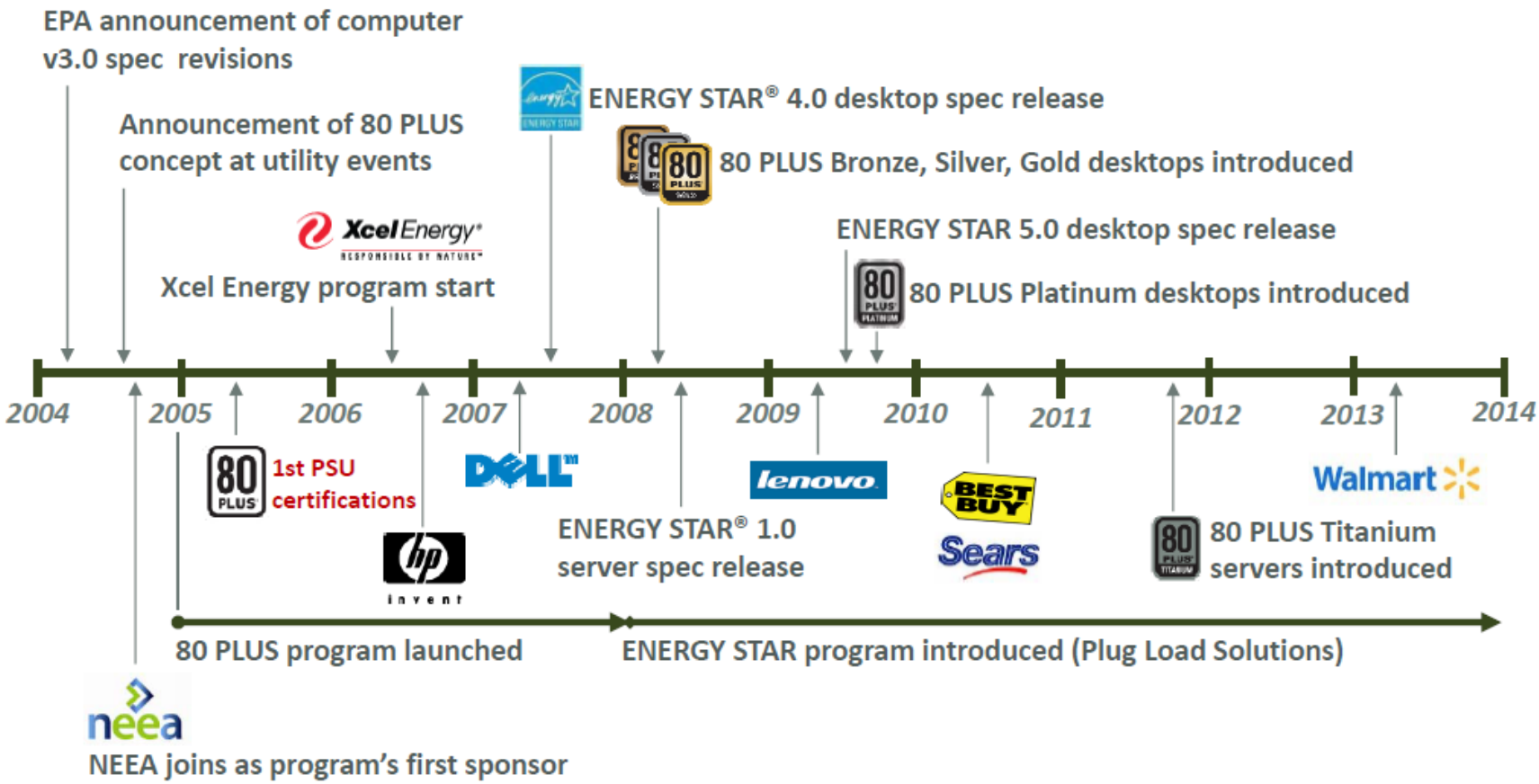
The Computer Efficiency program has been designed to follow the 80 PLUS program eligibility guidelines and efficiency levels. Rebate levels increase with each increase in efficiency level, as seen in Figure 5-2 below.

Figure 5-2. Xcel Energy Power Supply Incentive Levels

Ecova reaches out to all manufacturers directly to sign them up for the program. Most manufacturers have been involved with the 80 PLUS program and the Xcel Energy incentives from 2012 to as far back as 2007. Ecova provided information on the history of the ENERGY STAR® and 80 PLUS programs. One of those slides is included below (Figure 5-3Figure 5-3) to provide a timeline of when each stage of the program began as well as when market actors became involved.

Manufacturers all provided similar reasons for becoming involved with the Xcel Energy program – the incentives provide funding for them to communicate the benefits of 80 PLUS increase marketing of computers that are ENERGY STAR® certified.

Figure 5-3. ENERGY STAR®/80 PLUS Program History Overview[29]

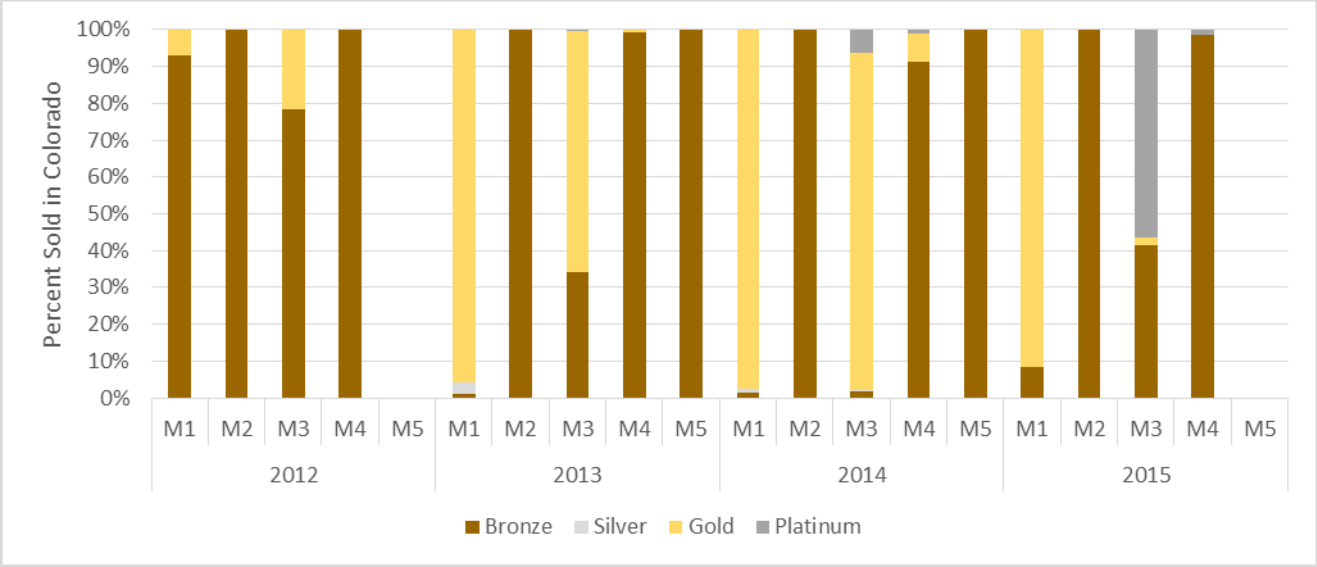


[29] Graphic provided by Ecova.

5.3.3 Efficiency Distribution and Progression

The 80 PLUS program consists of four efficiency levels – Bronze, Silver, Gold, and Platinum. In March 2008, the Bronze, Silver, and Gold efficiency levels were introduced. Platinum desktops were introduced later in October 2009. Xcel Energy incentives for each efficiency level are shown in the figures below by territory.

Figure 5-4. Distribution of Colorado Incentives Among Manufacturers by Year.



Similar to market data received from Ecova, the Computer Efficiency incentive data shows that Bronze level efficiency power supplies are still the basic installation for most manufacturers and Silver level power supplies are rarely installed. Bronze is still the most common choice for customers as it is the most economical way for them to have an ENERGY STAR® certified PC, with upgrade costs of $10 to $15 above standard efficiency.

Even Dell and HP, which have had success selling Gold and Platinum power supplies in 2013 and 2014, have increased the proportion of Bronze power supplies sold in 2015 to remain cost competitive in the current market. All manufacturers have a general idea of what the others are offering and how they compare. Every aspect is taken into consideration when determining which efficiency levels to offer and how to price units. Manufacturers understand that business customers, especially energy-savvy IT staff, will closely compare features and prices when they are looking at a high-quantity purchase.

Installations of Gold level power supplies began to increase in 2013 but started to transition over to Platinum in 2014. Heavy marketing of Platinum power supplies began in 2015 for Lenovo and HP and HP is focusing on Platinum if a customer is looking for an energy efficient solution. Dell is able to upsell Gold power supplies to corporate customers who are more aware of and receptive to the savings advantages.

While the larger volume manufacturers are marketing Gold and Platinum level power supplies, they are also consciously trying to limit the range of options for cost-effectiveness, but will provide any level power supply that a customer specifically requests.

For smaller program contributors such as Nor Tech and Equus, Bronze is the most economical choice that allows them to meet ENERGY STAR® requirements and is often what is now commonly supplied by their vendors for ready-to-ship models. Although Bronze are now common for these manufacturers, the program incentive encouraged the adoption over the course of several years.

5.3.4 Program operations

All program requirements are understood by the participating manufacturers, and all manufacturers are satisfied with their interaction with Ecova. As the program implementer, Ecova communicates well with all manufacturers and all manufacturers feel that questions are responded to promptly and professionally. All five manufacturers also find the contracting process to be easy; it is a one-time process. Each manufacturer provides monthly sales data, either by territory or overall. Ecova then filters for Xcel Energy customer eligibility and verifies eligible power supply models.

Below are a couple of specific comments from participating manufacturers on their experiences with Ecova:

> *"Ecova is very helpful with questions about models of power supplies, giving us detailed lists of all the power supplies that work with the program."*
>
> *"We have regularly scheduled meetings once a month and ad hoc meetings when needed. They are very accessible and easy to work with. Quick to answer questions and requests."*

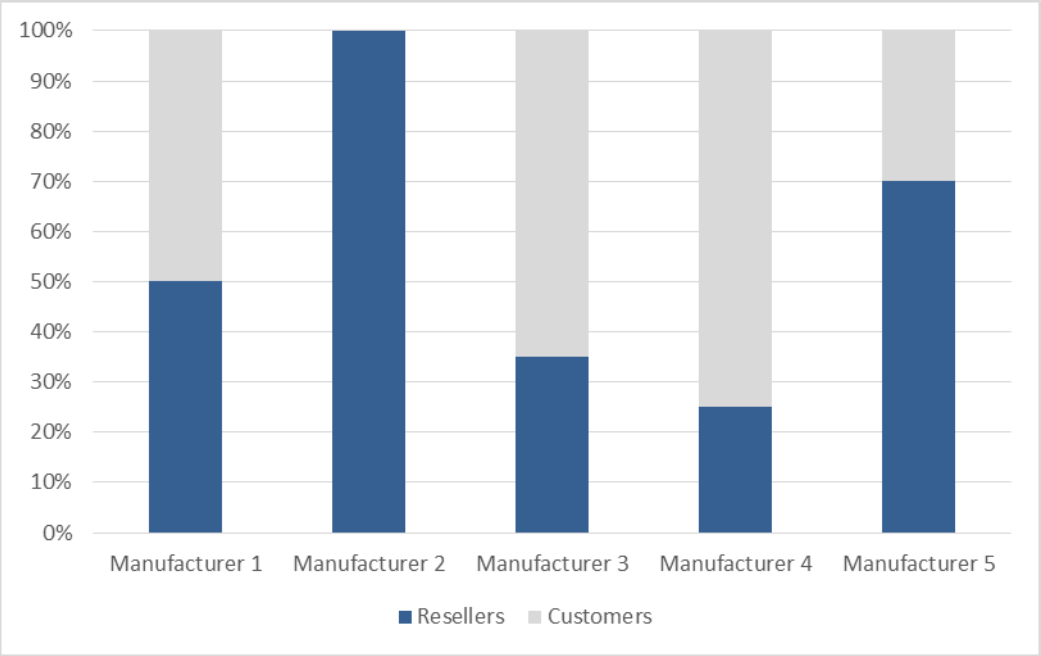
5.3.5 Program marketing

While one manufacturer now sells only through value-added resellers[30], the other four manufacturers that we talked to also sell directly to end-use customers, with direct customer sales accounting for 30 to 75 percent of overall sales (Figure 5-5).

The manufacturers that sell directly to customers are often dealing with large orders and RFQs from IT staff or procurement departments. In some cases, the customer will request pricing on energy efficient desktops or power supplies.

[30] A value-added reseller (VAR) is a company that adds features or services to an existing product, then resells it (usually to end-users) as an integrated product or complete "turn-key" solution. This practice occurs commonly in the electronics, or IT industry, where, for example, a VAR might bundle a software application with supplied hardware.

Figure 5-5. Proportion of direct sales to customers or through resellers



For most manufacturers, the process of marketing through resellers or direct sales staff is similar. Manufacturers provide training and marketing materials to both the resellers and internal sales staff regarding ENERGY STAR® certification levels, energy savings, and equipment reliability.

While marketing messages to customers focus on energy savings and equipment reliability, the specifics of the messages vary. Some examples include:

- Manufacturer 1 communicates a "Total cost of ownership" story regarding efficiency levels and what they mean to customers. Power consumption and cost savings is the key story line, especially if the customer plans to keep the computer for more than three years.
- Manufacturer 5 focuses on the quality and reliability of the 80 PLUS power supply to the end user. The message is used by the reseller to educate customers.
- Manufacturer 3 embeds the efficiency message in collateral (spec sheets) to customers and resellers. The program allows them to market the power supply, which would not happen if not for the incentive. The program allows Manufacturer 3 to highlight a part of the unit that is efficient and reasons why a customer should buy a particular skew with a particular power supply.
- Manufacturer 4 works with customers that have a higher awareness of energy efficiency (which significantly increased in past 10 year). They have internet tools to demonstrate their efficiency and trained sales staff to communicate it as well. In discussions with customers, they review the systems they use and power consumption, ROI from legacy to modern system, and different desktop profiles.

All of the manufacturers leverage the Xcel Energy incentive to train reseller and internal sales staff and enhance marketing of the high efficiency power supplies. The incentive translates into various types of marketing options for each manufacturer:

- Two manufacturers turn the incentive into spiffs to sales staff. Manufacturer 1 pays a dollar amount to sales staff depending on the power supply level and number of units sold. Manufacturer 5 allocates $5 per efficient power supply with $2 to the company and $3 to the sales staff.

- Manufacturer 1 has web banners that can be modified to display special power supply messaging that is specific to regions or zip codes. The program incentive makes this customization possible.
- Manufacturer 2 uses a portion of the program incentive funds for ENERGY STAR® certification of new systems. About every 18 to 24 months they have to recertify systems to stay eligible and the cost of recertification has increased while the incentives have decreased. They feel they are at a breakeven point currently.
- Manufacturer 3 uses part of the incentive for demonstration units to show how well the efficient power supplies work. They are also able to embed the ENERGY STAR® power supply efficiency message in collateral or specification sheets for customers and resellers.

5.3.6 Effect of incentives on the market

Most manufacturers are not tracking sales by power supply type closely enough to be able to definitively say how sales would change in the absence of the program.

Manufacturers all believe that Bronze is the least-cost option for meeting ENERGY STAR® certification. They still have small proportions of desktops that are not ENERGY STAR® certified and would not meet the Bronze level efficiency, although a few have goals to have all models ENERGY STAR® certified at some point.

Overall, manufacturers felt that without the Computer Efficiency program and incentives, customer awareness would decline and result in fewer requests or less interest in energy efficient power supplies. As a result, those currently selling the Gold and Platinum level power supplies thought they would likely install fewer Gold and Platinum and go back to installing a higher proportion of Bronze power supplies. The manufacturers with smaller volume through the program, primarily Bronze, were unsure of how the absence of a program would affect them, but also thought that over time there would be some impact to the level of power supply efficiency installed in desktops sold.

Below are some of the specifc feedback we received from each manufacturer:

Manufacturer 1 Would likely reduce quantity of higher efficiency without incentive

- Bronze is the base power supply level for business line of desktops
- Felt Gold sales may become Bronze with no incentive
- Thought the proportion of Gold PS was higher in Xcel territories than elsewhere, though no data
- Marketing is the major contributor for increasing customer awareness and request for efficient power supplies

Manufacturer 2 Would not anticipate much change

- Due to the greater reliability of 80 PLUS power supplies, requests for 400W automatically receive Bronze power supplies
- Currently only installs Bronze level power supplies

Manufacturer 3 Would likely reduce quantity of higher efficiency without incentive

- Estimated about a 5% decrease in Bronze level power supplies without the program incentive
- Estimated a 10-15% decrease in Platinum level power supplies without the program
- Credits the program for ability to provide demo machines that showcase the efficient power supplies

Manufacturer 4 Would not anticipate much change

- Primarily installing Bronze level efficiency and feels Bronze is now baseline efficiency
- Also feels that customers are installing the least-cost option that meets their needs unless they thoroughly understand the savings potential of higher efficiency power supplies

Manufacturer 5 Would anticipate a slight decline in efficiency over time

- Bronze is primary power supply level installed currently
- Feels the program incentives used for sales spiffs motivate sales staff to discuss efficiency levels
- Believes the absence of the incentives would lead to a decrease in the discussion of energy efficient power supplies and lower sales

5.3.7 Additional opportunities

Overall, the participating manufacturers all believe the program is working well and are satisfied with their relationship with Ecova. While manufacturers agree that the program is affecting the sales of 80 PLUS power supplies through the marketing efforts, they also think more could be done to raise commercial customer awareness of the benefits of efficient power supplies.

> *"The outreach to customers from Xcel is important to supplement the manufacturer message and increase awareness, there are still many types of customers that are not power supply savvy."*

Manufacturers suggested that Xcel Energy continue to market to commercial customers and potentially increase marketing to small businesses. Their opinion was that bill inserts to those paying the utility bill may be the most effective way to get the message out there. Interviewees feel that increased awareness on the part of commercial customers may translate into more requests for efficient power supplies or how to save money on energy use when customers contact them.

Two manufacturer thought it would be beneficial to get more utilities to offer these types of incentives.

All of the manufactures that were interviewed indicated that desktops are still the main product sold to corporate customers due to the flexibility, customization, and control possible. However, three of the five manufacturers indicated their portfolios have recently begun to change to smaller form factors as corporate customers attempt to reduce the space used by computing equipment. The small form factors are in response to market trends and are often a substitute for laptops that provide commercial customers with the benefits of the desktops while freeing valuable space. While one manufacturer mentioned discussing the potential for incentives for these new smaller form factor desktops, another admitted that the power demand decreases as the size decreases, so incentives may not be as necessary.

6. NET-TO-GROSS RESEARCH

This section presents the methodology and results of the net-to-gross (NTG) research conducted as part of the evaluations of Xcel Energy's Colorado Computer Efficiency program.

6.1 INTRODUCTION

NTG is one indicator of program performance that estimates a program's influence in the implementation of program-eligible measures. 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 NTG research consisted of the following primary research activities: structured interviews with recent downstream participating customers, participating upstream manufacturers, and influential vendors (trade partners identified by participating customers as being influential in their decision-making process). The evaluation team further triangulated the findings from this research with other sources of information to provide a recommendation that the team believes most accurately represents program attribution. The triangulation data sources include in-depth interviews with trade partners and other market actors, benchmarking review of NTG estimates of similar programs, nonparticipant installations of energy efficient equipment, and known program changes that may affect future attribution levels.

It is important to keep in mind that the NTG ratio should continue to be revisited and revised as program modifications are made that could have an upward or downward effect on the NTG ratio. The NTG results presented here are 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 summarized next, followed by the detailed methodology and results.

6.2 KEY FINDINGS

Table 6-1 presents the current NTG ratios used for the Colorado Computer Efficiency program.

Table 6-1. Current NTG Ratios for CO Computer Efficiency Program

Program	Delivery Channel	
	Upstream Incentives	Downstream Rebates
Colorado Computer Efficiency	88%	80%

6.2.1 Upstream incentives

The NTG ratio for the upstream component of the Colorado Computer Efficiency program is currently estimated at 88 percent. The research findings qualitatively support this NTG ratio is a reasonable estimate of program attribution to be used to calculate net savings prospectively.

