EMI CONSULTING

Xcel Energy Minnesota Water Heater Rebate Program 2018 Evaluation

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FINAL REPORT

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Introduction

The Xcel Energy Water Heater Rebate program in Minnesota offers residential customers rebates when they install qualified natural gas storage and tankless water heaters. Rebates range from $50 to $250 dollars and depend on the water heater's uniform efficiency factor (its efficiency level), draw pattern, and size. Customers may apply for a rebate directly, but most rebates are initiated on behalf of the customer by the installing contractor.

Xcel Energy engaged a team of researchers led by EMI Consulting to conduct a process evaluation and strategic assessment of the Water Heater Rebate program. For the process evaluation, the team assessed customer and trade partner satisfaction, the customer journey paths associated with qualifying installations, and program processes. For the strategic assessment, the team investigated industry trends, considerations for electric thermal storage using water heaters, and factors related to customer acceptance of such programs. Based on the results of this research, the evaluation team developed key findings and recommendations for Xcel Energy.

Methods

Participant telephone interviews (n=47)

Trade partner interviews (n=17)

Staff interviews (n=6)

Focus groups (n=2)

File review of denied applications (n=50)

Secondary research

Fielding:
Mar 2018 – Sep 2018

Key Findings

Both participants and trade partners are **satisfied with the program**. Satisfaction rates by participants for individual program components range from 89 to 94%. Furthermore, 78% of active trade partners rated the program a 4 or 5 on a 5-point scale.

Rebate amounts—constrained by cost-effectiveness calculations—**are too low to influence most customer water heater selections**. For these customers, the rebates may increase customer satisfaction and reinforce the importance of appliance efficiency.

Active trade partners assess program communications as good and emphasize the importance of continued active updates. Other trade partners participate less frequently because the bulk of their business is outside Xcel Energy's service area or involves less efficient water heaters.

Industry and technology changes are prompting shifts in water heater programs. Rebate programs are trending toward heat pump water heaters. Carbon policies and shifting generation mixes have focused attention on the benefits of electric thermal storage using residential water heaters.

Strategic Assessment Results

Program cost-benefit is below 1: The Water Heater Rebate program's cost-effectiveness stands at 0.68 according to the societal benefit-cost test. Consistent cost-ineffectiveness provides a reason to reconsider the program's structure.

Industry shifting toward heat pump water heaters: Water heater rebate programs in the Northeast and Northwest—as well as Xcel Energy's water heater program in Colorado—have been shifting toward heat pump water heaters.

Examination of electric thermal storage: Increasing consideration of carbon and shifting generation mixes are spurring consideration and planning among industry organizations nationally and in several regions for electric thermal storage as an efficiency approach. National discussions suggest that electric water heaters eventually will be integrated into the grid with communicating and control technologies and possible rate incentives.

Xcel Energy customers open to electric thermal storage pilot: Xcel Energy customers with electric water heaters appear open to participating in an electric thermal storage pilot or program. Participation would depend on program details; providing options and ensuring sufficient hot water are keys to overcoming barriers to interest.

2018 Minnesota Water Heater Rebate Product Evaluation

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Process Results

Customers

Participants generally replace failing water heaters with a similar model.

- 55% of participants replaced a water heater that was starting to fail; emergency replacements are comparatively infrequent (15%).
- Participants tend to seek a single recommendation for a replacement model, usually from a contractor.
- Only a minority of participants made intentional changes in water heater specifications to the model they replaced.

Customers whose applications are returned or denied take it in stride.