Below are key findings from the upstream NTG research:

- Based on feedback from manufacturer interviews, the Bronze efficiency level has become a more consistent installation among participating national manufacturers. The one exception may be for regional manufacturers, as there is qualitative evidence that the Xcel Energy incentives are still influencing their marketing and stocking practices for Bronze level power supplies.
- Participating manufacturers report using program incentives for marketing and outreach efforts to increase customer awareness and interest in higher efficiency level power supplies, primarily Gold and/or Platinum.
- Incentive data show that Gold and Platinum power supplies are not consistently offered by all manufacturers, indicating that the market has not transformed past Bronze level efficiency, even for participating manufacturers. Without consistent offering of the efficiency levels across all manufacturers, and the slippage of a proportion of incentivized units back to Bronze from 2014 to 2015, the incentive at these higher levels appears to be making a difference and influencing business customer purchasing behavior.
- Taking effect beginning in 2017, Xcel Energy has substantially reduced per-unit gross savings estimates for qualifying power supplies, using a weighted average of desktop power supplies currently in the market as the baseline condition. The new baseline assumption assumes 62 percent of power supplies in the market are Bronze level efficiency, based on manufacturer research.

Based on these findings, the evaluation team recommends using the current Colorado upstream NTG ratio estimate of 88 percent prospectively in Colorado. While feedback from national manufacturers indicates lower program influence on future installations of Bronze level power supplies compared to higher efficiency levels, the program will already be adjusting for naturally occurring Bronze level installations in its gross savings technical assumptions starting in 2017. This change, along with evidence from regional manufacturers that the program is still influencing sales of Bronze level over lower efficiency levels on a regional-level, supports the current planning NTG ratio in Colorado as a reasonable attribution estimate (when coupled with the new gross savings assumptions) to estimate net savings.

6.2.2 Downstream rebates

The NTG ratio for the prescriptive downstream rebate component of the Computer Efficiency program is currently estimated at 80 percent in Colorado. Due to limited participation and low cooperation rates, the evaluation team was only able to conduct primary research with four unique downstream participant customers of the Minnesota Computer Efficiency program, and no Colorado participants were able to be interviewed. Consequently, the downstream participant results do not support a robust quantitative point NTG estimate. However, self-report results from downstream participants indicate high levels of free-ridership and lower attribution than current planning estimates.

Table 6-2 summarizes the number of projects covered in the downstream participant interviews and self-report approach (SRA) NTG results. Overall, the SRA NTG results were based on five measure-level interviews with four unique downstream participant customers (all in Minnesota). The evaluation team also interviewed one vendor identified by one participant customer as being influential in their decision-making process.

The self-report surveys resulted in an overall free-ridership rate of 84 percent and a NTG ratio of 16 percent for the program, though these results should only be viewed qualitatively due to the small sample size.

Table 6-2. Qualitative Minnesota Downstream Rebate SRA Net-to-Gross Results

Program	Participants Surveyed	Free-ridership (FR)	Participant Spillover (PS)	Nonparticipant Spillover (NS)	NTG Ratio (1 – FR + PS + NS)
Minnesota Computer Efficiency (Downstream Rebates)	4	84%	0%	0%	16%

Findings from participant interviews, nonparticipant surveys, and virtual desktop and PC power management vendors indicates low program awareness among customers and vendors and some nonparticipant installations of virtual desktop or PC power management in the market. These findings are consistent with the SRA results. The evaluation team believes this low awareness is leading to high free-ridership since the downstream component is only reaching participants who would have implemented the project without the program. Supporting this, feedback from PC power management vendors working in other territories suggests that increased marketing and outreach activity to vendors could increase customer awareness of the program offerings and efficiency opportunities, leading to higher program attribution.

Based on the research findings, the evaluation team recommends that the current Colorado downstream NTG ratio estimate of 80 percent be used prospectively for the downstream component in Colorado until more quantitative research can be conducted with a larger number of downstream participants. Further, the evaluation team recommends the program expand marketing and outreach efforts to PC power management vendors and customers to increase customer awareness of efficient computing options and program offerings. This increased vendor and customer outreach should enable the program to influence customer decision-making.

6.3 METHODOLOGY

This section summarizes the methods used to estimate the SRA NTG results for the Computer Efficiency program for each delivery channel.

6.3.1 Upstream incentives

The NTG research for the upstream program component centered on participating manufacturer self-reports, as these parties are best positioned to speak of the program's influence on sales of qualifying equipment market-wide. The evaluation team interviewed representatives from all five participating upstream manufacturers (four serving Colorado). Participating manufacturers were asked a variety of questions to assess the influence of the Computer Efficiency program on their sales of program-qualifying equipment as well as the larger market for efficient power supplies.

During the interviews, participating manufacturers were asked to estimate the percentage of sales of program-qualifying equipment attributable to the program, or the program's "lift" in qualifying sales. Using this approach, the NTG ratio specific to each manufacturer can be interpreted as the ratio of sales that would have occurred in the absence of the program to current sales through the program. It is important to note that this sales lift approach described above is only one measure of program attribution. Upstream manufacturers, especially those operating in national and

international markets, are not always able to precisely quantify the effect of an individual utility program on their sales.

In addition to sales lift, we investigated other qualitative indicators of program attribution and market transformation indicators (MTIs) through the manufacturer interviews. Upstream DSM programs can transform markets in several ways, such as 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 utility programs. In addition to the program's impact on their sales of efficient power supplies, interviews with participating manufacturers explored how they leverage the program incentives in their sales and marketing operations, standard practices relating to power supply efficiency, perceptions of the current state of market, and the impact of the program on encouraging customer requests and installations of efficient power supplies.

Some upstream program models may also induce spillover effects, or installations of program-qualifying equipment outside of the program. Because all sales of upstream program-qualifying power supplies in Xcel Energy's territory is submitted for incentives by participating manufacturers, *participant* spillover is not applicable for the Computer Efficiency program. Some upstream programs may also induce *nonparticipant* spillover effects by influencing the sales practices or recommendations of nonparticipating market actors; however, no nonparticipating manufacturers active in the Colorado markets were identified during the evaluation. As a result, the evaluation research did not reveal any evidence of spillover effects resulting from the upstream component of the program.

6.3.2 Downstream rebates

The SRA NTG ratio for downstream rebate projects was calculated using the following equation.

$$NTG\ Ratio = 1 - freeridership + particpant\ spillover + nonparticipant\ spillover$$

Next we describe the methodological approach and calculation of each attribution factor in the SRA NTG ratio.

A. Free-ridership

A program's free-ridership rate is the percentage of program savings attributed to free-riders. A free-rider refers to a program participant who would have taken the same energy efficiency action on their own at that same time if the program services had not been offered. It is important to measure the *extent* of free-ridership for each customer. Pure free riders (100 percent) would have installed exactly the same efficiency (where applicable) and quantity of the measure at that time in the absence of the program. Partial free riders (1–99 percent) are those customers who would have installed some equipment on their own, but a lesser efficiency, at a later date, or lesser quantity than installed through the program. Thus, the program had some impact on their decision. Non-free riders (0 percent) are those who would not have installed any program-eligible measure within a period of time in the absence of the program services.

A free-ridership score was calculated for each participant surveyed at the measure-category level. Individual free-ridership results are weighted based on the claimed gross energy savings for each participant and the distribution of program population savings by measure-category.

For downstream rebate projects, free-ridership was assessed using a methodology based on the California self-report framework for standard NTG projects[31], with some refinements specific to Xcel Energy's programs. The standard California framework uses two primary sources of information to estimate free-ridership: participant customer surveys with a key decision-maker, and influential vendor surveys with participating trade partners identified by customers as being influential in their decision-making process.

Free-ridership is calculated as an average of three scores representing responses to one or more questions about the decision to install a program measure(s). The free-ridership score is then adjusted by previous experience with an Xcel Energy program if the customer indicates that previous program participation was influential in their decision to implement the sampled project. The three scores are as follows:

1. A ***Timing and Selection*** score that captures the influence of the most important of various program and program-related elements in influencing the customer to select the specific program measure at this time. Program influence through vendor recommendations is also captured in this score.

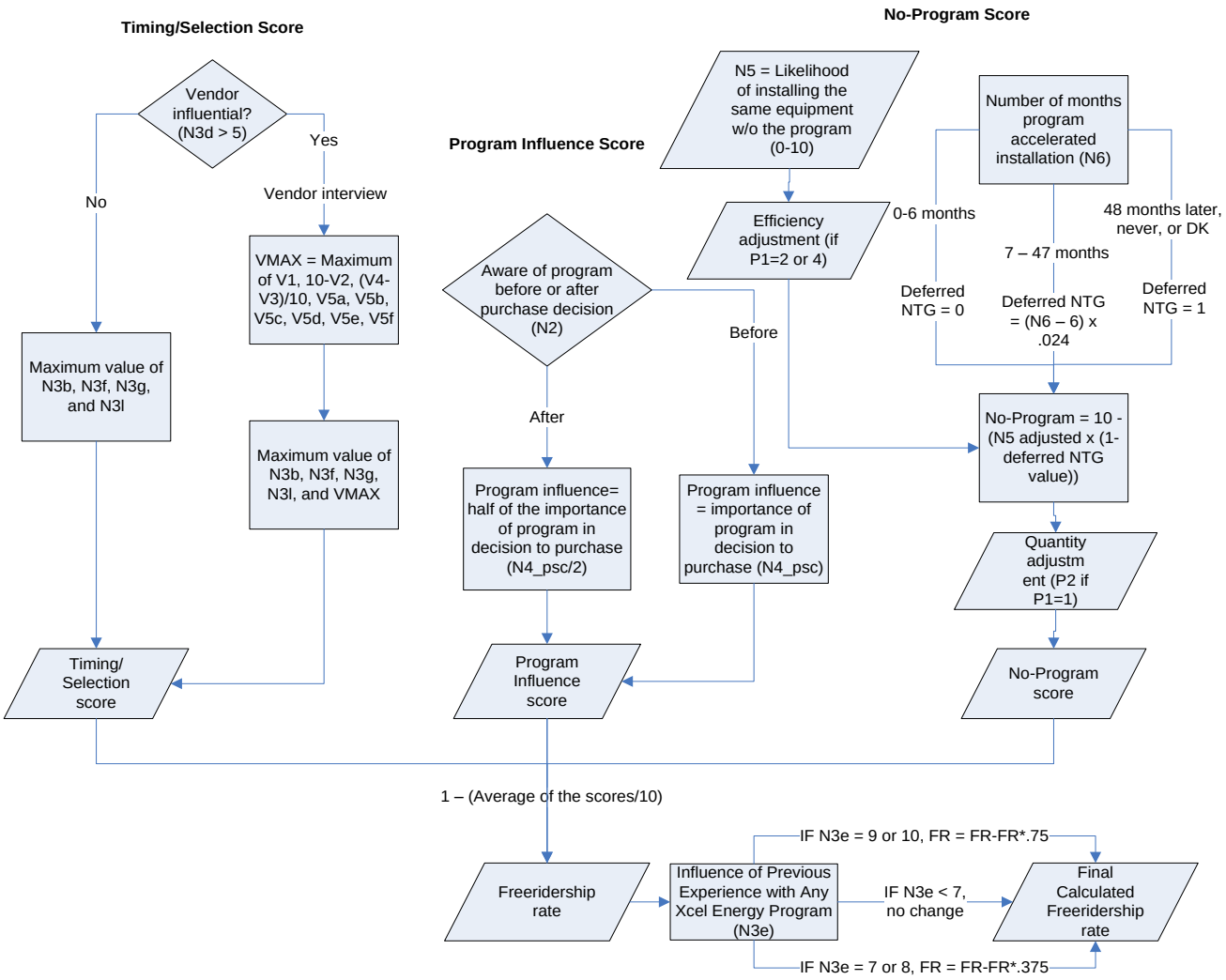
2. An overall ***Program Influence*** score that captures the perceived importance of the program (whether rebate, recommendation, program assistance or other information) in the decision to implement the specific measure(s) *relative* to the importance of non-program related factors (e.g., corporate policies prior to participation, environmental concerns, payback on investment before any program rebates). The overall program influence score is reduced by half if the respondent says they learned about the program only after they decided to install the program qualifying measure.

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

The following flowchart documents the calculation of the self-report-based free-ridership rate.

[31] 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.

Figure 6-1. Downstream Self-Report Free-ridership Flowchart



The participant survey also included a series of consistency check questions. These questions were reviewed by evaluators to assess consistency of response for each respondent across the multiple net-to-gross indicators.

B. Participant spillover

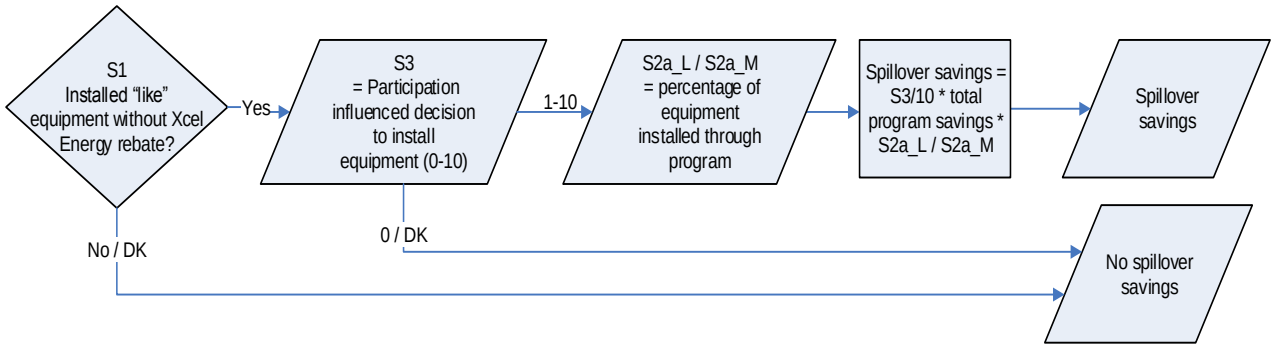
The participant customer decision-maker survey includes a series of questions designed to measure participant spillover. These questions ask about recent purchases (since program participation) of any additional energy-efficient equipment of the same type as installed through the program that were made *without* any technical or financial assistance from the utility. A participant 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 experience with the program.

One of the issues with attempting to quantify spillover savings is how to value the savings of measures installed outside the program since we are relying on customer self-reports of the

quantity and efficiency of any measures installed. We use a conservative approach and report only those measures installed outside the program that were of the same type and efficiency as the ones installed through the program. This approach allows customers to be more certain about whether the equipment they installed outside the program was the same type as the program equipment. This, in turn, makes it possible for us to use the estimated program savings for that measure (multiplied by the ratio of the quantity of equipment installed on their own versus through the program) to calculate the customer's spillover savings.

The following flowchart summarizes the algorithm used to calculate participant spillover rates.

Figure 6-2. Downstream Self-Report Participant Spillover Flowchart



The participant spillover rate is calculated as like spillover savings divided by the measure savings in the participant tracking data. A participant spillover rate was calculated for each participant surveyed at the measure-category level. Individual spillover rate results are weighted based on the claimed gross energy savings for each participant and the distribution of program population savings by measure-category.

C. Nonparticipant spillover

Nonparticipant spillover refers to energy efficient measures installed or services conducted by program nonparticipants due to the program's influence. The program can have an influence on design professionals and vendors as well as an influence on product availability, product acceptance, customer expectations, and other market effects. All may induce nonparticipants to buy more high-efficiency products than they would have in the absence of the program.

Nonparticipant spillover is estimated based on how much more of the same energy-efficient equipment the nonparticipant installed outside the program and the amount of influence the program had on the participating vendor. Only savings estimates above and beyond the participant estimate can be confidently attributed to nonparticipants.

Because vendor-reported spillover presumably includes both participant and nonparticipant spillover, participant-reported spillover estimates are removed from vendor-reported spillover estimates to calculate the nonparticipant spillover estimate.

6.4 RESULTS

Next, we present SRA NTG results for the Computer Efficiency program by delivery channel. Results are weighted to adjust for proportional sampling differences, non-response, and gross energy savings.

6.4.1 Upstream incentives

Due to the small number of respondents and interviewees' varied ability to provide quantitative estimates of the program's influence on program-qualifying sales, results from the upstream manufacturer interviews should only be viewed qualitatively. However, in certain topic areas there is agreement among responses from manufacturers.

A. Bronze Level

All five manufacturers believe that the Bronze efficiency level is now very common in the marketplace and readily available from their suppliers. Responses from the four national manufacturers indicate that Bronze level power supplies have become their standard. The four national manufacturers reported that their sales and installation practices related to the Bronze efficiency power supplies would remain the same if the program incentive was not available, indicating high levels of free-ridership at the Bronze level.

While program attribution at the Bronze level appears low for national manufacturers, feedback from the one regional manufacturer in Minnesota indicates higher program attribution. While the regional manufacturer also installs Bronze level power supplies consistently, they feel that without the Computer Efficiency incentive their sales of the Bronze level power supplies would drop off to zero within about six months. That is the estimated amount of time it would take for their existing inventory of ENERGY STAR® certified systems and 80+ power supplies to be exhausted. If the incentive was not available for spiffs to their sales reps, the sales reps would have little motivation to try to sell a higher cost power supply when they could sell the less expensive power supply. The manufacturer would also be less likely to expend the funds necessary to test, certify, and promote 80+ and ENERGY STAR® certified systems on their own.

B. Silver Level

Sales data show that manufacturers receive very few incentives for the Silver efficiency level. Only two of the five participating manufacturers sold Silver level power supplies through the program in 2015. Manufacturers confirmed that while the Bronze level efficiency has become a common installation, the Silver level is usually a level that is installed only upon customer request. While the Silver level is not a marketing focus for manufacturers, interviewees report using program incentives for their marketing budgets, and generally felt that if the differences in energy efficiency were not promoted to customers, fewer would request higher efficiency power supplies.

C. Gold and Platinum Levels

Gold and Platinum power supplies are not consistently offered by all manufacturers. Interviewees reported that the Bronze efficiency level power supply is their base level offered in most computers. To manage the amount of resources needed, each has picked a "stretch" efficiency level – either gold or platinum. Two manufacturers still focus most of their attention on Bronze level incentives (M2 and M5 in figure below). In addition, it is not the same two manufacturers offering Gold and

Platinum power supplies. Figure 6-3 below shows how inconsistent the efficient power supply offerings still appear to be based on the Computer Efficiency incentive database.

Figure 6-3. Manufacturer Incentive Status by Efficiency Level

Although a couple of the manufacturers are selling high proportions of Gold and Platinum efficiency power supplies, sales levels have not been sustained over recent years. Review of the annual incentive data from 2012 through 2015 confirms the assertion by a few manufacturers that there has been a bit of slippage from the higher efficiencies back to Bronze. For example, in Colorado, incentive data for Manufacturer 3 show about three percent of their incentives in 2014 were Bronze level, while 40 percent were Bronze in 2015.

Manufacturers that have progressed to Gold and Platinum efficiency levels say they would not sell as many without the Xcel Energy incentives. Most manufacturers feel that sales of efficient power supplies would eventually decrease if the program were not available as the incentives go directly to support marketing efforts by all manufacturers. In addition, manufacturers felt that the previous few years of marketing and 80+ promotions have served to create awareness in the commercial sector regarding higher efficiency power supplies and has driven some of the requests for Silver, Gold, and Platinum power supplies, although none of the manufacturers could quantify the marketing impact. Marketing efforts vary by manufacturer, but typically consist of general marketing regarding energy efficient power supply benefits, training for both internal sales reps and reseller staff, geographically targeted web banners to promote efficient power supplies, and spiffs to sales staff to promote 80+ power supplies.

Competition is one other factor that plays a role in the efficiency levels offered. All manufacturers have a general idea of what the others are offering customers and how they compare on price and functionality. All aspects are taken into consideration when each determines which efficiency levels to offer and how to price units. If a program incentive changes what one manufacturer carries, it may also impact what others feel they need to offer. However, manufacturers are cautious about offering and marketing units that will cost more than the competition, as customers shop around for the best price. Manufacturers do not track efficiency level sales in other territories and were unable to comment or compare how sales at specific efficiency levels varied between Xcel Energy and other territories.

D. Additional upstream triangulation research

i. Benchmarking research

The peer-utility benchmarking research conducted as part of the evaluation found only one other utility still offering upstream power supply incentives. For Efficiency Vermont, 83 percent of their 2015 incentives were applied to ENERGY STAR® and ENERGY STAR® +20% computers. Only 17 percent were 80 PLUS Gold level and less than half a percent were Platinum level. These sales distributions further support findings from the participating manufacturer research that the market has not yet transformed beyond the Bronze level, supporting high attribution for Gold and Platinum levels.

A review of NTG ratios indicates that Efficiency Vermont is currently using 100 percent, although the program manager could not confirm that and could not say whether this estimate was a measured or stipulated value, so comparability to Xcel Energy's program is low. Past documentation from 2010 found a PG&E program indicating a 70 percent NTG was used for ENERGY STAR® 5.0 desktops with a $25 rebate.

ii. Market research

Through discussions with three of the large, participating national manufacturers, Ecova compiled estimates on the share of ENERGY STAR® versus non-ENERGY STAR® desktop computers in the market from these three manufacturers and their installations of 80 PLUS power supplies. What is unknown is the proportion of ENERGY STAR® certified desktops with 80 PLUS power supplies contributed by the rest of the manufacturers, although EPA estimates that approximately 40 percent of desktops sold are ENERGY STAR® certified. 80 PLUS power supplies are required in all ENERGY STAR® certified desktops.

The second column in Table 6-3 shows the proportion of ENERGY STAR® v6 sold by the three participating manufacturers, compared with the proportion of non-ENERGY STAR® desktops. The third column shows the estimated percent without 80 PLUS power supplies and the remaining columns show the estimated percent with each 80 PLUS efficiency level power supply. The proportions in the table indicate there may still be approximately 20 percent of the desktops sold with a non-80 PLUS power supply and limited activity for 80 PLUS power supplies above the Bronze level.

Table 6-3. Estimated Participating Manufacturer Market Share of 80 PLUS Power Supplies

	ENERGY STAR® Market Share[32]	Less than Bronze	80 PLUS Bronze	80 PLUS Silver	80 PLUS Gold	80 PLUS Platinum
ENERGY STAR®v6	63%	0%	47%	6%	3%	7%
Non-ENERGY STAR®	37%	22%	14%	0%	0%	0%
Overall	**100%**	**22%**	**62%**	**6%**	**3%**	**7%**

[32] Market share estimate is based on feedback from three national manufacturers interviewed and does not represent market share across all PC manufacturers.

iii. Known future program changes

As Xcel Energy developed the 2017-2019 Triennial Plan, adjustments were made to both the baseline savings assumptions and incentive level amounts per power supply efficiency level to account for some shift in the market. Incentive levels will be lowered to $3 for Bronze, $5 for Silver, $8 for Gold, and $10 for Platinum. In addition, Xcel Energy has substantially reduced per-unit gross savings estimates for qualifying power supplies, using a weighted average of desktop power supplies currently it the market as the baseline condition. The new baseline assumption assumes 62 percent of power supplies in the market are Bronze level efficiency, based on manufacturer research. As a results, naturally-occurring Bronze level installations will be factored into gross savings technical assumptions starting in 2017, and there is evidence from regional manufacturers that the program is still influencing sales of Bronze level over lower efficiency level power supplies at the regional level.

6.4.2 Downstream rebates

As mentioned above, the evaluation team was only able to interview Minnesota participant customers, so the SRA NTG results for the downstream rebate program component is based on feedback from Minnesota participant customers only.

A. Free-ridership

Table 6-4 summarizes the number of participants surveyed, population counts and savings, and free-ridership results by major downstream rebate measure category for the Minnesota Computer Efficiency program. Overall, the participant surveys resulted in free-ridership rate of 84 percent, though these results should only be viewed qualitatively due to the small sample size.

Table 6-4. Qualitative Minnesota Downstream Rebate SRA Free-Ridership Results

Measure	Participants Surveyed (Customer Level)	Surveyed Gross Savings (kWh)	Population Gross Savings (kWh)	Free-ridership (FR)
PC Power Management	1	723,252	1,477,882	87%
Virtual Desktops	4	391,158	543,636	78%
Overall	**4**	**1,114,410**	**2,021,518**	**84%**

i. Timing and Selection score

The participant surveys resulted in a Timing and Selection score of 4.8 out of 10 (unweighted). Participant respondents indicated that a vendor's recommendation was influential in their decision to implement program measures for two of the five projects surveyed (using the criteria presented in Figure 6-1). Of these, we were able to obtain vendor contact information and complete one influential vendor interview. This vendor reported that they were not aware of the program rebate, and therefore the program was not influential in their recommendation to the customer.

On average, participants rated the information or recommendations provided by Xcel Energy staff as being most important of all program-related factors in their decision to install their program-qualifying controls system (average rating of 3.8 out of 10). The availability of the program rebate was rated the next most important program-related factor (average rating of 3.6 out of 10).

ii. Program influence score

The participant surveys resulted in a Program Influence score of 1.0 out of 10 (unweighted)[33]. The participant survey asked decision-makers to rate the importance of the program compared to the most important non-program related factor[34] in their decision to implement their project, splitting a total of 10 influence points between the program and non-program related factors. Participants gave an average rating of 2.0 for the program and 8.0 for the non-program factors. On average, the most important non-program decision-making factor was standard practice or corporate policy regarding equipment installation prior to participating in the program (average rating 9.0 out of 10), followed by payback on investment before any Xcel Energy rebates (average rating of 6.2 out of 10).

All participant interviewees reported that they were already in the process of implementing the rebated measures, or had decided to implement prior to learning about the rebates available through Xcel Energy's Computer Efficiency program. As discussed above, the Program Influence score is halved for these participants.

iii. No-program score

The average No-Program score was 0.25 out of 10 (unweighted)[35]. Three of four respondents reported it was 'extremely likely' that they would have installed the same efficient computing equipment if the Computer Efficiency program had not been available (rating of 10 on a scale of 0 to 10 with 0 being "not at all likely" and 10 being "extremely likely"), while the fourth respondent gave a rating of 9. When asked what they most likely would have done had the program not been available, all interviewees reported they would have most likely installed the exact same equipment.

iv. Previous program experience

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 program-qualifying equipment. The Massachusetts standardized methodology includes an adjustment for previous program participation in the NTG ratio, as it recognizes the importance that past participation may have had on the current project.

As shown Figure 6-1, if participants rated their past experience with an Xcel Energy program as high (a 9 or a 10 on a scale of 0 to 10 with 10 being "very important"); their free-ridership rate is reduced by 75 percent. If participants rated the importance of their past experience with the program a 7 or an 8, their free-ridership rate is reduced by 37.5 percent. Lower ratings of the importance of previous program experience did not receive any adjustment.

Three participants had previous experience with Xcel Energy program. Among these, respondents gave influence ratings of 0 (n=1) and 2 (n=2) out of 10. These responses resulted in no adjustments to free-ridership scores based on previous program experience.

[33] A Program Influence score was not able to be calculated for one respondent from the responses provided.
[34] If the respondent gave the highest rating to multiple non-program factors, the respondent was asked to the compare the program to "factors outside of the program."
[35] A No-Program score was not able to be calculated for one respondent due to "Refused" responses.

v. Review of participant comments

In addition to the structured SRA survey questions used to calculate free-ridership scores, participants were asked to tell us in their own words what influence the program had on their decision to implement program rebated measures. Respondents' open-ended responses were generally consistent with their calculated free-ridership score, attributing little or no influence of the program on their decision to install the rebated equipment. Below are a few specific responses from customers:

> *"[The program rebate] helped justifying the purchase of the thin clients but [it] wasn't a major factor"*
>
> *"[It was] nice to get the rebate and information from our account manager, but we would have done [the project] anyway."*
>
> *"[The program] didn't impact [the decision] at all…was going to do it anyway."*

B. Participant spillover

None of the four participant interviewees reported installing additional similar program-qualifying computing equipment in facilities located within Xcel Energy's territory on their own without any financial assistance from Xcel Energy. As result, the participant surveys found no attributable participant spillover.

C. Nonparticipant spillover

The one customer-identified influential vendor who was interviewed was unaware of the Computer Efficiency rebate, although he was aware that the customer knew about the rebate during the planning process. Because the vendor was not aware of the Computer Efficiency program, there was no evidence of attributable spillover from this vendor interview.

D. Calculated SRA net-to-gross ratio

Table 6-5 summarizes the combined SRA net-to-gross results for the downstream rebate program channel for the Minnesota Computer Efficiency program.

Table 6-5. Qualitative Minnesota Downstream Rebate SRA Net-to-Gross Results

Delivery Channel	Free-ridership (FR)	Participant Spillover (PS)	Nonparticipant Spillover (NS)	NTG Ratio (1 – FR + PS + NS)
Downstream Rebate	84%	0%	0%	16%

E. Additional downstream triangulation research

As discussed in the introduction, the recommended NTG ratio is based on a triangulation or preponderance of evidence approach. This section summarizes additional findings from the influential vendor interview, downstream market actor interviews, nonparticipant surveys, benchmarking information, and future program considerations.

Current low levels of nonparticipant and vendor awareness of the Computer Efficiency program, along with some nonparticipant program-eligible installations, support the low self-report NTG results for the downstream program component. However, feedback from PC power management vendors working in other territories suggests that increased marketing and outreach activity to vendors could increase customer awareness of program offerings and efficiency opportunities, leading to higher program attribution.

i. Nonparticipant awareness and activity

Surveys of 75 Colorado nonparticipants revealed low customer awareness of the Computer Efficiency program relative to several other downstream Xcel Energy programs. In addition, approximately 15 percent of Colorado nonparticipants surveyed indicated their business had implemented or were currently considering projects involving virtual desktop computers or PC power management, but most were unaware that there were rebates available. While these results cannot validate self-report free-ridership results from participants, they do suggest that some Colorado business customers implement program qualifying measures on their own without financial or technical assistance from Xcel Energy, which is consistent with the SRA results. At the same time, it also indicates the majority of the business population does not.

ii. Virtual desktop vendor awareness and activity

The one influential vendor interviewed provides computer and data center consulting services to its industrial clients. The vendor was unaware of the Computer Efficiency program rebates from Xcel Energy, but does use other rebate programs to improve cost perspectives for client managers. If customers are concerned with return on investment, it can help justify spending.

The vendor estimates that 25 to 30 percent of their industrial computing installations can be on thin client server virtualization projects. He/she estimates that the market for the industrial sector is only going to increase due to the status of devices in existing industrial plants—many of those systems are older and currently running with Windows XP, which is now non-supported. Industrial customers cannot just upgrade, even to Windows 7, without replacing hardware. Once there is a decision regarding hardware upgrades, thin clients are cheaper and quicker than desktops.

iii. PC power management vendor awareness and activity

Only one of the four PC power management firms interviewed were aware of the Computer Efficiency program. However, these vendors all install PC power management software and take advantage of rebate programs in other territories. Reviews of other utility programs shows that PC power management rebates vary by utility benchmarked. FirstEnergy currently offers rebates under their C&I Buildings program as a “custom” measure. Three utilities have a dollar per kWh saved incentive – one is $.05/kWh and two are $.10/kWh. Other utilities offer a range of prescriptive rebates, from $5 per PC controlled to $15 per PC.

Vendors find it much easier to motivate customers to install PC power management if there is no outlay for customers to get approved and if the rebate can be signed over to the vendor. The rebates allow software vendors to market the program as “free” to the customer and convince them to implement the project with far less approval red tape than if a project requires some form of capital funding.

Interviews with PC power management software vendors indicate that there is much outreach that could still occur within Colorado to increase awareness of savings opportunities and rebates. PC

power management is not something that companies have high on their priority list for energy efficiency upgrades – it may not even be on their radar. One vendor mentioned that they have sold PC power management software without rebates to companies in territories with high electric rates. Where the electric rates are lower and rebates are no longer offered, they have had no more projects.

A current trend has been for vendors to pair PC power management with security software, as that reaches more audiences. One vendor has started to actively market their PC power management software in Xcel Energy's Colorado territory, partnering with security software and fully subsidized by the Xcel Energy program rebate. A recent marketing webinar has resulted in interest from up to three school districts in Colorado.

iv. Known future program changes

The evaluation team is currently not aware of any anticipated program design or delivery changes that are likely to affect program attribution for the downstream component of the program. However, we have recommended the continued use of the current Colorado NTG estimate assuming the implementation of program design changes that would increase vendor and customer outreach, thereby increasing the program's effectiveness in influencing customer decision-making.

7. BENCHMARKING RESEARCH

This section provides summary findings from peer-utility benchmarking research conducted as part of the evaluation of Xcel Energy's Colorado Computer Efficiency program.

7.1 INTRODUCTION

The evaluation team conducted benchmarking research on utility programs with either upstream or downstream delivery or incentive similarities to Xcel Energy's Computer Efficiency program. The benchmarking research focused on gathering the following types of information:

- *Program Design:* Program scope and goals, portfolio structure, eligible measures, incentive structure, incentive levels, technical assistance, and participant eligibility requirements
- *Program Administration*: Program oversight/management, adequacy of staffing, program data collected and database tracking, effectiveness of tracking operations and finances
- *Program Implementation and Delivery*: Program procedures, staffing, marketing and recruitment strategies, trade partner outreach, participation processes, key challenges and successes
- *Market Response:* Customer and trade partner awareness, key barriers to participation, strategies for overcoming barriers to participation, and role of the program in the marketplace.
- *Net-to-Gross Assumptions:* Net-to-gross factors (freeridership, spillover), and sources of net-to-gross factors (if applicable).

The benchmarking research was conducted using a combination of Internet searches, email inquiries and telephone interviews with utility program staff. The secondary research provided high-level program information and detailed prescriptive measure offerings and rebate levels for seven utility programs of interest identified by the evaluation team and Xcel Energy staff. Four in-depth interviews were conducted with program staff to obtain further insight into design and implementation. The secondary research and in-depth interviews were completed between July and October, 2016. Interviews were conducted with program managers at the following organizations:

- Efficiency Vermont — Efficient Products
- Pacific Gas & Electric — Business Computing
- SMUD — Express Energy Solutions
- Entergy Arkansas — C&I Solutions and CitySmart

Additionally, while the Tetra Tech team was unable to conduct interviews with several other utilities, we included benchmarking results from secondary research conducted of Alliant Energy's Computer Equipment program, Energy Trust of Oregon's Existing Buildings program, and Duke Energy's Smart Saver Business program. Because Xcel Energy delivers upstream and downstream measures, the Tetra Tech team identified delivery methods for each of the interviewed program administrators, shown in Table 7-1 below.

Table 7-1. Computer Efficiency Programs

Program Administrator	Upstream	Downstream	Program Staff Interviewed
Xcel Energy	Yes	Yes	Yes
Alliant Energy	No	Yes	No
Duke Energy	No	Yes	No
Efficiency Vermont	Yes	Yes	Yes
Energy Trust of Oregon	Cancelled	Yes	No
Entergy Arkansas	No	Yes	Yes
Pacific Gas & Electric	Cancelled	Yes	Yes
SMUD	Cancelled	Yes	Yes

To gather further information on the downstream measures rebated, the Tetra Tech team interviewed four PC power management vendors to better understand what other programs they are familiar with, how they reach out to customers, how the rebates are applied, and any suggestions for program improvements.

7.2 KEY FINDINGS

Below are key findings from the benchmarking research in the following topic areas: program design, program implementation and delivery, market response, and net-to-gross assumptions.

7.2.1 Program design

- *Most downstream rebates are rolled into larger program or sector offerings.* Program administrators combine measures into larger program or sector level offerings to improve cost-effectiveness.
- *No other measures not already offered through Xcel Energy's program were identified as high-potential rebate opportunities.* Although occupancy sensing power strips were reviewed as a potential opportunity for computer efficiency, benchmarked programs were finding limited savings available from this measure due to both improvements in energy savings of newer office and computing equipment along with the requirements for what was plugged in.

7.2.2 Program implementation and delivery

- *Key targets for PC power management software are school districts and universities.* IT decision-makers can be hard to reach. Software vendors have found schools most receptive to PC power management opportunities in conjunction with security software. They also market to municipalities and corporate customers.
- *QA/QC protocols are critical to maintain measure persistence and customer satisfaction for PC power management measures.* Program managers emphasized that QA/QC protocols are particularly important for the PC power management measure. Issues with PC power management software performance can cause participants to remove it, leading to dissatisfaction with the program and utility, as well as erosion of savings.

7.2.3 Market response

- *Many program administrators cancelled upstream power supply incentives early in the 80 PLUS program history.* Currently only Xcel Energy, Otter Tail Power, and Efficiency Vermont still offer incentives for 80 PLUS power supplies. At least a dozen program administrators were at one time involved with sponsorship of incentives for 80 PLUS power supplies. However, half a dozen discontinued their incentives prior to, or at the time of, the introduction of the 80 PLUS efficiency levels (Bronze, Silver, and Gold) in 2008. The reasoning around discontinuing incentives was consistently listed by the implementer as a shift in funding to other programs as a result of limited manufacturer involvement early and only modest savings realizations across programs.
- *PC power management vendors seek out utility program rebates to offset or eliminate incremental costs to customers.* Vendors of PC power management software search out utility rebates and conduct outreach to potential customers by marketing the reduced-cost or preferably free installation opportunities.

7.2.4 Net-to-gross assumptions

- *The benchmarking research found few comparison NTG estimates for Computer Efficiency measures.* Because downstream rebates are most often included in a larger program analysis, the benchmarking effort was unable to identify comparable NTG values for downstream delivery comparison. Efficiency Vermont uses a 1.0 NTG for internal power supplies.

7.3 DETAILED FINDINGS

The detailed findings are discussed separately by Upstream and Downstream delivery methods. We first discuss the detailed findings for the Upstream portion of the program, followed by the Downstream findings.

7.3.1 Upstream program delivery

A. General history and roles

The upstream component of Xcel Energy's Computer Efficiency program incentivizes manufacturers for installing energy efficient power supplies in desktop computers sold to customers in Xcel Energy's territory. Ecova[36] implements the upstream component of the program for Xcel Energy by working directly with regional and national computer manufacturers. They reach out to and maintain the relationship with manufacturers, track performance goals and efficiency ratings, and send invoices to Xcel Energy.

The ENERGY STAR® program for certified energy efficient power supplies, 80 PLUS® was announced in 2004 and launched in 2005. Xcel Energy has worked closely with ENERGY STAR® and has been a sponsor of the 80 PLUS program since 2007. HP and Dell joined the program in 2007, followed by Lenovo in 2009. With a few manufacturers on board, 80 PLUS Bronze, Silver, and Gold desktops were introduced in 2008. Platinum desktops were introduced in 2009. Equus and Nor Tech joined by 2012.

[36] https://plugloadsolutions.com/80PlusPowerSupplies.aspx.

Table 7-2. Summary of Partner, 80 PLUS, and ENERGY STAR History

Year	Partners	80 PLUS Introductions	ENERGY STAR Releases
2004	NEEA / Xcel Energy		V3.0
2005	PG&E	1st 80 PLUS PSU	
2006			
2007	**HP / Dell** Xcel Energy, Efficiency VT, WMECO, NSTAR, Hydro Quebec		V4.0
2008	SMUD, NV Energy, BC Hydro	Bronze, Silver, Gold	
2009	**Lenovo**	Platinum	v5.0
2010	Ontario Power		
2011	Energy Trust of Oregon		
2012	**Equus / Nor Tech**		
2013			
2014	Otter Tail Power		V6.1

The table above shows that PG&E began providing incentives very early on for 80 PLUS efficient power supplies. Several other program administrators followed within the next few years, with many providing general 80 PLUS incentives prior to the introduction of the Bronze, Silver, and Gold efficiency levels.

However, 80 PLUS power supplies were not the only incentives offered by program administrators. As seen in the table below, incentives were also offered for ENERGY STAR certified desktops, either v4.0 or v5.0. While the 80 PLUS certification refers to only the power supply component, the ENERGY STAR certification encompasses the entire desktop unit. As part of the ENERGY STAR v5.0 specifications, all products registering for certification with an internal power supply had to meet the 80 PLUS Bronze power supply requirements.

In addition to rebate levels and program launch timing, the following table also indicates when program incentives were discontinued and the reasons they were discontinued according to Ecova. At least a dozen program administrators were at one time involved with sponsorship of incentives for 80 PLUS power supplies. In contrast, at least half of the program administrators that originally offered incentives discontinued theirs prior to, or as, the Bronze, Silver, and Gold efficiency levels were introduced. The reasoning around discontinuing incentives was consistently listed as a shift in funding to other programs as a result of limited manufacturer involvement early and only modest savings realizations across programs.