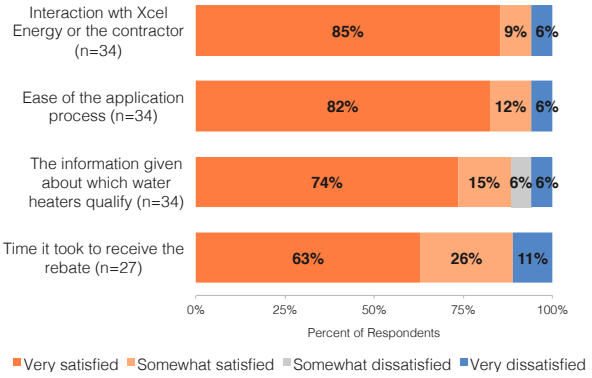
- Most customers with returned or rejected applications were content with the process; small numbers think Xcel Energy or the contractor could have been more proactive.
- Occasionally, trade partners are caught off guard by program changes despite Xcel Energy communications, leading to denied applications.

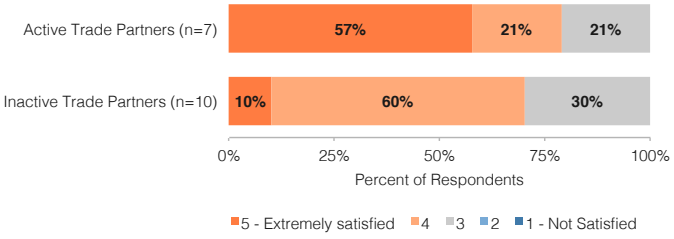
Trade Partners

Trade partners find the program positive and easy to work with.

- Program communications and application processes are seen as good. The online application process is well-received by users.
- Customers like the rebates, but trade partners think the rebate amounts are insufficient to sway choices.
- Some trade partners participate infrequently due to geography and a focus on less efficient water heaters that do not qualify under program rules.

Program Satisfaction by Participants ..... and Trade Partners





Key Conclusions, Recommendations, and Suggestions

1) Participating customers and trade partners are happy with the program; processes are functioning smoothly. The online application process is highly regarded by trade partners using it.

2) Denied applications can lead to sporadic customer dissatisfaction and challenges for trade partners.

3) Some trade partners engage infrequently due to their geographic or product focus (on less efficient water heaters).

4) The program is not cost-effective; constrained rebate levels are too low to influence most customer choices.

5) There appears to be sufficient openness among customers to design and pilot a water heater thermal storage program.

1.1) Promote the online application to trade partners who are not already using it.

2.1) Conduct “early warning” analysis of incoming applications to identify trade partners associated with ineligible applications.

2.2) Consider more personalized outreach to customers whose applications are denied.

3.1) If program growth is desired, increase outreach and education to less active trade partners.

4.1) Xcel Energy could restructure its involvement in the water heater market and its engagement with customers on water heating.

5.1) If Xcel Energy initiates a water heater storage program, such an offering should be piloted with flexible designs and participant choice to broaden the appeal.

1. INTRODUCTION

Xcel Energy offers a comprehensive array of demand side management (DSM) and other energy services and products to its customers. For the evaluations of its products offered in 2017 and 2018, Xcel Energy sought to improve the customer experience, understand the products' roles in changing the marketplace, analyze the product influences on customer choices, and ensure industry-leading program performance. To accomplish these goals, Xcel Energy contracted with EMI Consulting and its partners: Evergreen Economics, Apex Analytics, and Ridge & Associates (hereafter 'the evaluation team'). This team undertook evaluations of nine products offered in Minnesota and Colorado in 2017 and 2018, including the Water Heater Rebate program in Minnesota discussed in this report.[1] This introductory section describes the program, the evaluation's research questions and priorities, and the evaluation methods. The report highlights the evaluation of the 2017 Xcel Energy Water Heater Rebate program.

1.1 Program Description

Xcel Energy's Water Heater Rebate program has offered rebates to residential customers that install qualifying water heaters since 1997, with an interruption in 2005 and 2006. Rebates of $75 are available for storage tank water heaters and $250 for tankless water heaters. Minimum efficiency levels are based on Uniform Energy Factors (UEF) and must be at least 0.64 for medium-draw storage units, 0.68 for high-draw storage units, or 0.87 for tankless models.