Table 7-3. Ecova Program Administrator History Summary

Program Administrator	Launched	Discontinued	Incentive Amounts	Reason for Discontinuation
Xcel Energy	2007	Still available	80 PLUS Platinum: $20 80 PLUS Gold: $15 80 PLUS Silver: $10 80 PLUS Bronze: $5 Rebate levels will be reduced in 2017 to: 80 PLUS Platinum: $10 80 PLUS Gold: $8 80 PLUS Silver: $5 80 PLUS Bronze: $3	N/A
Efficiency Vermont	2007	Still available	80 PLUS Gold: $10 ES v5 desktop: $7 ES v5+20% desktop: $10 2015 incentive amounts are shown. The program is still active in 2016 with lower rebate amounts of $5 for Platinum and $3 for Gold.	N/A
Otter Tail Power	2014	Still available	ES v6 with 80 PLUS Gold: $6 ES v6 desktop: $3 ES v6+20% desktop: $9	
Energy Trust of Oregon	Jan 2011	Dec 2012	ES v5 desktop: $10 ES 5+10 Display: $5	As NEEA's program began to wind down, ETO ran their own CE program, largely achieving the goals set for the program and then shifting focus to other products in their portfolio.

Program Administrator	Launched	Discontinued	Incentive Amounts	Reason for Discontinuation
Northwest Energy Efficiency Alliance (NEEA)	Jan 2005	Dec 2011	80 PLUS desktop: $8 ES v4/5 desktop: $10	First program supporter. As a market transformation organization, once a number of manufacturer partners were established, NEEA eventually shifted resources to other products/technologies to introduce to the market.
Ontario Power	Jan 2010	Apr 2011	80 PLUS desktops: $5 ES v4 desktops: $8 ES v5 desktops: $10	Designed as a short term project. Part of a short term conservation fund initiative to assess market acceptance of various products such as consumer electronics products in both commercial and residential channels.
BC Hydro	Mid 2008	Late 2009	80 PLUS desktops: $5 ES v4 desktops: $8	Some traction and savings were realized, but it was still early enough in the program where the market was not mature enough to fully achieve utility goals by the end of the contract term.
NV Energy	Early 2008	Late 2009	80 PLUS desktop: $5 ES v4 desktop: $8	The program came close to achieving savings goals, but they eventually discontinued their computer efficiency program to focus on larger savings initiatives.
SMUD	Early 2008	Mid 2009	80 PLUS desktop: $5 ES v4 desktop: $8	The program achieved some good program savings, but they eventually shifted away from the computer efficiency program to focus on larger savings initiatives.
Hydro Quebec	Late 2007	Early 2009	80 PLUS desktops: $10	Being an early adopter, there was some initial traction but the program was still early in development and unable to achieve desired savings, so funds were shifted to other programs that could garner larger savings.
NSTAR	Early 2007	Mid 2008	80 PLUS desktop: $5	Being an early adopter, program savings were modest due to limited manufacturer involvement at the time and the utility eventually shifted funds to other programs.
WMECO	Early 2007	Mid 2008	80 PLUS desktop: $5	Being an early adopter, program savings were modest due to limited manufacturer involvement at the time and the utility eventually shifted funds to other programs.
PG&E	Late 2005	Late 2007	80 PLUS desktops: $5	One of the first adopters with very aggressive savings goals. It was too early in program development to capture the level of savings the utility required, therefore they shifted funds to other programs.

B. *Current programs*

In 2016 there are two enduring upstream sponsors of 80 PLUS power supply incentives, Xcel Energy and Efficiency Vermont and one new sponsor, Otter Tail Power. Otter Tail has incentivized 80 PLUS Gold power supplies from 2014-2016 and Efficiency Vermont currently incentivizes 80 PLUS Gold and Platinum power supplies. In 2015, Efficiency Vermont transitioned from incentivizing all ENERGY STAR 80 PLUS power supplies. Both Otter Tail and Efficiency Vermont also incentivize ENERGY STAR server power supplies via their upstream program.[37] Ecova implements the upstream component of the program for utilities by working directly with regional and national computer manufacturers. They reach out to and maintain the relationship with manufacturers, track performance goals and efficiency ratings, and send invoices to program administrators.

Participation figures for Xcel Energy and Efficiency Vermont are included below. The program manager at Efficiency Vermont warned that the participation figures are not necessarily indicative of a full calendar year as there were changes made to the desktop characterizations in 2015.

Table 7-4. 2015 Power Supply Units Incentivized

Technology	Xcel Energy CO		Xcel Energy MN		Efficiency Vermont[38]	
	Count	Proportion	Count	Proportion	Count	Proportion
80+ Platinum	1,707	6.7%	11,727	39.6%	9	0.2%
80+ Gold	14,439	56.5%	2,711	9.2%	766	17.0%
80+ Silver	1	0.0%	2	0.0%	NA	NA
80+ Bronze	9,409	36.8%	15,154	51.2%	3,735[39]	82.8%
Total units	25,556	100.0%	29,594	100.0%	4,510	100.0%

Through September 2016, Efficiency Vermont incentive counts for 80+ Gold were 350, ENERGY STAR v5+20% were 1,250, and ENERGY STAR v5 were 2,670. This compares with 2015 ENERGY STAR counts of 440 for v5.0 and 3,295 for v5.0+20%.

The Tetra Tech team investigated energy savings data for Efficiency Vermont's program to compare to savings allocated for Xcel Energy's programs. The Vermont technical resource manual estimates commercial savings of 88.4 kWh at the measure level for an 80 PLUS desktop, 156.8 kWh for an ENERGY STAR v5 desktop, and included a NTG of 1.0. That

[37] Xcel Energy has a similar incentive as part of their Data Center Efficiency program.
[38] New measure characterizations were put into place in 2015 breaking out 80+ so reported numbers may not reflect the full calendar year participation.
[39] Efficiency Vermont reported incentivized units for ENERGY STAR and ENERGY STAR +20% desktops in 2015.

compares with 2015 graduated savings for Colorado of 189 kWh to 212 kWh across efficiency levels and 2015 savings in Minnesota of 303 kWh across all efficiency levels. However, Xcel Energy has substantially reduced per-unit energy savings estimates starting in 2017 to 51 kWh/year for Bronze up to 64 kWh/year for Platinum.

Verification of Efficiency Vermont's power supply measures is conducted based on the ZIP code of the shipping address for the PCs. No additional QA/QC is done on the measures according to Efficiency Vermont.

C. Awareness and outreach

Similar to the Xcel Energy program, Efficiency Vermont does not provide guidance on how the incentives are used. The program manager reports that the efficient power supply incentives are likely used for product promotion and marketing.

Efficiency Vermont is not actively marketing their upstream power supply incentives to commercial customers. Since both Xcel Energy and Efficiency Vermont do not require manufacturers to pass on incentives to their customers, manufacturers are expected to leverage program incentives to fund marketing of high efficiency power supplies. Program incentives are leveraged for reseller and sales staff training, targeted marketing activities, and to promote 80 PLUS power supplies. More details on manufacturer marketing efforts are included in the Task 4 Computer Efficiency Trade Partner Interview Findings section.

D. Market trends

While the 80 PLUS power supply specifications have been helpful for Efficiency Vermont's program, continued PC efficiency improvements have made the program less cost effective over time. Efficiency Vermont is currently considering phasing out power supply measures, although no date has been set.

A number of program administrators have discontinued their upstream computer efficiency incentives. According to their program administrator, PG&E's upstream incentives, launched in 2005 through Ecova, and then again regionally in 2008 alongside other electronic efficiency measures in their Business and Consumer Electronics program, were some of the first in the country. However, PG&E canceled these measures within two years as they felt they were seeing rapid market transformation in the industry. PG&E reports that a large number of power supplies sold in their territory exhibited efficiency beyond the 80 PLUS standard and they felt further market intervention from PG&E was unnecessary. In other cases it may be that program administrators felt their programs were not realizing the desired level of savings and redirected funds into other programs.

As seen earlier in Table 7-3, very few of the program administrators maintained incentives for more than two years. This is rarely enough time with an upstream program to get manufacturers engaged in a program, accurately tracking eligible sales, and actively generating savings.

The respondent from PG&E discussed a new approach for handling retail product incentives. There is a national retail platform pilot called the ENERGY STAR Retail Products Platform.[40] The goal of this platform is to gather a coalition of utilities to develop a meaningful scale to drive market transformation changes in certain categories. One of the concerns with previous incentives was the perceived lack of impact individual program administrator incentives had on large manufacturer engagement. The ENERGY STAR RPP does not currently offer incentives on computer products, but it could in the future.

7.3.2 Downstream program delivery

In addition to benchmarking interviews with four utilities offering downstream rebates, the Tetra Tech team conducted interviews with four PC Power Management vendors. As part of the participant survey, the Tetra Tech team also identified and interviewed an industrial consultant that implements thin client server virtualization projects.

A. Overview

Of the seven programs reviewed through the benchmarking research, most of them include downstream computer efficiency rebates for PC Power Management (6 of 7 programs). One, Alliant Energy, also offers Desktop PC Virtualization and three have Plug Load Occupancy Sensor rebates. SMUD recently cancelled their plug load occupancy sensor rebate.

For the majority of the benchmarked utilities, computer efficiency measures are integrated into general C&I programs with the exception of Pacific Gas & Electric, which has a dedicated downstream computer efficiency program similar to Xcel Energy. Although not benchmarked, another utility currently being evaluated covers PC power management projects under a commercial buildings program custom incentive.

Table 7-5. Downstream Computer Efficiency Programs and Measures

Program Administrator	Program Name	Downstream IT Measures
Xcel Energy	Computer Efficiency	Desktop PC Virtualization, PC Power Management
Alliant Energy	Nonresidential Prescriptive Rebates	Desktop PC Virtualization, ENERGY STAR Desktop and Integrated Computers, ENERGY STAR Servers, PC Power Management
Duke Energy	Smart Saver Business	PC Power Management
Energy Trust of Oregon	Business Energy Solutions	PC Power Management, Plug Load Occupancy Sensors
Entergy Arkansas	C&I Solutions, CitySmart	PC Power Management

[40] https://www.energystar.gov/sites/default/files/asset/document/ESRPP_1pager_10-07-15.pdf.

Program Administrator	Program Name	Downstream IT Measures
Pacific Gas & Electric	Business Computing	PC Power Management, Plug Load Occupancy Sensors
SMUD	Express Energy Solutions	PC Power Management, Plug Load Occupancy Sensors (cancelled)

B. Virtual desktop installation

Alliant Energy is the only program administrator we identified that offers downstream rebates for virtual desktop installations. Low and zero client desktops are rebated through Alliant Energy's Nonresidential Prescriptive Rebates program alongside appliance, refrigeration, hot water, insulation and infiltration, lighting, heating and cooling, and other plug load measures. Because we were unable to complete an interview with a program administrator from Alliant Energy, we collected publically-available information from Alliant Energy's website including the measure and incentive information shown in Table 7-6. Notably, Alliant Energy requires all thin clients to be ENERGY STAR rated and requires a minimum of ten units to be installed. Alliant Energy also offers low-interest financing to eligible customers on qualifying measures, although customers receiving financing must forgo the rebates. Dealer spiffs are available for high-efficiency electric and natural gas equipment, but it is unconfirmed if dealer spiffs would apply to computer vendors.

Table 7-6. Desktop PC Virtualization Rebates

Program Information	Xcel Energy	Alliant Energy
Rebate	$60/client	$5/unit
Minimum units	None	10
ENERGY STAR specification	N/A	Required

C. PC power management

Six of the program administrators benchmarked offer PC Power Management rebates, including Alliant Energy, Duke Energy, Energy Trust of Oregon, Entergy Arkansas, Pacific Gas & Electric, and SMUD. Generally, the software must have wake-on LAN capability to allow networked desktop PCs and monitors to be remotely wakened from or placed into any power-saving mode and to remotely boot or shut down. Program goals are typically set at the program level, and none of the PC Power Management measures have measure-specific goals. Energy Trust is reportedly dropping their PC Power Management incentive due to reduced cost-effectiveness.

Xcel Energy offers the lowest rebate at $5 per desktop controlled. Other program rebates offered range from $6 up to $15, with various eligibility standards, including minimum unit

requirements for rebates. Table 7-7 lists rebates and standards for each of the benchmarked programs.

Table 7-7. PC Power Management Rebates and Eligibility Standards

Program Administrator	Rebate	Minimum Units	Eligibility
Xcel Energy	$5/PC	None	• Must be an Xcel Energy business electric customer in the Colorado, Minnesota, or New Mexico service areas. • Purchased equipment must be new. • Rebates are available for applications on desktop PCs that operate during a typical single shift operation and must prevent computer users from overriding the power management settings. • Rebate does not apply to installations on laptops, tablets and other hardware such as virtual desktops, printers and monitors.
Alliant Energy	$6/PC	10	• Equipment must be located in a non-residential building that receives electricity from Alliant Energy. • Must include a copy of the report from the network management software verifying number of PCs being controlled by the software and the number of computers authorized per license. • Rebates are for existing buildings only.
Duke Energy	$10/PC	None	• The software must have wake-on LAN capability to allow networked desktop PCs and monitors to be remotely wakened from or placed into any power-saving mode and to remotely boot or shut down ACPI-compliant desktop PCs and monitors. • The software must give the IT administrator easily accessible central control over the power management settings of networked desktop PCs and monitors that optionally overrides settings made by users. • The software must be capable of applying specific power management policies to network groups, utilizing existing network grouping capabilities. • The software must be compatible with multiple operating systems and hardware configurations on the same network. • The software must monitor user's keyboard, mouse, CPU and disk activity in determining PC idleness. • Only existing PCs are eligible (greater than one year). • Incentive capped at 75 percent of customer's equipment cost.
Energy Trust of Oregon	$10/PC	20	• Must be served by Portland General Electric, Pacific Power, NW Natural or Cascade Natural Gas and contribute to the public purpose charge. • Must have a project site in Oregon and be improving an existing structure.

Program Administrator	Rebate	Minimum Units	Eligibility
Entergy Arkansas	$0.10/kWh	None	• Must be institutional or public/private entity (CitySmart) or large commercial (Large C&I) • Company may not allow or propose to allow laptops to be taken home overnight. • Company may not charge or propose to charge laptops in a laptop cart station overnight. • Company may not have plans to change your laptops over to tablets within the next 4 years.
Pacific Gas & Electric	$15/PC	None	• Rebate is for control of power on desktop computers only. • Customer must install qualifying software • Installed software must allow centralized, server level control of the power management settings (sleep mode and shutdown) of the desktop computers on a distributed network. • Customer must agree to keep the software installed and operating for a period of five years from the initial installation date. • Qualifying software must comply with one of the following conditions: a new installation, where none previously existed, an upgrade of an operating system or other network support software in which the desktop computer power management function did not previously exist. • Installation address must have a commercial electric account with PG&E.
SMUD	$10/PC	None	• The SMUD Express Energy Solutions program is open to all SMUD Customers receiving energy under a non-residential rate who have annual energy purchases (kWh) that exceed the proposed savings claimed by the energy efficiency Project. • In the event the Customer has less than one year of billed consumption, the annual consumption will be projected.

The Tetra Tech team also spoke about program application procedures with four vendors offering PC Power Management software through utility programs. Vendors were split on how they conducted applications for utility rebate programs. One vendor requires the customer to apply for the rebates and generally does not get involved. Another fulfills application requirements and receives rebates on behalf of the customers. The other two vendors said it depends on the program details and rebate amount as well as customer needs.

D. Outreach

Utility outreach for customers PC Power Management programs is somewhat limited. PG&E maintains a list of PC Power management vendors on its website for potential customers, but the program manager notes that identification of decision-makers can be difficult. Typically, decision-makers may not have a good connection with utility account representatives. One program manager suggested that approaching the customer through channel identification

and marketing, and developing strong relationships with software vendors, can help in more effective targeting and outreach. Another program manager said account managers are the first line of communication for most large facilities with potential IT savings. Additionally, one utility noted that vendors and account managers were actively marketing to schools and universities, but that marketing to C&I clients had proven challenging. Identifying the correct decision-maker at the corporate level, combined with the need for flexibility in many commercial environments, has made uptake low for this market segment.

The evaluation team also spoke about marketing and outreach practices with vendors offering PC Power Management software through utility programs. Two of the companies reported having previous business in Xcel Energy's Minnesota and Colorado territories. The customer base for the vendors consisted of K-12 and higher education (four vendors), other public sector buildings (two vendors), and corporate customers (two vendors). Most vendors listed IT and Facilities departments as entry points for their marketing efforts, although they cautioned that they may not have decision-making capacity and may have to pass the project up the chain to a superintendent or energy manager. All vendors reported that they often combine their PC Power Management products with additional software such as security and virus protection, data restoration, and PC management. Two vendors reported that marketing efforts often centered around these products, with return on investment and energy benefits being secondary. The other two, who focused on K-12 and university customers, said that cost and payback were very important to program participation, and preferred rebates that covered the entire cost of the project.

7.3.3 Lessons learned

QA/QC can be difficult, but important with PC Power Management programs. Because the software is often installed on a large number of computers, verifying the installation can be a complex process. However, one program administrator cautioned that it was vital to the cost-effectiveness and viability of the program, especially if a vendor is not supporting its product. If a customer has problems with the software, and the vendor is not trouble shooting and resolving the issue, the customer is likely to disengage the PC power management software.

One benchmarked utility recommends requiring proper software training, running regular reports, and post inspections to check a random sample of PCs are still controlled by the software. Most programs also limit the applicability of laptops in the program, either restricting or eliminating their use. As with any program, vendor issues need to be closely monitored and resolved to ensure continued customer satisfaction with programs and the utility overall.

A combination of market saturation and technology innovation is causing a slowdown in program participation across the surveyed utilities. Discussions with utility program administrators and software vendors also indicated that participation has been primarily targeted to the education sector, which has been the easiest to reach, while private companies were more challenging. Several vendors also noted that their PC Power Management software had taken a back seat to their other software offerings.

A. Market trends

The industrial consultant we spoke with felt that the thin client market within the industrial sector could increase. The primary reason is that existing industrial plants often have systems

running with XP, which is now non-supported. Upgrades cannot be made, even to Windows 7, without replacing hardware. Once there is a decision about replacing hardware, thin clients are cheaper than regular desktops and quicker to set up. In certain cases they can also be locked down and each can be managed for specific uses.

An additional objective of the benchmarking effort was to investigate other possible measures to rebate. Initial review found there were limited programs that included occupancy sensing power strips. In some cases the rebates had been available and then discontinued, while a few others were likely to discontinue soon. Programs were finding limited savings available from this measure due to both improvements in energy savings of newer office and computing equipment along with the requirements for what was plugged in, such as monitors and printers, for the measure to contribute any significant savings.

APPENDIX A: PROGRAM STAFF INTERVIEW GUIDE

This topic guide was used for interviews with internal program staff involved in the administration and delivery of the program. While this guide served to offer consistent direction to the interviewer(s), interviews were tailored based on the specific roles and responsibilities of each interviewee.

Role within Xcel Energy and/or the Program(s)

1) Responsibilities or role regarding the program

   - when became involved
   - how have responsibilities/role changed over time
   - on average, what percent of your workload is spent on the program monthly?

2) Who do you interact with (others) regarding the program?

   - Other Xcel Energy staff, trade partners, customers, implementation contractors, other organizations
   - Roles and responsibilities of these other persons
   - Success of interactions; suggestions for improvements

Program Design and Marketing

3) Who was involved in the program design?

4) Was the program patterned after another program(s)? If so, were any modifications made to improve the program design?

5) How has the program design changed in the past couple of years? If yes, why did you make those changes? Were these changes driven internally or from external stakeholders?

6) Are you considering any design changes in the near future? If yes, why are you considering these changes? Are these considerations being driven internally or from external stakeholders?

7) Does the program have any other goals in addition to energy/demand savings and participation targets? How are program goals communicated internally and externally? How well has the program been performing in relation to goals? Why?

   - Market transformations objectives
   - Other goals?

8) Are there sufficient program resources to meet the programs goals? (Probe: Examples of resources are staff resources, incentives, program partners support, and marketing materials.)

9) Is there any overlap in the program's offerings or target markets with other Xcel Energy offerings? If so, does this overlap with other offerings or parties within the program structure create any challenges or barriers to implementing the program?

10) Do the incentive levels seem appropriate? If not, why not? What, if any, changes in the incentive levels do you think may be needed?

11) How does the type of equipment being purchased and installed through the program vary? Why do you think there is this variation?

12) What are the target markets for the program?

13) Who identifies prospective customers for the program and how are they identified?