Storage tank water heaters comprise 90% of rebated water heaters. Xcel Energy estimates that they save around 25 to 35 therms annually compared to baseline models and cost between $200 and $400 more than the assumed baseline model (a storage water heater with a traditional energy factor of 0.62). Tankless water heaters comprise fewer than 10% of rebated water heaters; Xcel Energy estimates that they save around 90 therms annually and cost about $600 more than the baseline storage water heater.

The program has exceeded participation and energy savings goals most years, but has proven to be cost-ineffective due to low prices of natural gas. Table 1-1 shows participation and computed savings in 2017. Program marketing occurs primarily through participating trade partners—two-thirds of applications list a trade partner—and point-of-purchase materials in plumbing aisles of some big box hardware stores in Xcel Energy's service area. However, Xcel Energy has not made additional marketing a priority due to the program's cost-ineffectiveness.

[1] The programs selected for evaluation in 2018 are: Water Heater Rebates (MN), Business New Construction (MN), Motor Efficiency (MN), Multi Family Buildings (MN), Commercial and Industrial Lighting (CO), Custom Efficiency (CO), Residential Lighting (CO), and School Education Kits (CO). The evaluation team prepared a separate report for each of these evaluations.

Table 1-1. Participation and Energy Goals and Actuals - 2017

	Goal	Actual
Participation	948	1,621
Natural Gas Savings (dekatherms)	3,053	5,215

CAMEO group[2] classifications suggest that participants are disproportionately homeowners with above average incomes. The vast majority of rebated units are replacements of failed or failing water heaters.

While Xcel Energy is committed to promoting efficient water heating to its customers, the company wished to explore broader, cost-effective ways to provide value to customers through water heating-related initiatives.

1.2 Evaluation Objectives and Research Questions

The evaluation team identified the evaluation objectives and research questions jointly with Xcel Energy based on discussions at the kickoff meeting and subsequent staff interviews. Table 1-2 presents the evaluation objectives and research questions associated with each objective. The table also specifies the report sections in which results for the various research questions appear.

Table 1-2. Evaluation Objectives and Research Questions

Research Objectives and Questions	Report Section
1) Inform opportunities for the program to offer electric thermal storage to customers with electric water heating (high priority) • What are key considerations for customer acceptance and interest in an electric water heater thermal storage program? • What are common elements of electric thermal storage efforts elsewhere, including learning from electrification studies (in California, northern Europe, etc.)? • What technology is being developed? • How are state policy goals concerning carbon being addressed through better management of electric end-uses and/or electrification? • What technology is already available and in use that allows for electrical thermal energy storage? • What are the potential energy savings, carbon savings, and non-energy benefits of controlled electric water heaters?	Section 3.2

[2] CAMEO classifications are a proprietary customer segmentation scheme that Xcel Energy uses.

2) Assess participating customer satisfaction with the existing program offerings (elevated priority) • What is customer satisfaction with the program and program elements? • What is the cause of high does-not-qualify rates among customer applications? What would be required to reduce the rate and how does that improve customer satisfaction? • What is the program's net promoter score? • How important are water heater rebates to customers?	Sections 2.2, 2.3
3) Obtain trade partner perspectives on the program (elevated priority) Participants • What aspects of the program do participating trade partners find helpful? • Do trade partners consider the rebate influential in affecting customer decisions? • What aspects of the program do trade partners think could be improved? • What are the incremental costs of the rebated water heaters compared to alternatives? Non-participants • What is program awareness among non-participating trade partners? • What are non-participating trade partner perceptions of the program? • What would it take for non-participants to make use of the program? • How do HVAC and plumbing-only contractors differ on these questions?	Sections 2.1, 2.2, 2.3, 3.1
4) Compare Xcel Energy program to peer utilities (medium priority) • Are there cost-effective electric water heater programs? What is their design and what makes them cost-effective?	Section 3.2 (light coverage)
5) Obtain a deeper understanding of the customer process and journey for water heater replacements (medium priority) • What prompts a water heater replacement? • What steps do customers take? • What information sources do they use? • Do they engage retailers, HVAC/plumbing contractors, and/or plumbers? How many contractors do they contact? • What do they hear from the professionals they contact? • How do they rate key decision factors in their choice of their replacement water heater? • Are they aware of Xcel Energy rebates? Where do they fit into the process and priorities?	Section 2.1

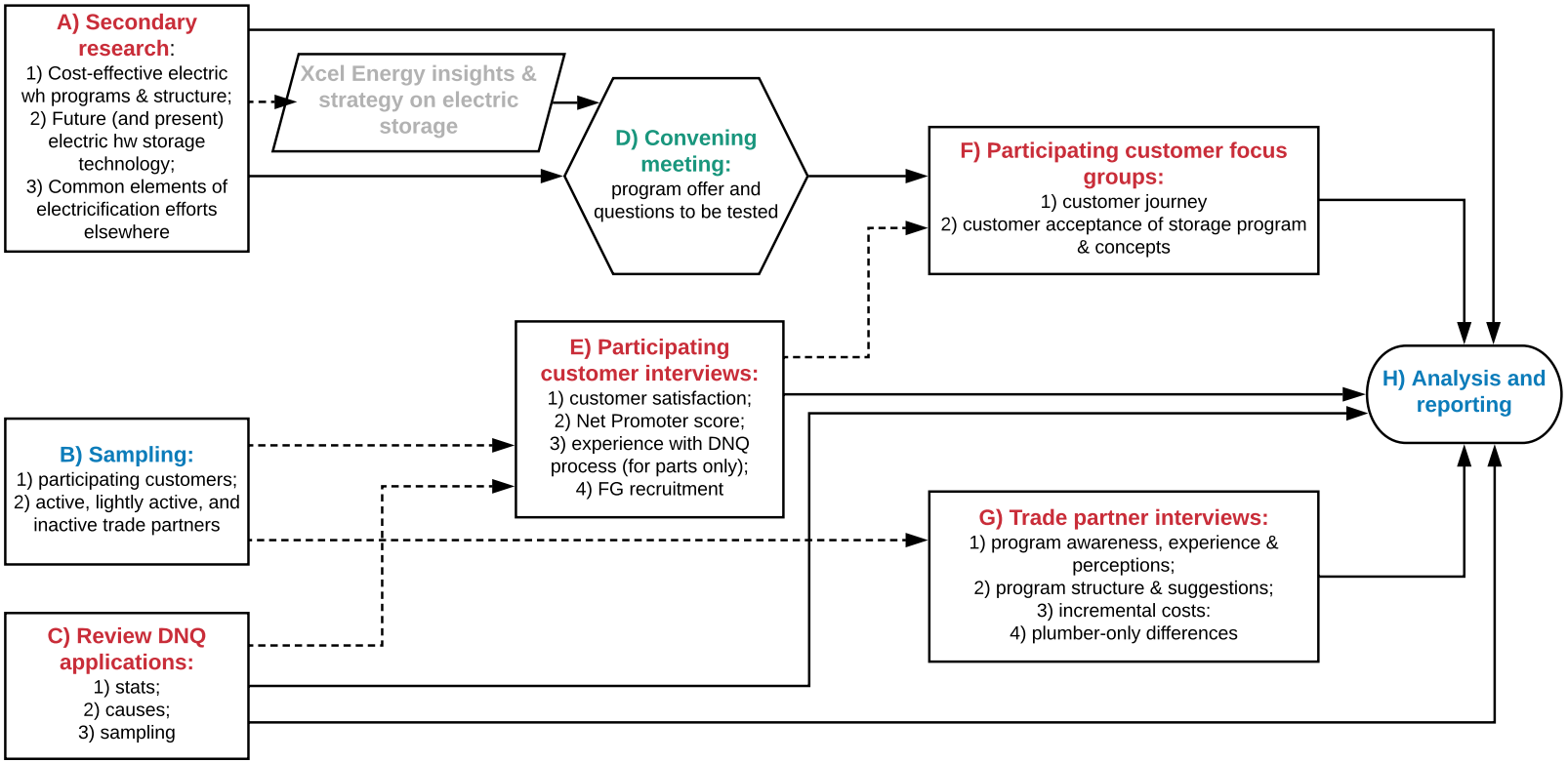
1.3 Evaluation Methods

To address the evaluation objectives, the evaluation team conducted primary research consisting of interviews and focus groups involving strategically selected groups of program stakeholders, including program participants, potential participants, and trade partners, as well as targeted secondary research. Table 1-3 lists the evaluation activities in more detail. Figure 1-1 illustrates their interrelationships visually.

Table 1-3. Evaluation Task Summary

Evaluation Task	Completions	Task Role in Addressing Evaluation Objective(s)
Staff Interviews	6	Inform evaluation priorities and plan
Secondary Research	n/a	Compare program to peer utilities on cost-effectiveness Inform potential use of water heater program for electric thermal storage
Review Rejected (DNQ) Applications	50	Inform customer satisfaction with the program (limited to DNQ customers)
Convening Meeting with Xcel Energy	1	Inform participant focus groups that will test program options or concepts
Participant Interviews	47	Assess participant satisfaction and DNQ experiences (subset of interviews), compute net-promoter score, and serve as screening and recruitment vehicle for focus groups
Participant Focus Groups	19 participants, 2 groups	Explore and understand customer journey during water heater replacement Test prospective customer reactions and acceptance of potential water heater program offerings with an electric thermal storage component
Trade Partner Interviews	17	Understand trade partner awareness, experience, perceptions, and suggestions for the program Explore incremental costs of qualifying water heaters Explore and confirm perceived differences between plumbing-only trade partners and those who provide HVAC services as well

Figure 1-1. Evaluation Project Flow Diagram



1.4 Report Organization