14) What marketing activities are being used to reach the different target markets? How have these methods changed over time? How effective have each of these methods been in identifying and enrolling potential participants? Why?

15) Does your program use Xcel Energy's standard definition of a 'participant'. If not, how does it differ and why? Are your participants typically new to Xcel Energy DSM programs or have they previously participated in Xcel Energy programs?

16) How do you define nonparticipants? What seems to lead to lost opportunities or closed-losses'?

17) What are major barriers to participation?

   - Why do you think customers choose to participate or not participate?
   - What are the comparative strengths of these reasons?
   - Are the marketing efforts designed to build on customers' reasons for participation and minimize reasons for nonparticipation?

18) How would you describe the program's trade partner infrastructure? What types of trade partners are involved with the program? What role(s) do they play in the program?

19) How are trade partners recruited into the program? What makes your trade partners unique in their offerings due to the program?

Program Operations

20) What are the participation steps from the customer's perspective? Have these changed over time?

21) What is the overall quality/accuracy of the project applications that you receive? Have you taken any steps recently to improve the quality of these applications? What improvements are needed?

22) Describe your communications and working relationship with trade partners. What support is provided through the program to trade partners? In what areas could this be improved?

23) What is your perception of 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?

24) What aspects of the program implementation are working well? Which are not working well?

25) What do you see as future challenges for the program?

26) Is the system used for tracking participants and nonparticipants helpful or not? What would be helpful to track that is not currently available? How easy is it to use the tracking system?

Program Impacts

27) (If applicable) What NTG ratio(s) is the program currently using for planning purposes? When and how were these estimates last evaluated?

28) Do you feel the program influences customer's decision-making process for certain projects/measures differently than others? How so?

29) How are you seeing the market transform through your trade partners and customers?

- What influence do you think the program had on these market changes? Why do you say that?
- How has the program adapted to these market changes to sustain impacts?

Evaluation

30) What are your needs from this evaluation? What do you hope to learn from the evaluation?

31) Do you have any specific questions that you want to make sure are included in primary data collection activities with customers or market actors?

- Customer research (participants and nonparticipants)
- Trade partner interviews
- Benchmarking research

32) What time period of participation is most appropriate for defining the participant research population?

33) (If applicable) How should nonparticipants be defined for the evaluation research? What would be most useful for your needs (e.g., general population, closed-losses)

34) The evaluation results will be used in part to inform future program design and filings. Anything additional you would like evaluation to focus on with this objective in mind?

35) Other Suggestions for Improvements

APPENDIX B: PARTICIPANT CUSTOMER INTERVIEW GUIDE

This questionnaire was used to conduct semi-structured interviews with participant customers of the Computer Efficiency Program.

Introduction

[INTERVIEWER INSTRUCTION: Before interview begins, please record values for each of these variables found in the sample file for this case. These items will be used within this interview:]

Contact info	Name and phone for contact from program tracking
Location	Address, city, state of equipment installation
Date	Date of participation/rebate payment
Meas_Des	Summarized description of all measures implemented through program (Virtual Desktop installation, PC power management, or Virtual Desktop installation and PC power management)
Measure	Specific measure(s) implemented through the program (Virtual Desktop installation, PC power management)
Quantity	Amount installed
EE_Meas	Measure selected for NTG questions(Virtual Desktop installation, PC power management)

Contact info: _____

Location: _____

Date: _____

Meas_Des: _____

Quantity: _____

EE_Meas: _____

Hello, my name is **[INTERVIEWER NAME]**, and I'm calling on behalf of Xcel Energy regarding your firm's participation in their Computer Efficiency 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 the **[MEAS_DES]** project that you recently implemented through Xcel Energy's Computer Efficiency Program. You may have received a letter explaining the purpose of this call.

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 will take approximately 30 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.)

(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 Nick Minderman at (612) 330-6362)

NAME: _____

COMPANY:_____

TITLE: _____

PHONE/EMAIL: _____

INTERVIEWER: _____

DATE COMPLETED: _____

Identification of Decision-Maker

C1 Our records indicate that you received a rebate for installing **[MEAS_DES]** through the Computer Efficiency Program around **[DATE]** for your location at **[ADDRESS].** Is this correct?

(Check any other participation dates and locations)

1 Yes
2 Recalls participation, but some information is incorrect [SPECIFY WHAT]
3 Does not recall participation

C2 Are you the person most knowledgeable about your organization's decision to implement the **[EE_MEAS]** through Xcel Energy's Computer Efficiency Program?

1 Yes (SKIP TO I1)
2 No

C3 Is there someone else at your firm who would be more knowledgeable about your organizations' participation in Xcel Energy's Computer Efficiency Program?

1 Yes *(Ask to speak with them)*
2 No

C4 Who else at your company, if anyone, was involved in the decision of whether or not to implement the **[EE_MEAS]** through the Computer Efficiency Program?

Net Promoter Information

NPS1 On a scale from 0 to 10, where 0 means Not at all likely and 10 means Extremely likely, how likely are you to recommend Xcel Energy to a friend, relative or colleague?

0 Not at all likely 1 2 3 4 5 6 7 8 9 10 Extremely likely
D DON'T KNOW
R REFUSED

NPS2 What is the primary reason for your rating?

[RECORD VERBATIM RESPONSE]

Installation Verification

(REPEAT I1 – I4 SERIES FOR EACH MEASURE INSTALLED THROUGH PROGRAM)

I1 Is/are the **[MEASURE]** still installed and operational at your facility at **[ADDRESS]**?

1 Yes *(SKIP TO PA1)*
2 No, none are installed
3 Some are installed, some are not installed (SPECIFY: How many units are NOT installed?)

I2 Was it/Were they ever installed?

1 Yes *(SKIP TO I4)*
2 No

I3 Do you plan on installing **[MEASURE]** at **[ADDRESS]**?

1 Yes➔When do you plan to install it? _____ (month) ____ (year)
2 No

I4 Why isn't it currently operating at **[ADDRESS]**? [RECORD VERBATIM]

Source of Program Information

PA1 How did you learn about the rebate available through Xcel Energy's Computer Efficiency Program? (Probe: method and source) Did you hear about the program from any other sources?

PA2 How would you prefer to receive information about assistance available through Xcel Energy's energy efficiency programs in the future? (Probe: method and source)

PA3 Prior to participating in the Computer Efficiency Program in **[YEAR]**, had you previously participated in any Xcel Energy's energy efficiency programs?

1 Yes
2 No

Free-ridership

NINTRO For the next series of questions, I would like to focus on the **[EE_MEAS]** you implemented through the program.

N1 Why did you decide to implement the **[EE_MEAS]**? (Probe: Were there any other reasons?)

N2 Did you learn about the rebates available from Xcel Energy for implementing **[EE_MEAS]** through the program BEFORE or AFTER you made the final decision to implement the **[EE_MEAS]** you did?

1 Before
2 After
3 At the same time

N3INT The Computer Efficiency Program provided a rebate to help implement the **[EE_MEAS]** project.

With that in mind, I'm going to ask you to rate the importance of factors that might have influenced your decision to implement the **[EE_MEAS]**. 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 implement the **[EE_MEAS]**.

If any of the factors mentioned are not applicable to your experience, just say "not applicable".

N3B Availability of the program rebate or financial incentive
N3D Recommendation from a contractor, vendor, or supplier [IF > 5, COLLECT NAME AND CONTACT INFORMATION OF VENDOR AND INTERVIEW VENDOR AT END OF SURVEY)
N3E [PA3 = 1] Previous experience with any Xcel Energy program
N3F Information from an Xcel Energy training course, seminar, or Expo
N3G Information from the program or utility marketing materials
N3H Standard practice or corporate policy in your business regarding equipment installation prior to participating in the program
N3I Payback on investment before any Xcel Energy rebates
N3J General concerns about the environment, global climate change, or energy independence

N3K Financial assistance or rebate from another organization that is not Xcel Energy

N3L Information or recommendations provided to you by any Xcel Energy staff

N3MASK Is there anything else that influenced your decision to implement the **[EE_MEAS]** that I haven't mentioned?

1 Yes (SPECIFY)
2 No

N3M [ASK IF N3M_ASK = 1] Using a 0 to 10 scale, where 0 means not at all important and 10 means very important, how important was…
The other factor(s) you mentioned

N4INT Now I'd like to ask you about the importance of the Computer Efficiency Program to your decision.

I'd like you to rate the "overall importance of the program" VERSUS "the overall importance of **[show highest rated of N3h, N3i, N3j, or N3k; in the case of a tie, show "factors outside of the program"]**" in your decision to implement the **[EE_MEAS]** so that the two scores add up to 10.

[IF NEEDED: 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 Computer Efficiency 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 Computer Efficiency 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 implemented the **[EE_MEAS]** f the Computer Efficiency Program had not been available?

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

N6 (ASK IF N5>0 AND N5<>D OR R) You just said that there was a **[N5 RESPONSE]** in 10 likelihood that you would have implemented the **[EE_MEAS]** if the Computer Efficiency Program had not been available.

How many months LATER do you think you would have implemented the **[EE_MEAS]**?

[INTERVIEWER NOTE: PLEASE ENTER IN MONTHS]

___ Number of months later
E Earlier
N Never

Partial Free-ridership

P1 Supposing that you had not participated in the Computer Efficiency Program or received information and expertise about implementing the **[EE_MEAS]** from Xcel Energy**,** which of the following alternatives would you have been MOST likely to do?

[READ LIST, OPTIONS 1-5 ARE RANDOMIZED]

	VDI Categories	**PC Power Mgmt Categories**
1	Installed fewer virtual desktops	Deactivated the original power management settings on some and left others
2	Installed regular desktop PCs	Left original computer power management settings on all computers
3	Purchased laptops or tablets	--
4	Done nothing, or kept the existing equipment as is	Deactivated all original computer power management settings
5	Install the exact same equipment	Purchase the same PC Power Management software as through the program
6	Or something else (SPECIFY)	Or something else (SPECIFY)

P2 (IF P1=1 and VDI) Of the units you installed through the program, what percent would you have installed or implemented if the program had not been available?

(IF P1=1 and Pwr Mgmt) Of the computers on which you implemented power management settings, what percent would you have activated or implemented if the program had not been available?

[RECORD PERCENTAGE OF UNITS ACTUALLY INSTALLED]

[IF NEEDED: "For example, would you have installed/activated about one-fourth (25%), one-half (50%), three fourths (75%) of what you installed/managed through the program."]

___ Percentage of units would have installed/activated

P3 (IF P1=3 and VDI) Can you tell me what model or efficiency level you were considering as an alternative? (INTERVIEWER NOTE: IT IS OK TO TAKE AN ANSWER SUCH AS “10% more efficient than code”, “10% less efficient than the program equipment”, “standard efficiency equipment”, or “I would not have installed VDI”.)

(RECORD VERBATIM)

Free-ridership Consistency Checks

T1 How influential was the Computer Efficiency **Program**, including all of the information and technical assistance you received, in planning the design and installation of the **[EE_MEAS]** 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 Was the program rebate included as part of your capital spending proposal to get the project approved?

1 Yes
2 No

T3 In your own words, please describe what impact, if any, all the rebates you received through the program had on your decision to implement the **[EE_MEAS]** project at the time you did?

(RECORD VERBATIM)

Like Spillover

S1 Since participating in the Computer Efficiency Program, have you installed or implemented any of the same **[EE_MEAS]** on your own **without** the rebate from an Xcel Energy program at this facility or at other locations served by Xcel Energy in **[STATE]**?

1 Yes, only at this facility
2 Yes, only at another facility
3 Yes, at both this and another facility
4 No/DK/REF (SKIP TO NEXT SECTION)

S1a What equipment was installed?

(RECORD VERBATIM)

S2a Thinking of the **[EE_MEAS]** equipment that you installed on your own, was this more, less, or the same amount of **[EE_MEAS]** equipment as what you installed through the program?

1 More
2 Less
3 Same amount (SKIP TO S3)
D DON'T KNOW (SKIP TO S3)

S2a_M (ASK IF S2a = 1) Compared to the amount of **[EE_MEAS]** equipment that you installed through the program at **[ADDRESS]**, how much **[EE_MEAS]** equipment did you install on your own?

We're looking for a percent compared to the amount installed through the program. For example, if it was about twice as much as what you installed through the program you would say 200%.

[INTERVIEWER NOTE: An answer of 100% here would be S2a=3, same amount.]

____Enter percentage [101-800%]
D DON'T KNOW (SKIP TO S3)
R REFUSED (SKIP TO S3)

S2a_L (ASK IF S2a = 2) Compared to the amount of **[EE_MEAS]** equipment that you installed through the program at **[ADDRESS]**, how much **[EE_MEAS]** equipment did you install on your own?

We're looking for a percent compared to the amount installed through the program. For example, if it was about half as much as what you installed through the program you would say 50%.

[INTERVIEWER NOTE: An answer of 100% here would be S2a=3, same amount.]

____Enter percentage [1-99%]
D DON'T KNOW (SKIP TO S3)
999 REFUSED (SKIP TO S3)

S2b So, just to confirm, the amount of additional energy efficient equipment you bought on your own, without an Xcel Energy rebate was **[S2a_M OR S2a_L]** of what you got through the program?

1 Yes, that's correct
2 No, that's incorrect (SKIP BACK TO CORRECT S2a_M or S2a_L)

S3 I'm going to read a statement about the energy efficient improvements 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 your level of agreement with the following statement:

My past experience with Xcel Energy's programs influenced my decision to implement this/these improvement(s) on my own.
__ (0-10)
D DON'T KNOW
R REFUSED

S4 Why did you implement this energy efficiency improvement 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/couldn't wait for rebate
3 The project would not qualify (SPECIFY: WHY NOT?)
4 The rebate amount wasn't large enough
5 Did not know program was available for this equipment
6 Outside of Xcel Energy territory
7 Other (SPECIFY)

Participant Experience and Program Satisfaction

Next I'd like to ask you some questions about your experiences when participating in the Computer Efficiency Program.

SA1 Who completed the program application? (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 The equipment vendor
5 Respondent
6 Someone else at your company (SPECIFY ROLE/DEPARTMENT)
7 Other (SPECIFY)

SA2 (IF SA1 = 5 or 6) Did you require any assistance from Xcel Energy staff or an equipment vendor to complete the program application? If yes…

SA2a From whom did you receive assistance?

SA2b With what did you require assistance?

SA3 What hurdles did you face, if any, when deciding whether or not to implement the energy efficient computing equipment through the program?

(RECORD VERBATIM)

S4 How did the Computer Efficiency Program help you overcome these hurdles?

(RECORD VERBATIM)

SA5 What benefits has your company realized, if any, as a result of your participation in the Computer Efficiency Program?

SA6 Next, I'd like you to tell me how satisfied you are with specific aspects of the Computer Efficiency Program on a 0-10 scale with 0 being very dissatisfied and 10 being very satisfied. (Probe: for each rated < 5, why do you say that?)

a. __ (0-10) The type of equipment or improvements eligible for the program
b. __ (0-10) Requirements for project eligibility
c. __ (0-10) The clarity of the program's terms and conditions
d. __ (0-10) The amount of the program rebate
e. __ (0-10) The program application process
f. __ (0-10) The program's handling of your questions or concerns
g. __ (0-10) The amount of time it took to receive the rebate
h. __ (0-10) (if applicable) The contractor who installed or implemented the energy efficient improvements
i. __ (0-10) The amount of energy savings you've seen since the project completed

SA7 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 Computer Efficiency Program? Why do you say that?

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

SA8 Based on your experiences, which aspects of the Computer Efficiency Program**,** if any, would you change? Why do you say that? (Probe: anything else?)

SA9 Next, 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

SA10 Has your experience with the Computer Efficiency Program increased, decreased, or not changed your satisfaction with Xcel Energy overall? Why do you say that?

1 Increased
2 Decreased
3 Not changed

Customer Profile

Finally, I'd like to ask you some questions about your business for classification purposes only.

F1 Which of the following best describes your organization? (READ, SELECT ONE)

1 Local, state, or federal government institution
2 For-profit business
3 Non-profit business
4 Something else (SPECIFY)

F2 What business activity accounts for most of the floor space covered by your Xcel Energy bill at **[ADDRESS]**? (DO NOT READ, ACCEPT ONE RESPONSE)

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 Financial
9 Health care
10 Lodging
11 Agricultural
12 Municipal/Governmental
13 Other (SPECIFY)

F3 Which of the following best describes the space covered by your Xcel Energy bill at **[ADDRESS]**? Is it. . ? (READ LIST)

1 Located in an enclosed shopping mall
2 Located in an unenclosed shopping mall
3 Occupying part of a single building with apartments attached
4 Occupying an entire single building with apartments attached
5 Located in a complex of buildings
6 Space that is the common area of an apartment/rental property
7 Occupying part of a free-standing building; both manufacturing & office space
8 Something else (SPECIFY)

F4 Do you own or 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)

F5 Is your facility at **[ADDRESS]** your company's only location, one of several in the region, or one of several across the nation?

1 Only location
2 One of several in region
3 One of several across the nation

F6 Approximately how many full-time and part-time employees are employed by your business at **[ADDRESS]**?

1 Less than 10
2 10-49
3 50-99
4 100-249
5 250-499
6 500 or more

F7 Does your company have any corporate policies related to energy efficiency standards that you need to consider when purchasing new equipment or making improvements to this facility?

1 Yes
2 No

F8 (IF F7 = 1) Which of the following best describes this policy? (READ LIST)

1 Purchase energy efficient equipment regardless of cost
2 Purchase energy efficient equipment if it meets payback or return on investment criteria
3 Purchase standard efficiency equipment that meet code
4 Something else (SPECIFY)

N3_DVEN (IF (N3D > 5), VENDOR INFLUENTIAL IN DECISION-MAKING PROCESS)

Earlier you indicated that the recommendation from a contractor, vendor, or supplier influenced your decision to install **[EE_MEAS].**

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

1 Yes (COLLECT VENDOR NAME, TITLE, COMPANY, AND PHONE)
2 No

F9 What is your job title?

F10 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

F11 As part of our evaluation, we may need to follow-up on some of this information. Would it be all right if someone contacted you again if needed?

1 Yes
2 No

COM Those are all of the questions I have for you. Do you have any comments you'd like us to share with Xcel Energy?

(RECORD ANY COMMENTS VERBATIM)

Thank you for your time. This completes our interview.

APPENDIX C: NONPARTICIPANT CUSTOMER SURVEY INSTRUMENT

This structured questionnaire was used for computer-assisted telephone interviews (CATI) with nonparticipant customers for the 2016 evaluations of the following Minnesota and Colorado programs. One nonparticipant survey instrument was used for all programs. Program-specific questions are noted where applicable.

Minnesota	Colorado
MN Lighting Efficiency	CO Small Business Lighting
MN Computer Efficiency	CO Computer Efficiency
MN Efficiency Controls	

Sample variables

The following fills will be used throughout the survey. Some of these may need to be revised once we have had a chance to examine the nonparticipant database.

[PROGRAM] Program name

1 Efficiency Controls (MN)
2 Lighting Efficiency (MN)
3 Small Business Lighting (CO)
4 Computer Efficiency (MN and CO)

[MNEC_ELIGIBLE] Flag indicating whether customer is eligible for MN Efficiency Controls program

0 Ineligible
1 Eligible

[MNLGT_ELIGIBLE] Flag indicating whether customer is eligible for MN Lighting Efficiency program

0 Ineligible
1 Eligible

[COSBL_ELIGIBLE] Flag indicating whether customer is eligible for the CO Small Business Lighting program

0 Ineligible
1 Eligible

[ADDRESS] Facility address

[CONTACT NAME] Customer contact name (if available)

[BUSINESS NAME] Customer business name

[STATE] Customer State

1 MN
2 CO

[CLOSED] Flagged as a 2015 or 2016 closed loss (MN Lighting Efficiency only)

1 Customer flagged as closed loss
0 Customer NOT flagged as closed loss

[CLOSEDYEAR] Closed loss year; 2015 or 2016 (MN Lighting Efficiency only)

Introduction

Hello, my name is **[INTERVIEWER NAME]**, and I'm calling on behalf of Xcel Energy.

(IF CONTACT NAME AVAILABLE) May I speak with **[CONTACT NAME]**?

(IF NO CONTACT NAME) May I speak with the person most familiar with purchasing and maintaining the energy-using equipment for **[BUSINESS NAME]** at **[ADDRESS]?**

1 Yes
2 No [attempt to convert]

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

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

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

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

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

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

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

purpose of the study or its use, please contact Xcel Energy's Business Solutions Center at 1-800-481-4700 (Monday - Friday 8:00 AM - 5:00 PM)).