The following chapters organize the evaluation findings into two components: process and strategic evaluation results. Chapter 2 presents process evaluation results, including discussions of customer and trade partner engagement, participant satisfaction, and rebates and application processing. Chapter 3 discusses strategic program considerations, including cost-effectiveness and potential future program directions. Detailed, descriptive methodology information, evaluation plans, and data collection instruments can be accessed in the report's appendices.

2. PROCESS EVALUATION FINDINGS

A process evaluation of the 2017 Water Heater Rebate program was a central component of this study. The process evaluation assessed the evaluation questions outlined in Table 1-2 that addressed the program as it is currently delivered. These evaluation objectives are addressed in this chapter as follows:

- Section 2.1 on customer and supply chain engagement addresses evaluation objectives on the customer process and journey, as well as trade partner perspectives on the program dealing with awareness and participation levels.
- Section 2.2 on participation satisfaction addresses evaluation objectives on both customer and trade partner satisfaction with the program.
- Section 2.3 on market actor experiences with application processes addresses evaluation objectives related to application processes, communications, and instances in which applications are rejected because water heaters did not qualify for a rebate.

The findings presented below are based on:

- Telephone interviews with 40 participating customers whose rebate application in 2017 and early 2018 was processed normally;
- A review of 50 randomly selected applications in 2017 and early 2018 that were initially returned to the customer or rejected;
- Telephone interviews with 7 customers whose rebate application in 2017 or early 2018 was initially rejected, including 5 customers whose water heaters were found to be ineligible and 2 whose applications could be corrected and paid;
- Telephone interviews with 17 trade partners, including 10 with light participation levels in 2017 (with fewer than 20 rebates) and 7 with active participation levels (20 or more rebates).[3]
- A focus group of program participants; and
- Informal visits to three Twin Cities metro home improvement stores.

Key findings, discussed in more detail below, are:

- Participating customers generally seek a simple replacement of their existing water heater and rely on a single contractor's recommendation for the model they purchase.
- The Xcel Energy rebates are well-received, but do not affect the customer's choice of water heaters for the majority of qualifying purchases.
- Participating customers and trade partners are satisfied with the program.
- Less active trade partners participate infrequently because they focus on less efficient water heaters or geographies in which Xcel Energy is not the natural gas provider.
- Customers with rejected applications generally take them in stride, but some do fault either Xcel Energy or their contractor for weak communications. Trade partners occasionally miss communications about program changes, leading to applications for ineligible water heaters.

[3] Note: Trade partners account for about two-thirds of rebated water heaters. Ten active trade partners were associated with 20 rebates or more and account for 20% of all participation.

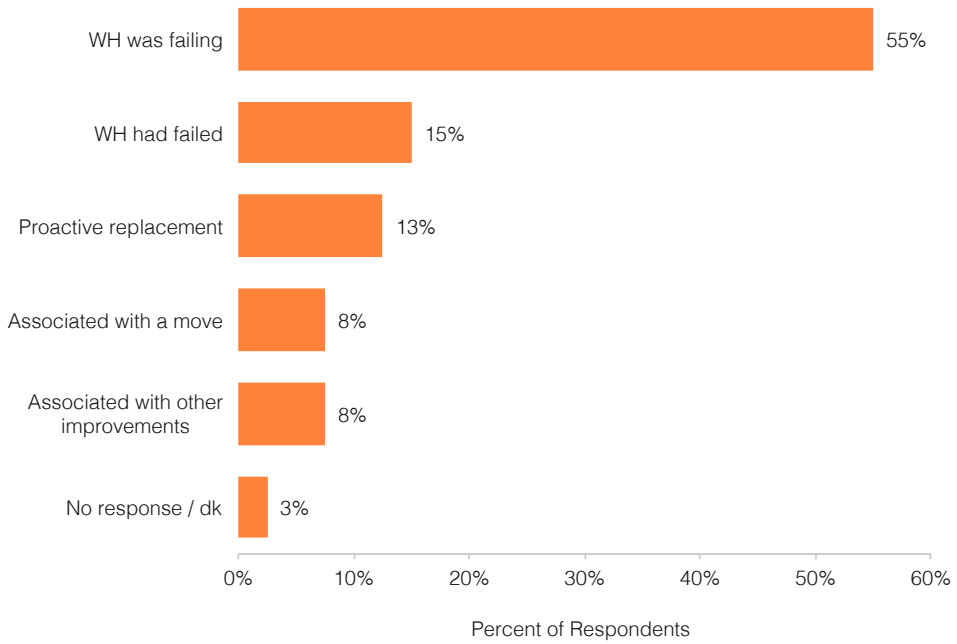
2.1 Customer and Supply Chain Engagement

Program participation typically involves a residential customer making a water heater purchase and either a local trade partner (that sold the water heater and installed it) or a local retailer (that sold the water heater to a customer either with or without installation services). The evaluation team examined the participating customers' journey toward their new water heater and the roles of the market actors in the customers' decision making. While Xcel Energy's program is well-received, it appears to serve more as an opportunity to reinforce efficient choices than to drive customers from less efficient water heaters toward more efficient ones.

Participating Customers

To better understand customer and supply chain engagement, the evaluation team used participant interviews to explore the "customer journey," including what prompted participating customers to replace their water heaters, select rebate-eligible models, and file for rebates. The predominant scenario among program participants involves a homeowner with an existing natural gas water heater that needs replacement, engagement of a contractor or a visit to a store with the intent to replace the existing water heater with a similar unit, and reliance on the contractor or retailer to identify an appropriate model. As indicated in Figure 2-1, most water heaters were failing but still operational, which gives the homeowner a bit of time to make a selection.