Identification of Decision-Maker

C1 (IF CLOSED = 1) Our records show that your organization considered implementing an energy efficient lighting project through Xcel Energy's Lighting Efficiency program in **[CLOSEDYEAR]** at **[ADDRESS]**. Is this correct?

1 Yes
2 No
D DON'T KNOW
R REFUSED

C2 (IF C1 <> 1) Is there anyone else at your firm who would be more knowledgeable about your organizations' involvement with the program? May I please speak with that person?

1 Yes (SPECIFY NAME AND BEGIN THE SURVEY AGAIN WITH THIS NEW RESPONDENT)
2 No
D DON'T KNOW
R REFUSED

C3 (IF CLOSED = 0 OR C1 <> 1) Are you the person who is most knowledgeable about the decision-making process for maintaining or purchasing new energy-using equipment at this location at **[ADDRESS]**?

(IF CLOSED = 1 AND C1 = 1) Are you the person who is most knowledgeable about your organization's involvement with this lighting project?

1 Yes (SKIP TO NPS1)
2 No (ASK C4)

C4 (IF CLOSED = 0 OR C1 <> 1) Who else at your firm would be more knowledgeable about your organizations' decision-making processes related to maintaining existing equipment or purchasing new energy using equipment at this location? May I please speak with that person?

(IF CLOSED = 1 AND C1 = 1) Who else at your firm would be more knowledgeable about your organization's involvement with this lighting project? May I please speak with that person?

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

NPS1 On a scale from 0 to 10, where 0 means 'not at all likely' and 10 means 'extremely likely,' how likely are you to recommend Xcel Energy to a friend, relative or colleague? (Select one response)

0	Not at all likely
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	Extremely likely
D	Don't know

NPS2 What is the primary reason for your rating?

[OPEN ENDED RESPONSE]

98 No comment

Closed Losses (MN Lighting Efficiency Only)

(ASK THIS SECTION ONLY IF CLOSED = 1 AND C1 = 1; ELSE SKIP TO PA1)

L1 Has your organization completed the lighting project we just mentioned?

[IF NEEDED: the lighting project you considered implementing through Xcel Energy's Lighting Efficiency program?]

1 Yes
2 No
D DON'T KNOW
R REFUSED

L2 (IF L1 = 1) Did your organization apply for a rebate for this project, either through an Xcel Energy program or some other program?

1 Yes
2 No
D DON'T KNOW
R REFUSED

L3 (IF L2=1) Which program did you apply to? (DO NOT READ)

1 Xcel Energy's retrofit Lighting Efficiency program
2 Xcel Energy's new construction Lighting Efficiency program
3 One Stop Shop program (Center for Energy & Environment)
4 Other (SPECIFY)
D DON'T KNOW
R REFUSED

L5 (IF L1=2) Do you plan to complete the project in the future?

1 Yes
2 No
D DON'T KNOW
R REFUSED

L9 (IF L5=1) Do you plan to submit an application for rebates for the project, either through an Xcel Energy program or some other program?

1 Yes
2 No
D DON'T KNOW
R REFUSED

L12 (IF L9=1) Which program do you plan on applying for? (DO NOT READ)

1 Xcel Energy's retrofit Lighting Efficiency program
2 Xcel Energy's new construction Lighting Efficiency program
3 Onestop Shop program (Center for Energy & Environment)
4 Other (SPECIFY)
D DON'T KNOW
R REFUSED

Computer Use and Decisions

V1 Do you have an IT Department or staff within your organization that handles decisions related to computer equipment purchasing or computer power management?

1 Yes
2 No (SKIP TO V3)
D DON'T KNOW (SKIP TO V3)
R REFUSED (SKIP TO V3)

V2 Do you have local IT staff or are all IT staff located elsewhere?

1 Have local IT staff
2 IT staff is located elsewhere
3 Other (SPECIFY)
D DON'T KNOW
R REFUSED

V3 Are IT purchases made in large batches and rolled out to individual locations or are they made separately for each location?

1 Large batch purchasing for multiple locations
2 Purchased for individual locations separately
3 Only one location
D DON'T KNOW
R REFUSED

V4 Approximately how many computing devices, including desktop PCs, laptops, and tablets, are used by company staff at this location? Your best estimate is fine.

___ # of computing devices
D DON'T KNOW
R REFUSED

V5 Thinking of the computers used at your location, about what percent would you say are desktop computers and what percent are other devices such as laptops or tablets? (IF NEEDED: A best estimate is fine) (TOTAL MUST ADD TO 100%)

___% Desktops
___% Other devices such as laptops or tablets
D DON'T KNOW
R REFUSED

Program Awareness

PA1 (IF CLOSED = 0) 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?

(IF CLOSED = 1) Other than the Lighting Efficiency program, are you aware of any other rebate or technical assistance programs offered by Xcel Energy?

1 Yes
2 No (SKIP TO PA10)
D DON'T KNOW (SKIP TO PA10)
R REFUSED (SKIP TO PA10)

PA2 (IF PA1=1) What programs are you aware of? (DO NOT READ; SELECT ALL THAT APPLY)

1 Efficiency Controls (provides rebates to help business customers install automated control systems in their facilities)
2 Lighting Efficiency (provides rebates to help business customers upgrade lighting equipment in their facilities)
3 Small Business Lighting (provides rebates and technical assistance to help small business customers upgrade lighting equipment in their facilities)
4 Computer Efficiency (provides rebates to help business customers install high efficiency computing equipment and power management software)
5 Other program(s) (SPECIFY)
D DON'T KNOW
R REFUSED

PA3 (IF PA2<>4) One specific program Xcel Energy offers is called the Computer Efficiency program, which offers rebates to help business customers install high efficiency computing equipment and power management software. Before today, had you heard of this program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

PA4 (IF PA2<>2 AND MNLGT_ELIGIBLE=1 AND (CLOSED=0 OR C1<>1)) Another one of Xcel Energy's programs is called the Lighting Efficiency program, which offers rebates to help business customers upgrade lighting equipment in their facilities. Before today, had you heard of this program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

PA5 (IF PA2<>1 AND MNEC_ELIGIBLE=1) Another one of Xcel Energy's programs is called the Efficiency Controls program, which offers rebates to help business customers install building control systems in their facilities. Sometimes these are called Energy Management Systems or Building Automation Systems. Before today, had you heard of this program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

PA6 (IF PA2<>3 AND COSBL_ELIGIBLE=1) Another one of Xcel Energy's programs is called the Small Business Lighting program, which offers rebates and technical assistance to help small business customers upgrade lighting equipment in their facilities. Before today, had you heard of this program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

PA7 How did you learn about Xcel Energy's programs?

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 (BSC)
3 Another Xcel Energy staff member
4 Mailing from Xcel Energy in general (i.e., bill inserts, direct mailings)
5 From an equipment vendor or contractor
6 From a colleague or coworker at my company
7 Previous experience with an Xcel Energy program
8 Xcel Energy event
9 Xcel Energy website
10 Another online resource (not Xcel Energy's website)
11 A mass advertising campaign
12 Saw an article in a newspaper, magazine, or newsletter
13 Other (SPECIFY)
D DON'T KNOW
R REFUSED

PA8 (IF PA7 = 11) 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 (SPECIFY)
D DON'T KNOW
R REFUSED

PA9 You said that you received information from **[insert sources of information from PA7]**. 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

PA10 How would you prefer to receive information about assistance available through Xcel Energy's energy efficiency programs in the future? (DO NOT READ LIST, RECORD ALL THAT APPLY)

1 Through my account manager
2 Through a representative at the Business Solutions Center (BSC)
3 Another Xcel Energy staff member
4 Mailing from Xcel Energy in general (i.e., bill inserts, direct mailings)
5 From an equipment vendor or contractor
6 From a colleague or coworker at my company
7 Previous experience with an Xcel Energy program
8 Xcel Energy event
9 Xcel Energy website
10 Another online resource (not Xcel Energy's website)
11 A mass advertising campaign
12 Saw an article in a newspaper, magazine, or newsletter
13 E-mail
14 Text message
15 Other (SPECIFY)
D DON'T KNOW
R REFUSED

PA11 (IF STATE = MN) Another program available to smaller business customers is the Onestop Efficiency Shop program operated by the Center for Energy and the Environment, which offers rebates for lighting equipment as a complement to Xcel Energy's programs. Before this call, had you heard of this program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

PA12 (IF PA11 = 1) Has your organization ever participated in the Onestop Shop program? (RECORD ONE NUMBER)

1 Yes
2 No
D DON'T KNOW
R REFUSED

Installations of Energy Efficient Equipment

EE1 Xcel Energy offer rebates for various equipment and services. For each of the following can you tell me if you have implemented or considered implementing these within the past two years? Have you implemented or considered implementing…(READ, ROTATE LIST)

a. An automated control system that controls equipment such as HVAC and/or lighting (e.g., EMS, BAS)
b. Energy efficient lighting
c. Virtual desktop computers or PC power management software
d. Having an energy audit or assessment conducted

1 Have implemented within the past two years
2 Have considered but not yet implemented
3 No
D DON'T KNOW
R REFUSED

EE2 (ASK FOR ALL WHERE EE1=1) Did you implement this improvement through an Xcel Energy program or receive an Xcel Energy rebate?

1 Yes (SPECIFY: WHICH PROGRAM)
2 No
D DON'T KNOW
R REFUSED

EE3 What other actions other than the ones we just discussed, if any, has your business taken within the past two 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 Building envelope improvements such as insulation, window film, etc.
9 Recommissioning or retrocommissioning
10 Process improvements (manufacturing processes)
11 Installed high efficiency motors or drives
12 Installed high efficiency refrigeration equipment
13 Tuned up existing equipment
14 Other (SPECIFY)
D DON'T KNOW
R REFUSED

EE4 (ASK FOR ALL MENTIONED IN EE3) Did you implement this improvement through an Xcel Energy program or receive an Xcel Energy rebate?

1 Yes (SPECIFY: WHICH PROGRAM)
2 No
D DON'T KNOW
R REFUSED

EE5 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 Xcel Energy's energy efficiency rebate programs in the future?

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

EE6 (ASK IF EE5 < 7) What are the reasons why you wouldn't consider participating 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 amounts aren't high enough
5 Program is unclear/difficult to understand
6 Concerns from existing vendor about participating in the program
7 Do not want or need upgraded equipment
8 Low prioritization of energy efficiency or conservation in firm
9 None
10 Other (SPECIFY)
D DON'T KNOW
R REFUSED

EE7 (ASK IF EE7<> 6) What additional information, assistance, or clarification would you need in order to participate in Xcel Energy's energy efficiency rebate programs?

(RECORD RESPONSE)

Decision-Making Processes

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

I1 If you were considering implementing or installing new energy efficient equipment to save energy or money at your company, where would you look to or who would you contact for information? (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 General Internet search (e.g., Google search)
6 Contractor/vendor
7 Xcel Energy-sponsored event
8 Internal management staff
9 Internal facilities management staff
10 Social Media (e.g., Linked-In, Facebook, Twitter)
11 Other (SPECIFY)
D DON'T KNOW
R REFUSED

I2 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? (READ; ROTATE LIST)

___ Availability of a rebate
___ Recommendation of contractor or supplier
___ Compatibility with existing equipment
___ Initial purchase cost
___ Operating cost
___ Length of payback period (IF GT 5, What payback period do you strive for?)
___ Efficiency level of new equipment
___ Environmental concerns
___ Performance concerns
___ Capital investment or budget availability
___ Energy savings or reducing your energy bills
___ (READ LAST) some other consideration not already mentioned (SPECIFY)

I3 Does your company have any corporate policies related to energy efficiency standards or sustainability plans that you need to consider when purchasing new equipment or making improvements to this facility?

1 Yes
2 No
D DON’T KNOW
R REFUSED

I4 (IF I3 = 1) Which of the following best describes this policy? (READ LIST)

1 Purchase energy efficient equipment regardless of cost
2 Purchase energy efficient equipment if it meets payback or return on investment criteria
3 Purchase standard efficiency equipment that meet code
4 Something else (SPECIFY)
D DON’T KNOW
R REFUSED

I5 What are some of the major obstacles 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 of internal staff to implement
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

SA1 (IF PA1 = 1) 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". How satisfied are you with… (ROTATE LIST)

a. __ (0-10) The type of rebated equipment or improvements available through Xcel Energy's programs
b. __ (0-10) Requirements for project rebate eligibility
c. __ (0-10) The amount of the rebates offered for equipment or improvements
d. __ (0-10) The information you have received from Xcel Energy about their programs
e. __ (0-10) The level of technical support and information available to you, including technical assessments and studies?

SA2 (FOR EACH RATED < 5 IN SA1) Why do you say that?

(RECORD VERBATIM)

SA3 Thinking about Xcel Energy overall as your provider, using a 0-to-10 scale where 0 means "very dissatisfied" and 10 means "very satisfied", how would you rate your satisfaction with Xcel Energy?

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

Customer Profile

F1INTRO Finally, I'd like to ask you some questions about your business for classification purposes only.

F1 Which of the following best describes your organization? (READ LIST, SELECT ONE)

1 Local, state, or federal government institution
2 For-profit business
3 Non-profit business
4 Something else (SPECIFY)
D DON'T KNOW
R REFUSED

F2 What business activity accounts for most of the floor space covered by your Xcel Energy bill at **[ADDRESS]**? (DO NOT READ, ACCEPT ONE RESPONSE)

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
14 Agricultural
15 Vacant
16 Municipal/Governmental
17 Other (SPECIFY)
D DON'T KNOW
R REFUSED

F3 Do you own or 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 Is your facility at **[ADDRESS]** your company's only location, one of several in the region, or one of several across the nation?

1 Only location
2 One of several in region
3 One of several across the nation
D DON'T KNOW
R REFUSED

F5 Approximately how many full-time and part-time employees are employed by your business at **[ADDRESS]**?

1 Less than 10
2 10-49
3 50-99
4 100-249
5 250-499
6 500 or more
D DON'T KNOW
R REFUSED

F6 (IF MNEC_ELIGIBLE=1 AND EE1a<>1) Does your facility have a centralized building automation or energy management system that controls energy-using equipment such as HVAC or lighting?

1 Yes
2 No
D DON'T KNOW

F7 (IF EE1a=1 OR F6=1) [IF EE1a=1 SHOW: “Earlier you mentioned that you recently installed an automated controls system in your facility.”] What types of equipment is controlled by your automated control system? (READ, SELECT ALL THAT APPLY)

1 Heating
2 Cooling
3 Ventilation
4 Lighting
5 Other (SPECIFY)
D DON’T KNOW

F7a Are these controls integrated into a building automation or energy management system?

1 Yes
2 No
D DON’T KNOW

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

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?

1 Yes (SPECIFY)
2 No

APPENDIX D: NONPARTICIPANT CUSTOMER SURVEY RESPONSE RATE

Table D-1. Colorado Nonparticipant Customer Phone Survey Response Rate

Sample Disposition	Count
Starting Sample	**430**
Ineligible – nobody knowledgeable	16
Refusal	50
Incompletes (partial surveys)	24
Language barrier	5
Bad number	39
Attempted but not completed[1]	221
Completed Surveys	**75**
Response Rate (Completed Surveys / Starting Sample)	**17.4%**

[1] Average number of attempts: 3.8

APPENDIX E: TRADE PARTNER INTERVIEW GUIDE

This topic guide was used for semi-structured interviews with participating trade partners and to support the evaluation of the Computer Efficiency program.

Interviews were conducted by senior staff and were semi-structured. This guide served to offer consistent direction to ensure certain topics are covered, but evaluators followed the flow of the interview and modified questions as needed to fit the interviewee's circumstance. As a result, not all questions were asked of all interviewees and interviews may have explored other topics.

Introduction

My name is _____, with Tetra Tech. Xcel Energy has hired us to evaluate its Computer Efficiency program, which is implemented by Ecova. We understand that as part of this program you have been working with Ecova and installing high efficiency power supplies to receive incentives and I would like to ask you some questions about your experience.

Your feedback on the program is extremely valuable as Xcel Energy wants to improve your experience and satisfaction with the program. This interview should take approximately 30 minutes of your time. May we take some time now to do the interview? (If no, when would be a convenient time?)

Before we begin, is it okay if I record our call?

Company Profile

Research company website before interview to learn about company offerings. Key highlights:

Table quantities will be pulled from manufacturer sales data to populate Sales Trend and NTG tables.

Program Awareness and Involvement

A1 Could you please provide a brief overview of your involvement with the Xcel Energy Computer Efficiency program or Ecova? How many staff are involved with the program?

A2 **When** did you first get involved with program? **Why** did you decide to participate/get involved in the program? What do you see as the value of the program for you?

A3 How well would you say you understand, or how familiar are you with, Xcel Energy's Computer Efficiency program? Are there any aspects of the program that are unclear to you?

A4 Please describe the contracting process with Ecova. Do you feel there are adequate program communications? Are any changes needed? Did you have any concerns with any of the contracting requirements?

A5 How does the distribution chain work for these incentivized power supplies in PCs? Who do you interact with? Are the PCs all sold through distributors? Are any sold directly to customers? Are there other methods?

A6 How do you leverage the Computer Efficiency program for your business, if at all? Do you pass the savings on to the customer, channel that into marketing and promotional funding, or use it for something else?

A7 Is there any specific messaging to customers about the energy efficient power supplies? What do you tell customers?

A8 In general, who (title/position) within the customer's organization do you work with regarding PC sales? What information do you need to provide for them (e.g., cost, timeframe, equipment descriptions)?

PC Sales Trends

Power Supply Efficiency Level	Rebates Levels	Quantity 2012	Quantity 2013	Quantity 2014	Quantity 2015	Quantity 2016
Bronze	$5					
Silver	$10					
Gold	$15					
Platinum	$20					

S1 What has been the trend in PC sales and efficiency levels over the past 5 years? What is the lowest efficiency power supply available (or baseline efficiency) (how have the watt ratings changed)? What are sales levels associated with the "low" efficiency models?

S2 Based on the incentives you have received, it appears that you primarily install (_____) and (_____) efficiency levels through the program. Can you explain a little about why that is the case? Does it vary by geography (CO vs MN)?

DEPENDING ON COUNTS, PROBE: Why Bronze only? Why no Silver, but Gold or Platinum?

S3 (If relevant based on counts) Over the years your company has been receiving incentives through the program it appears that your installations have shifted from (_____) to (_____). Can you explain more about what caused that shift? Does it vary by geography (CO vs MN)?

PROBE: Why has Gold decreased? Why no Silver, but Gold or Platinum?

S4 What has been the effect of Xcel's Computer Efficiency program on the market? Since the program began, would you say that your sales/installations of more efficient power supplies have increased: significantly, somewhat, a little, hardly at all?

S5 How has the Xcel Energy program impacted the efficiency levels available to all customers? Does that apply only to Xcel's territories in CO and MN, or has it also impacted other geographies? If so, which ones?

S6 How do you expect the trend in PC sales and efficiency levels will change over the next 5 years? Do you feel that tablets are more often replacing PC or laptops (in what proportions)? Are there any sales data to support that perspective?

S7 What role do you see the program playing in the market for energy efficient equipment and services going forward? What other types of energy efficient equipment could the program incentivize that currently are not eligible?

Net-to-Gross Battery (Upstream Manufacturers)

Now let's focus specifically on sales for 2015. According to program records, the high efficiency power supplies you sold that received an incentive through Xcel Energy's Computer Efficiency program in 2015 covered a variety of efficiency levels. (SEE TABLE)

Efficiency Level [EE_MEAS]	Rebates Levels [REBATE]	Count sold in 2015
Bronze qualifying power supplies	$5	
Silver qualifying power supplies	$10	
Gold qualifying power supplies	$15	
Platinum qualifying power supplies	$20	

NTG1 Now I'm going to ask you about the effect of the Xcel Energy/Ecova program discounts on your installation of Bronze level qualifying power supplies**.** In 2015, the rebate was $5 per Bronze level power supply**.** If these incentives had not been available, do you think your installation of these Bronze level power supplies in 2015 would have been about the same, lower, or higher?

1 About the same
2 Lower
3 Higher
4 Don't know
5 Refused

NTG2 [IF NTG1 = LOWER] By what percentage do you estimate your installation of the Bronze level power supplies would have been lower during 2015 if the Xcel Energy incentive of $5 per Bronze level power supply was not available?

RECORD PERCENTAGE = _____%
D Don't know
R Refused

NTG3 [IF NTG2 = DK OR REF] Can you try to estimate a percentage range? For example, 10% to 25% or 50% to 75%.

RECORD PERCENTAGE RANGE = _____%
D Don't know
R Refused

NTG4 [IF NTG1 = LOWER] I want to make sure I understand you correctly when you say your installation of Bronze level power supplies would be [NTG2 OR NTG3 % = ____] lower without the program incentive. So you're saying that if you installed 100 Bronze level power supplies in a given week with the program incentive, you would have only installed [100 - (NTG2 OR NTG3 % x 100)] that week without the program incentive. Is this correct? [IF RESPONSE ≠ YES THEN CLARIFY RESPONSE TO NTG2 OR NTG3]

1 Yes
2 No
3 Don't know
4 Refused

NTG5 Please explain why you think your installations of Bronze level power supplies would be [the same/lower/higher] in the absence of the Xcel Energy incentive?

(RECORD RESPONSE)
97 Don't know
98 Refused

NTG6 I also see that your company received program incentives for installing **[EE_MEAS]** through the program. Would your responses to the previous question(s) be different or the same if they were asked for the **[EE_MEAS]**?

NTG7 Do you install and sell these Bronze to Platinum power supplies in areas where you do not receive an incentive from Xcel Energy through Ecova? Which geographies? Do you receive any other type of incentive for these?

NTG8 How do those installations and sales compare proportionally to what you install in Xcel's territories? For example, 10%, 25%, similar amount, double?

NTG9 Why are you installing the same type of high efficiency power supplies without the incentives?

1 The equipment is more reliable
2 Customers are demanding it
3 Our competitors are offering it
4 We have adopted as best practice as a business
5 Other (specify)

Wrap-Up

W1 What do you think is working best in Xcel Energy's program? What do you think is most in need of improvement?

W2 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? (Why are you satisfied / How could your satisfaction be increased?)

W3 Is there anything else that you would like to share concerning the program?

Thank you very much for your time. Those are all the questions I had for you today.

Would it be alright for me to contact you if I have any additional questions?

APPENDIX F: INFLUENTIAL VENDOR SURVEY INSTRUMENT

This questionnaire was used for vendors whose recommendations were identified by participating customers as being influential in their decision to install program qualifying equipment.

Sample Variables

The following fills will be used throughout the survey. These fills are program and measure specific.

<PROGRAM> Program name

1 Lighting Efficiency Program
2 Small Business Lighting Program
3 Efficiency Controls Program
4 Computer Efficiency

[YEAR] Year of customer participation

[MEASTYPE] Generic product description (examples listed below)

1	lighting equipment	(IF PROGRAM = 1 OR 2)
2	controls systems	(IF PROGRAM = 3)
3	computing equipment	(IF PROGRAM = 4)

[EE_MEAS] Prioritized high efficiency measure category implemented (for use inside free-ridership section) (examples listed below)

1 aerators
2 aerators and LED lamps
3 compact fluorescent lamps
4 energy efficient lighting (custom projects)
5 energy efficient fluorescent lamps
6 LED lamps
7 occupancy sensors
8 efficient controls systems
9 virtual desktops (PROGRAM = 4)
10 PC power management software (PROGRAM = 4)

[CUST_ADDR] Address, city, state, and zip where measure implemented

[CONTACT] Vendor contact name

[CUST_NAME]Participant company name who identified vendor as being influential in decision-making process

[CASEID] Case's unique identification code

[MULTFLAG] Flag indicating that case is part of a multiple

[MULTID] Multiple's identification code

Introduction

INT01 Hello, my name is _____, and I'm calling on behalf of Xcel Energy regarding equipment your firm sold or services you provided that qualified for Xcel Energy's **<PROGRAM>**. May I speak with **<CONTACT>**?

[IF NO VENDOR CONTACT NAME] May I speak with the person who would be most knowledgeable about your firm's involvement with Xcel Energy's **<PROGRAM>**?

1 Yes
2 No, R not knowledgeable [SKIP TO OTHER_R]

MULTCHK [ASK IF MULTFLAG=1] [INTERVIEWER QUESTION: Is this the first case of a multiple?]

1 Yes; first case [SKIP TO PREAMBLE]
2 No; subsequent case [SKIP TO V1]

PREAMBLE I'm with Tetra Tech, an independent research firm. I am calling to learn about your experiences with the efficient equipment you sold or services you provided, where a rebate was issued to the customer through Xcel Energy's **<PROGRAM>**.

I'm not selling anything; I'd just like to ask your opinion about this program. I'd like to 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.

1 Continue [SKIP TO C1]

FAQ [READ AS NEEDED]
(Who is doing this study: Xcel Energy has hired our firm to evaluate the program. As part of the evaluation, we're talking with contractors that sold equipment through the program to understand their 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 the efficient equipment you sold through the program. Your responses will be kept confidential. If you would like to talk with someone from Xcel Energy about this study, feel free to call Nick Minderman at (612) 330-6362.)

Identification of Decision-Maker

C1 Our records indicate that you sold or installed **<EE_MEAS>** that qualified for a rebate through Xcel Energy's **<PROGRAM>** in **[YEAR]** to **<CUST_BUS_NAM>**. Is this correct?

01 Yes [SKIP TO C4]
02 Yes, we sold/installed **<EE_MEAS>** through the program, but some other information is incorrect *(SPECIFY WHAT IS INCORRECT)* [SKIP TO C4]
03 No, we did not sell **<EE_MEAS>** through the program [SKIP TO OTHER_R]
88 Don't know [SKIP TO OTHER_R]

OTHER_R Is it possible that someone else at your firm would be more knowledgeable about this sale or installation through the **<PROGRAM>**?

01	Yes	
02	No	*(TERMINATE 81)*
88	Don't know	*(TERMINATE 81)*
99	Refused	*(TERMINATE 91)*

AVAILABLE_R May I please speak with that person?

01	Yes	*(BEGIN THE SURVEY AGAIN WITH NEW R SKIP TO INT01)*
02	Yes, but R is currently unavailable	*(SCHEDULE CALLBACK)*
03	No	*(TERMINATE 91)*
88	Don't know	*(TERMINATE 81)*
99	Refused	*(TERMINATE 91)*

C4 **<CUST_BUS_NAM>** indicated that you were influential in their decision to purchase this efficient equipment through the program. Now just to confirm, are you the person most knowledgeable about this customer's decision to purchase or install this **<EE_MEAS>** through the **<PROGRAM>**?

01	Yes	
02	No	*(SKIP BACK TO OTHER_R)*
88	Don't know	*(SKIP BACK TO OTHER_R)*
99	Refused	*(TERMINATE 91)*

C5 Was there anyone else at your company was involved with discussing options with this customer?

01	No one else
02	Yes (SPECIFY: Can I get their names?)
88	Don't know
99	Refused

Source of Program Awareness

[IF MULTCHK=2 SKIP TO V1]

P1 How did you FIRST learn about the **<PROGRAM>**? (DO NOT READ LIST)

01	Print Advertising—newspaper, trade journal	
02	Electronic or online ad – such as Google	
03	Direct mail	
04	Xcel Energy email newsletter (e.g., Energy Exchange newsletter)	
05	Xcel Energy Website	
06	Discussion with Xcel Energy account representative	
07	Discussion with Xcel Energy program staff	
08	Xcel Energy technical assistance study	
09	Xcel Energy training/seminar	
10	From another program; e.g., on-site assessment/audit program (SPECIFY)	
11	Other utility information (SPECIFY)	
12	Other Vendor	
13	Trade partner from Xcel Energy	
14	Manufacturer's rep	
15	trade show	
16	Contractors Association	
17	Energy Efficiency Expo/Customer Fair	
18	Other training seminar	
19	Customer	
20	Other (SPECIFY)	
88	Don't know	(SKIP TO V1)
99	Refused	(SKIP TO V1)

P2 Did you hear about the program from any other sources? [SELECT ALL THAT APPLY]

01 Print Advertising—newspaper, trade journal
02 Electronic or online ad – such as Google
03 Direct mail
04 Xcel Energy email newsletter (e.g., Energy Exchange newsletter)
05 Xcel Energy Website
06 Discussion with Xcel Energy account representative
07 Discussion with Xcel Energy program staff
08 Xcel Energy technical assistance study
09 Xcel Energy training/seminar
10 From another program; e.g., on-site assessment/audit program (SPECIFY)
11 Other utility information (SPECIFY)
12 Other Vendor (SPECIFY)
13 Trade partner from Xcel Energy
14 Manufacturer's rep
15 Trade show
16 Contractors Association
17 Energy Efficiency Expo/Customer Fair
18 Other training seminar
19 Customer
20 Other (SPECIFY)
21 No other sources
88 Don't know
99 Refused

Free-ridership

V1 I'm going to ask you to rate the importance of the **<PROGRAM>** in influencing your decision to recommend this specific **<EE_MEAS>** to **<CUST_BUS_NAM>** at **[CUST_ADDR]**.

Using a 0 to 10 scale where 0 is 'Not at all important" and 10 is "Very Important", how important was the **<PROGRAM>**, including incentives as well as program services, events, and information from Xcel Energy, in influencing your decision to recommend that **<CUST_BUS_NAM>** purchase or install this specific **<EE_MEAS>** at this time?

_ (0-10)
88 Don't know
99 Refused

V2 And using a 0 to 10 likelihood scale, where 0 is “not at all likely” and 10 is “very likely,” what is the likelihood that you would have recommended this specific **<EE_MEAS>** to **<CUST_BUS_NAM>** if the **<PROGRAM>**, including incentives as well as program services, events, and information from Xcel Energy, had not been available?

_ (0-10)
88 Don't know
99 Refused

MeasCHK [ASK IF MULTCHK = 2]
[INTERVIEWER QUESTION: Is this case’s <EE_MEAS> variable the same as a previous case’s <EE_MEAS> variable?]

01 Yes, Duplicate measure	[SPECIFY RECORD # OF WHICH CASE YOU’RE DUPLICATING]
	[SKIP TO INT99]
02 No, New measure	[SKIP TO V3]

V3 Now, using a 0 to 100 percent scale, in what percent of [IF PROGRAM=1,2 "your lighting" ELSE "total design or"] sales situations do you recommend **<EE_MEAS>** before you learned about the **<PROGRAM>**?

_ (0-100)
888 Don't know
999 Refused

V4 And using the same 0 to 100 percent scale, in what percent of [IF PROGRAM = 1 or 2 SHOW your lighting ELSE total design or] sales situations do you recommend **<EE_MEAS>** now that you have worked with the **<PROGRAM>**?

_ (0-100)
88 Don't know
99 Refused

V5 Now, using a 0 to 10 scale where 0 is “Not at all important” and 10 is “Very important”, how important in your recommendations was. . .?

a. The technical support provided by Xcel Energy?
b. The information provided by Xcel Energy representatives?
c. The training seminars provided by Xcel Energy?
d. The information provided by the Xcel Energy website?
e. Your firm’s past participation in a rebate or audit program sponsored by Xcel Energy?
f. The program incentive provided by Xcel Energy?

__ 0-10 Scale
77 Not applicable
88 Don't know
99 Refused

V5_OTH In what other ways have your recommendations regarding **<EE_MEAS>** been influenced?

(RECORD VERBATIM)

Nonparticipant Spillover

MeasTypeCHK [ASK IF MULTCHK = 2]

[All multiples have uniform MEASTYPE. Therefore if SKIP TO INT99 IF MULTCHK=2]

[INTERVIEWER QUESTION: Is this case’s <MEASTYPE> variable the same as a previous case’s <MEASTYPE> variable?

01Yes; Duplicate measure type [SPECIFY RECORD # OF WHICH CASE YOU’RE DUPLICATING] [SKIP TO INT99]

02 No; New measure type

VNP2 Please think about all the program-eligible **<MEASTYPE>** you specified, sold and/or installed for Xcel Energy customers since the beginning of 2015.
Did you specify, sell, and/or install any of this program-eligible **<MEASTYPE>** to customers of Xcel Energy <u>without</u> the customer receiving an incentive through an Xcel Energy program?

01	Yes	
02	No	(SKIP TO MT1)
88	Don't know	(SKIP TO MT1)
99	Refused	(SKIP TO MT1)

VNP3 Approximately what percent of all of this program-eligible **<MEASTYPE>** you specified, sold and/or installed for Xcel Energy customers did not receive an incentive through an Xcel Energy program?

___%
888 Don't know
999 Refused

VNP4 What are the main reasons why your firm did not request a customer incentive for this energy saving equipment you specified and/or installed?
(DO NOT READ—INDICATE ALL THAT APPLY; PROBE, WHAT ELSE?)

01 Not worth the paperwork for us to help the customer apply for the incentive
02 Not enough time or staff resources to complete the paperwork
03 Customer did not want the hassle of applying for the incentive
04 Takes too long for approval
05 Reached the maximum amount I could install through the program
06 The equipment would not qualify→ [Why not? (SPECIFY)]
07 Vendor does not participate in program
08 No time – needed equipment immediately
09 Thought the program ended
10 Didn't know the equipment qualified under another program
11 Just didn't think of it
12 Unable to get rebate (unsure why)
13 Other (SPECIFY)
88 Don't know
99 Refused

VNP5 I'm going to read you 3 statements. For each statement, please tell me whether you agree or disagree that this statement applies to your company. There are no right or wrong answers; we just want your honest opinion.

Our past experience specifying or installing energy efficient **<MEASTYPE>** through energy efficiency programs has convinced us that this equipment is cost effective or beneficial even without a program incentive.

01 Agree
02 Disagree
88 Don't know
99 Refused

VNP6 We are better able to identify opportunities to improve energy efficiency by using energy efficient **<MEASTYPE>** because of our previous experience installing energy this equipment through energy efficiency programs and what we learned through working with Xcel Energy.

01 Agree
02 Disagree
88 Don't know
99 Refused

VNP7 We are more likely to discuss energy efficient options with all of our customers when developing project plans because of our previous experience installing energy efficient **<MEASTYPE>** through energy efficiency programs and what we learned through working with Xcel Energy.

01 Agree
02 Disagree
88 Don't know
99 Refused

VNP8 Please describe what impact, if any, the **<PROGRAM>** had on your decision to specify or install energy efficient **<MEASTYPE>** outside of the program.

(RECORD RESPONSE VERBATIM)

Market Transformation Indicators

[IF MULTCHK=2 SKIP TO INT99]

MT1 Prior to participating in the Xcel Energy program, in what percentage of your commercial projects did you specify, sell, or install program-qualifying **<MEASTYPE>**?

___ ENTER PERCENTAGE
888 Don't know
999 Refused

MT2 And since participating in the Xcel Energy program, in what percentage of your commercial projects did you specify, sell, and/or install program-qualifying **<MEASTYPE>**?

___ ENTER PERCENTAGE
888 Don't know
999 Refused

MT3 Do you also sell energy efficient **<MEASTYPE>** in areas where customers do not have access to Xcel Energy incentives?

01	Yes	
02	No	(SKIP TO MT7)
88	Don't know	(SKIP TO MT7)
99	Refused	(SKIP TO MT7)

MT4 Do you promote energy efficient **<MEASTYPE>** equally in areas with and without Xcel Energy incentives?

01	Yes
02	No
88	Don't know
99	Refused

MT5 About what percent of your sales of **<MEASTYPE>** are <u>not</u> in Xcel Energy's territory?

_	(0-100)
88	Don't know
99	Refused

MT6 And approximately what percentage of your sales of **<MEASTYPE>** outside Xcel Energy's territory would qualify for incentives if they were sold in Xcel Energy's service territory?

_	(0-100)
88	Don't know
99	Refused

MT7 Has the availability of energy efficient **<MEASTYPE>** to customers increased, decreased, or stayed about the same since you began selling the equipment through the **<PROGRAM>**?

01	Increased
02	Decrease
03	Stayed about the same
88	Don't know
99	Refused

MT8 In the next 2 years, do you expect the importance of **<PROGRAM>** to increase, decrease, or stay about the same in influencing your recommendations of energy efficient **<MEASTYPE>**?

01 Increase
02 Decrease
03 Stay about the same
88 Don't know
99 Refused

Vendor Characteristics

[IF MULTCHK=2 SKIP TO INT99]

A1 Just for classification purposes, approximately how many of the following work at this location?

a. __ Full-time
b. __ Part-time
c. __ Seasonal
8888 Don't know
9999 Refused

A2 Finally, I want to let you know that the information we have collected during this interview will be used in aggregate form to provide overall reports and conclusions. However, some of your individual responses could help Xcel Energy understand your particular circumstances. 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?

01 Yes
02 No

A3 As part of our evaluation we may need to follow-up on some of this information. Would it be alright if someone from Tetra Tech called you if needed?

01 Yes
02 No

INT99 [IF MultCHK=2 SHOW: "[INTERVIEWER, If R has more surveys to complete read: Now I'd like to ask you a smaller selection of questions about another location we have on record for your firm." OTHERWISE READ:] "Those are all the questions I have. I'd like to thank you for your help with this survey."

APPENDIX G: BENCHMARKING INTERVIEW GUIDE

The following topic guide was used for semi-structured interviews with program managers of peer-utility programs including in the benchmarking research.

This guide served to offer consistent direction. However, interviews were tailored based on the specific program designs, secondary research findings, and the roles and responsibilities of each interviewee. As a result, not all questions were asked of all interviewees and interviews may have explored other topics not included in this guide.

Introduction

Hello, my name is _____ with Tetra Tech/NMR. We are working with Xcel Energy to compare its [PROGRAM] with other similar programs offered across the country in an effort to improve their energy efficiency program offerings to customers.

[Provide a brief description of Xcel Energy's program, the purpose of the benchmarking study, and the program/measures that we're interested in learning more about.]

[Offer to share a summary of study findings with the peer program manager as motivation to participate. If agreed upon, interviewee must provide requested information at the end of this interview guide to share study results.]

Before we begin, is it okay if I record our call?

Program Background

1) First, could you briefly describe your roles and responsibilities for the organization/program?

2) How long has the program been offered?

   a) How long have you been involved with this program?

3) Is the program delivered internally or by a third-party implementer? (if 3rd party – who?)

4) What types of internal staff are used to administer the program? What are the roles of each of these types of staff?

5) How do *[Xcel Energy's measure offerings]* fit into your program portfolio? Are they handled as a stand-alone program or incorporated into other programs (such as custom) or delivery mechanisms?

6) Is the program offered year-round or only during specific months? If not year-round, for which months? Why not offered year-round?

Program Scope and Goals

1) What are your program's goals (spending, participation, energy savings, cost-effectiveness)?
   a) How are your program goals set and by whom? Are they annual goals or multi-year goals? Are they a subset of some long range plan (integrated resource plan)?

   b) Are goals set at the measure level, program level, segment (business, residential, low-income), or portfolio level? (Probe for each type of goal)
      i. Participation goals
      ii. Energy savings
      iii. Cost-effectiveness

   c) Are there goals or objectives for the program in addition to participation and savings goals (reaching specific segments, meeting regulatory requirement, etc.)?

   d) (If utility/program has segment-specific goals) Do you have any savings or spending mandates for specific segments (e.g., low-income)?

2) Do any of the program offerings overlap with other programs in your business portfolio? If so, how does this affect your program goals? (Probe for why measures are part of a larger program or separate)

3) How does the program fit within your overall portfolio goals? How much of your overall portfolio energy savings is contributed by the program?
   a) Has your program's contribution to the overall plan changed since its inception? How so? Why?

4) Overall, how effective has your program been in achieving these goals and objectives (Probe for actual or estimated savings, cost-effectiveness)?

   a) Are there ways you think the program could be more effective in achieving its goals?

   b) What is your cost effectiveness for the program?

Measures and Incentives

1) What types of measures are offered by your program (Probe for similarities and *differences to Xcel Energy's program, including custom vs. prescriptive and downstream vs. mid/upstream)?*

   a) Of those measures, which comprise the bulk of the program participation in terms of participation 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) Does your program offer a midstream or upstream incentive for distributors/manufacturers? If so, what types of lighting measures are offered? What

type of customer data do you require from distributors for each sale? Has the midstream program to be successful – why or why not?

2) How are the incentive levels for your measure offerings determined? *(If needed: are they based on estimated incremental costs and/or other factors? Custom vs. prescriptive incentives?)*

   a) What are your current rebate levels? Do rebate levels changes at any points throughout the year (e.g., rebate bonuses)?

   b) What percentage of the customer's project costs do you fund? Is there a cap (probe for caps with and without bonuses if offered)?

   c) *(If custom incentives offered)* Do you have any payback period, caps to rebate amounts, incremental cost thresholds, or cost-effectiveness criteria for rebate approval?

3) Have incentive levels changed over time? If yes…

   a) How have they changed?

   b) Why did you make these changes?

4) What documentation or approvals are required to receive a rebate?

   a) Is preapproval required? If yes, under what circumstances would a rebate be denied for a project or customer that was initially pre-approved?

   b) Have you had any problems obtaining correctly completed documentation from customers or trade partners? If yes, what problems have you had and what steps have you taken to address them?

Marketing and Recruitment

1) What are your customer eligibility requirements for the program?

2) What is your target market for the program? How do you identify potential candidates? What are your top segments?

3) What is the process for recruiting customers for the program, and who does this?

   a) Do account managers have any outreach or recruitment goals for the program? How are those tracked?

   b) Do you use any outside contractors or implementers for customer recruitment or providing other services to customers related to the program? *(Note we are not talking about trade partners here; will investigate role of trade partners later in interview)*

   c) What types of customer marketing efforts do you use? What is the relative success of different marketing activities?

   d) How do you identify IT staff within businesses?

4) Are customers able to implement eligible projects through any of your other programs?

   a) What factors go into customers choosing one program over another?

   b) How does this affect your marketing strategy, both at the program and portfolio level (Probe how they avoid 'competing' with their other program offerings)?

   c) How does this affect setting program-level participation and energy savings goals?

5) What are the major barriers to participation?

   a) Do these vary by customer types (or segments)?

   b) What strategies have you used to overcome these barriers? How effective have these strategies been?

6) Do you offer online or digital rebate applications for the program? If yes…

   a) Do you know what proportion of applications come in digitally versus on paper?

Trade partner Outreach

1) How does the program leverage the trade partner market infrastructure? *(Probe about different market actors within the supply chain)*

2) What types of trade partners typically participate in the program (e.g., study providers, installation contractors, distributors, ESCOs, engineering consultants, etc.)?

   a) What roles do these trades play in the delivery of program?

3) What types of information, training, or support do you provide to trade partners?

4) Do trade partners receive incentives from your program?

   a) (*If yes*) What are the incentive levels, and what is required of the trade partners to get them?

   b) *(If no)* Have you ever offered these incentives? (If yes) Why did you eliminate the incentives?

Program Impacts

1) How is program participation tracked?

   a) (IF UPSTREAM OR MIDSTREAM) How do you verify that midstream/upstream measures are sold to customers of your utility?

   b) (IF UPSTREAM OR MIDSTREAM) Are individual customers that purchase midstream/upstream measures tracked, or just overall sales?

2) Do you use any net-to-gross or spillover calculations for the program?

   a) At what level (e.g., measure, program, portfolio level)?

b) How were those estimates derived, and what are the results? Can we see a copy of the study?

3) How are you seeing the market transform through your customers and trade partners?

a) What influence do you think the program had on these market changes? Why do you say that?

b) How has the program adapted to these market changes to sustain impacts?

Lessons Learned and Program Outlook

1) What are the key lessons you have learned from your experiences administering the program?

2) What do you see as future opportunities and/or challenges for the program?

3) Do you have any specific growth strategies you are pursuing in your market? (Probe: measure offerings, customer market segments)?

Wrap-Up

1) Are there any other topics that we have not covered in this interview that we should be aware of?

2) Do you have any program documentation (e.g., program filings/plans, status reports, FAQ sheets, evaluation results) that you would be willing to share with us?

Verify name, title, and email address for receiving the summary of study findings (if desired).

Name: _____

Title: _____

Email: _____

APPENDIX H: MARKET EFFECTS RESEARCH RECOMMENDATIONS

This appendix overviews the current industry thinking regarding market transformation resulting from utility demand side management programs and presents recommendations for assessing and monitoring market effects from Xcel Energy's programs in future evaluation research.

I1. INTRODUCTION

Demand side management (DSM) programs often include market transformation goals. Market transformation goals seek to overcome significant barriers to the adoption of energy efficient equipment or practices in the market place through coordinating tactics such as education, training, product demonstration, marketing, rebates, and other financial incentives. Examples of barriers include market actor and consumer 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.

A 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 suggest focusing on measuring market effects—as leading indicators of market transformation—as opposed to the larger task of measuring market transformation. Market effects are defined as "spillover savings that reflect significant program-induced changes in the structure or functioning of energy efficiency markets." [41] While the market effects indicators will vary depending on the nature of the market and the product or service or program, some are nearly always applicable: market share for energy-efficient products and services, the saturation of such products or prevalence of services; the price of energy-efficient products or services compared to less efficient alternatives; their availability; market actors' perceptions, knowledge, and possibly awareness of the products or services; and, ultimately, net energy and demand savings.[42] These are all indirect indicators that can help build up a preponderance of evidence to make the case that the market has changed because of program activity.

[41] Prahl, R., Ridge, R., Hall, N. and W. Saxonis. 2013. "The Estimation of Spillover: EM&V's Orphan Gets a Home." In Proceedings of the 2013 International Energy Program Evaluation Conference. Chicago, August 13-15. Accessed November 11, 2014 from http://www.iepec.org/conf-docs/conf-by-year/2013-Chicago/095.pdf.

[42] NMR Group, Inc., 2013. "A Review of Effective Practices for the Planning, Design, Implementation, and Evaluation of Market Transformation Efforts", CALMAC Study ID PGE0330.01, prepared for Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, Southern California Gas. http://www.calmac.org/publications/FINAL_NMR_MT_Practices_Report_20131125.pdf.

I2. MARKET EFFECTS RESEARCH

While a number of evaluation studies have been conducted in recent years to estimate market effects, most of these efforts have not estimated *net* energy market effects, or effects attributable to programmatic activities. 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. Two major limitations are that these studies, which employ the highest levels of rigor, are expensive and take place over a long period of time. 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, and they have funded a series of multi-staged market effects studies (available on www.calmac.org). In 2013, NMR conducted a literature review to identify and summarize effective practices in support of market transformation from both programs and the literature for consideration by the California investor-owned utilities.[43] In this review, NMR identified the following effective planning, design, implementation, and evaluation practices in support of market transformation program approaches, which illustrate the cost and time needed for these types of studies.

1. Identify target markets
2. Characterize the market
3. Identify the baseline and ensure ample savings are possible
4. Develop a market model
5. Develop program theory and logic model and match program theory to market characterization
6. Develop a market transformation story
7. Establish interim and long-term indicators of market effects
8. Articulate an exit or transition strategy for when transformation is complete
9. Continue to measure and monitor key market indicators after transition
10. Work with markets by doing the following:

    - Recognize and use market forces
    - Find market allies who are willing to work with the program
    - Promote competition
    - Share risks with other market actors
    - Use upstream market actors to influence downstream adoption of energy-efficient products and services

[43] Ibid. NMR Group, Inc., 2013. “A Review of Effective Practices for the Planning, Design, Implementation, and Evaluation of Market Transformation Efforts”, CALMAC Study ID PGE0330.01, prepared for Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, Southern California Gas. http://www.calmac.org/publications/FINAL_NMR_MT_Practices_Report_20131125.pdf.

11. Identify and promote non-energy benefits to the product or service
12. Leverage resource acquisition tools or programs
13. Take the innovation adoption curve into account:
    - Focus on early adopters in opening markets for innovative products, including energy-efficient products
    - Avoid the "chasm" between adoptions by innovators and the general public
14. Form a market-based advisory group to help shape and review the program

In their literature review, NMR also stated that effective program evaluation includes the following practices:

1. Match the evaluation strategy to the program logic
2. Track indicators tied to expected outcomes
3. Perform regular, ongoing research into the status of the market
4. Assess market effects periodically
5. Refine the program theory and logic model

The Massachusetts Program Administrators have also pursued a limited number of market effects studies—including the 2010 market effects study of C&I High Bay Lighting,[44] the ongoing Market Effects Baseline study for LEDs, the Residential New Construction Net Impacts Study,[45] and the Statistical Analyses of Penetration of ENERGY STAR-compliant Appliances.[46]

In both California and Massachusetts, Program Administrators are tasked with developing Market Transformation Indicators (MTI) by which to measure the outcomes if they cannot be measured directly, establishing baseline measurements for each indicator, and conducting periodic research to track progress toward the outcomes.[47]

I3. MARKET EFFECTS INDICATORS FROM COMPUTER EFFICIENCY PROGRAM EVALUATION ACTIVITIES

The 2016 evaluation of the Computer Efficiency program included interviews with program staff, trade partners and other market actors, downstream participating customers, nonparticipating customers, upstream participating manufacturers, and one influential vendor identified by a customer as being influential in their decision-making process. Each of these data collection efforts included questions to explore barriers and market transformation

[44] KEMA 2014, *HBL Market Effects Study,* http://ma-eeac.org/wordpress/wp-content/uploads/High-Bay-Lighting-Market-Effects-Study-Final-Report.pdf.

[45] NMR 2014, *Massachusetts New Construction Net Impacts Report, http://ma-eeac.org/wordpress/wp-content/uploads/Residential-New-Construction-Net-Impacts-Report-1-27-14.pdf.*

[46] Summarized in Wilson-Wright *et al.,* 2005 "Front-loading Marketing: Assessing Cumulative Effects of ENERGY STAR® Appliance Promotions on State-by-State Market Penetration Levels," http://www.iepec.org/conf-docs/papers/2005PapersTOC/papers/079.pdf.

[47] NMR Group, Inc., 2013. "A Review of Effective Practices for the Planning, Design, Implementation, and Evaluation of Market Transformation Efforts", CALMAC Study ID PGE0330.01, prepared for Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, Southern California Gas.

indicators. The evaluation also incorporated market research conducted earlier this year by Ecova to understand the current market for program-eligible equipment in the upstream component of the program, which accounts for most of the program savings.

For the upstream component of the Computer Efficiency program, the evaluation found limited evidence of lasting market transformation for efficient power supplies above the bronze level among national manufacturers. In fact, a review of the annual incentive data from 2012 to 2015 confirms that sales levels of gold and platinum efficiency power supplies have not been sustained over time as sales have slipped back to bronze even with the program. While bronze efficiency has become more common for these national manufacturers indicating lower program attribution, feedback from the one regional manufacturer in Minnesota still indicates high program attribution at the regional level. This manufacturer feels that their sales of bronze equipment would drop to zero percent in six months without the program.

For the downstream component of the program, while qualitative evidence shows program attribution is low (all four participants heard of the program after making their purchase decision), program awareness and interest among nonparticipating customers, and awareness among PC power management and virtual desktop vendors is also low, demonstrating few indications of market effects or market transformation.

Upstream Incentives

For the upstream component of the program, the EPA estimates that approximately 60 percent of desktops sold are not ENERGY STAR certified. Among three of the participating trade partners, market research conducted by Ecova indicates that approximately 20 percent of their sales of desktops continue to be non-80 PLUS power supplies, with very little sales for 80 PLUS above the Bronze level. Participating manufacturers said the incentive plays a key role in their ability to communicate the benefits of 80 plus computers and increase marketing of ENERGY STAR certified computers to commercial customers who are not focused on the efficiency of desktops.

Those participating manufacturers selling gold and platinum efficiency equipment said they would not sell as many without the Xcel Energy incentives, and that their sales of efficient power supplies would eventually decrease if the program were not available as the incentives go directly to support the marketing efforts of all manufacturers. The one regional manufacturer also felt that their sales of bronze level computers would drop to zero in six months without the program incentives. All stated that more could be done to raise commercial customer awareness of the benefits of efficient power supplies.

For bronze level efficiency equipment, this equipment has become a more consistent installation among participating national manufacturers, in part due to the support of Xcel Energy and others supporting this ENERGY STAR program for almost a decade, providing some evidence of market effects. While this might suggest lower attribution for bronze equipment on future installations, Xcel Energy will be accounting for reduced per unit gross savings estimates for qualifying power supplies by using a weighted average of desktop power supplies currently in the market as a baseline condition.

Downstream Rebates

For the downstream component of the program, qualitative information gathered from program participants and participating manufacturers suggests that program attribution is low (which in some cases can signal that a market has been transformed). However, program awareness among nonparticipating customers and PC power management and virtual desktop vendors is also very low. Surveys with nonparticipating customers confirms low program awareness among customers—only 15 percent of Colorado were aware of the program. Interest in efficient computer equipment is also low, as only ten percent of nonparticipating customers reported having implemented eligible projects outside the program. Further, interviews with nonparticipating customers suggests that sales of program-eligible equipment outside the program is low. This low awareness, combined with limited outside program sales, suggests that the lack of knowledge and awareness of program-eligible equipment is still a major market barrier, and the market is not transformed.

I4. RECOMMENDATIONS FOR MONITORING MARKET EFFECTS IN FUTURE EVALUATION RESEARCH

One challenge within Xcel Energy's 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).[48]

This definition stresses the market rather than the program nature of market effects. Massachusetts also focuses on markets, rather than individual programs.

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 establishing measureable market effects indicators. 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.

With these consideration in mind, we recommend the following potential evaluation activities be considered in the future to measure and monitor market effects on a program-by-program basis for prioritized DSM programs for future evaluation efforts. This will allow evaluators to more fully document and describe all of the impacts resulting from Xcel Energy's programs.

[48] Joe Eto, Ralph Prahl, 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.

1. **Identify and prioritize those programs or markets where significant nonparticipant spillover is expected and additional research makes the most sense to fund.** We make this recommendation as market effect studies can be expensive and take more time than permitted by the current annual program evaluation framework.

2. **For prioritized programs or markets, develop the framework from which market effects are to be evaluated.** As described earlier in this appendix, this step would include identifying the target markets, conducting research to characterize the market, identifying the baseline and ensuring that adequate savings are possible, developing a market model, developing program theory and logic models, and developing a market transformation story. This logical framework is critical to establish the most appropriate market transformation indicators that can be measured over time.

3. **Assess past research to support near-term program market effects research and consider implementing comprehensive market characterization and 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 similar approach should be taken with the DSM market effects research in order to measure trends over time. Market transformation indicators examined in these studies could include:

    - Customer awareness/knowledge of energy efficient product
    - Customer acceptance/adoption
    - Customer awareness/knowledge of Xcel Energy program offerings
    - Saturation/penetration
    - Barriers to taking energy efficiency actions

    Xcel Energy has been conducting evaluation research and other DSM program research for a number of years. We recommend in the near term that Xcel Energy and evaluators assess past research that can serve as a baseline for future evaluation research.

4. **Consider expand both the number and scope of trade ally surveys for prioritized programs or markets.** One of the highest levels of rigor to quantify market effects involves tracking sales data. 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 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.

    In the absence of reliable sales data, we generally recommend 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 recently used in 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 annual program evaluation scopes. For prioritized programs, we would recommend a census sample of all participating trade allies be used from the last three years as well as including a sample of nonparticipating trade allies. 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.

Examples of market transformation indicators examined in these trade ally surveys could include:

- Market actor awareness/acceptance/adoption
- Market share/sales with and without program in Xcel Energy's territory
- Influence of program on market share/sales
- Market share/sales without program in other territories
- Product availability
- Incremental cost
- Participation in trainings/education provided by Xcel Energy
- Customer decision-making practices
- Customer demand over time

5. **Consider implementing Delphi expert panels to estimate nonparticipant spillover and other attributable market effects for prioritized programs.** 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. Some of the recent market effects studies in California and elsewhere (Arizona) are employing Delphi techniques[49] to review prior research and current research on market transformation indicators to estimate nonparticipant spillover. A particular value of the Delphi approach is providing a defensible attribution estimate of market effects specific to utility programs.

[49] 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).

A typical study presents expert panelists with detailed data regarding practices, sales, and other market transformation indicators. 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 utility program and to other factors such as economy, energy prices, etc., and to estimate the percentage of net savings attributable to the program.

Recommendation	Response
The evaluation team recommends using the current upstream NTG estimate of 88 percent prospectively in Colorado across all power supply efficiency levels. In addition, we also recommend the continued use of the current downstream NTG estimate of 80 percent prospectively in Colorado until more quantitative research can be conducted with a larger number of participants.	Xcel Energy will continue to use the current upstream NTG estimate of 88 percent across all power supply efficiency levels, and the current downstream NTG estimate of 80 percent. If a larger number of participants become available we will conduct more quantitative research.
Continue to monitor ENERGY STAR industry data for changes in the proportion of Bronze power supply installations.	Xcel Energy will continue to monitor ENERGY STAR industry data for changes in the proportion of Bronze power supply installation and make appropriate adjustments.
Investigate the feasibility of engaging additional manufacturers that are not currently participating in the program. The resources needed to recruit and enroll new manufacturers should be weighed against the benefits of impacting additional sales of 80 PLUS power supplies.	The Xcel Energy is working on developing a Trade Channel for the computer efficiency program to more easily onboard non-participating manufacturers. Ecova the third party implementer of the Upstream program is also actively looking for new manufacturers
Consider implementing additional outreach methods for increasing customer awareness and influence of downstream rebates by partnering with PC power management vendors for outreach, cross-promoting PC power management with other control-based rebate marketing, and emailing or mailing bill inserts to commercial customers to highlight the program benefits and procedures for participating.	Marketing efforts and strategies are being formed to better reach downstream customers. This will include building a trade network, partnering with other DSM programs as appropriate, and creating/updating of educational collateral for distribution

Recommendation	Response
Continue offering upstream program incentives for 80 PLUS power supplies to support marketing and promotion of energy efficient power supplies to commercial customers. Also, consider including promotional messaging for the upstream incentive in downstream program marketing materials to supplement manufacturers' marketing efforts.	Xcel Energy will continue to offer upstream program incentives for 80 PLUS power supplies. Xcel Energy will work with Ecova on distribution of upstream materials through downstream channels.
Monitor impacts of reducing upstream incentives on manufacturer sales, marketing, training, and spiff funding.	Xcel Energy will monitor the impact of reducing the upstream incentive on manufacturing sales, marketing, training, and spiff funding and report results in quarterly round tables and adjust marketing strategies as appropriate
Review PC power management incremental cost assumptions and evaluate the feasibility of increasing the downstream incentive to encourage additional participation.	Program management will work with engineering to evaluate PC power management incremental cost assumptions and consider increasing the downstream incentive to be more competitive with utilities rebate levels.
Maintain current internal communication processes and continue to ensure there are adequate resources to effectively administer program functions.	Xcel Energy will continue internal communication processes, and continue to ensure there are adequate resources to effectively administer program functions
Consider adding supplemental information to support QA/QC efforts, such as more specific IT contact information, to the program application and Salesforce. Alternatively, consider developing a standardized template for account managers to use when collecting and tracking contacts, discussions, and installations for QA/QC to maintain consistency and collect needed information.	Xcel Energy will make adjustments to appropriate forms to capture contact information for IT decision makers. The Computer Efficiency Program staff will look into adding or creating additional forms and templates for Account Management groups. Xcel Energy will work more closely with account managers prior to processing downstream rebates, to ensure the equipment is installed in our service territory.
Increase outreach to commercial customers that targets accounts payable, Vice Presidents, CIOs, and sustainability departments.	Xcel Energy will make adjustments to appropriate forms to capture contact information for key decision makers. To increase outreach Xcel Energy will also consider purchasing an email or mailing list.

Recommendation	Response
Increase engagement with PC power management software vendors to help promote program offerings to Xcel Energy customers.	Xcel Energy is working on building a trade channel to identify, educate and develop partnerships with downstream vendors about the Computer Efficiency program
Educate PC power management vendors on program eligibility requirements that may preclude schools from participating unless they operate the full year. Additionally, explore feasibility of targeting marketing campaigns to school districts and universities that operate with a more consistent, single-shift schedule.	Xcel Energy currently follows up directly with the trade partners on individual eligibility issues. Xcel Energy is also working on building a trade channel to educate and develop partnerships with downstream vendors about the Computer Efficiency program. Additionally Xcel Energy will explore strategies to better work with customers in the education market segments.
Continue performing QA/QC on PC power management to ensure issues are identified and resolved quickly. Protocols for checking PC power management should include running system reports and checking that a sample of individual machines are controlled.	Xcel Energy will continue to perform QA/QC on PC power management per program requirements outlined in the application and contract with third party M&V auditors
Review the savings opportunities from small form factor or mini towers.	The Xcel Energy Computer Efficiency product team is working with the Product Development department and Ecova to look into this option for a product line extension
Maintain high satisfaction rates through clear and consistent communication with Ecova, manufacturers, account managers, and customers.	Xcel Energy will continue to strive for high satisfaction rates with all stakeholders.