Figure 2-1. Reason for Water Heater Replacement (n=40)

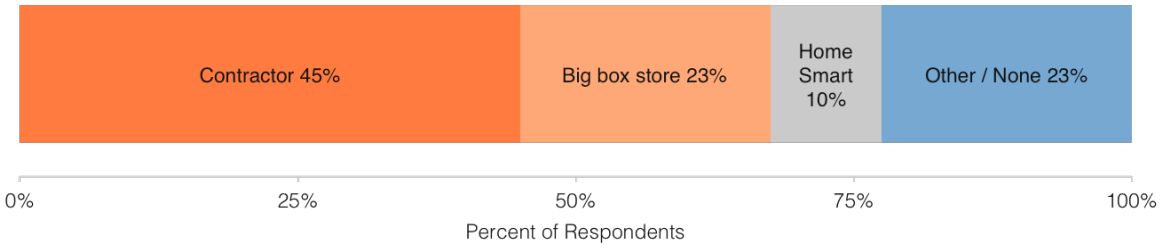


Overall, two-thirds of participants purchased their water heaters from a plumbing or full-service contractor, and the remainder purchased theirs from a retail store. Contractors included both

HomeSmart from Xcel Energy and CenterPoint Energy's Home Service Plus program, which provide unregulated appliance and repair services to customers. Retailers comprised mostly big box hardware stores. Most participants interviewed for this evaluation reached out to only one vendor, so the contractor or retailer that sells the water heater is often also the only one with the opportunity to advise the customer.

Figure 2-2 illustrates the relative degree to which participants relied on independent contractors, big box retailers, and HomeSmart from Xcel Energy for information and recommendations.

Figure 2-2. Information Sources for Water Heater Recommendation (n=40)



When participants reach out to the vendor, their intent is usually to replace their existing water heater with a current model that fulfills the same specifications. Participants recalled that conversations with their vendors focused primarily on the vendor's recommendation and price, with size, efficiency, and recharge rates coming up in some of the conversations.

Indeed, customers do appear to replace their water heaters with very similar models to the ones they are replacing. The participants interviewed for this evaluation included only eight (of 37 with usable responses to the question) who indicated that they increased their tank size and one who changed water heating fuels (from electricity to natural gas). Interestingly, most participant interviewees did not know how the efficiency level of their new water heater compared to the one they replaced; only eight (of 33 with a usable response) think they upgraded to a water heater with a higher efficiency level.

Trade Partners

Similar to the research with participating customers, the evaluation team asked trade partners about the context in which their customers are replacing water heaters, what they typically discuss with their customers, and what they typically install for customers. Trade partners echoed the same stories and patterns described by participating customers. In general, the vast majority of their residential customers who buy a new water heater are replacing a water heater that has failed or is not working well.

In terms of the topics trade partners typically discuss with their customers during the equipment selection process, the most frequent characteristics discussed were price, tank size, safety, and occasionally efficiency. Trade partners generally said that they tend to replace a customer's existing

water heater with a similar model, but that it ultimately comes down to price and what size tank the household requires.

When asked about their involvement with the program, six of the seven active trade partners interviewed for the evaluation said they have been offering Xcel Energy water heating rebates to their customers either since the program was first offered or for several years.

The less active trade partners interviewed for the evaluation tended to serve an area mostly outside of Xcel Energy's service territory (4 of 10 less active trade partners) and frequently install less efficient water heaters (3 out of 10). Both of these contributed to the small number of rebates these contractors have been associated with in the last few years. The less active trade partners are aware of the rebates, and some do offer them when they have an eligible customer installing eligible equipment. However, for the most part, less active trade partners are not frequently promoting the availability of the rebate. Additionally, there appeared to be some confusion from a few of the less active trade partners in terms of what is considered to be an efficient water heater; two trade partners seemed to think that all new water heaters are efficient.

Retailers

Xcel Energy outsources its retailer-based promotion of its water heater rebates through the same implementation firm that manages the lighting program's retail promotions. This contractor manages point-of-sale efforts in applicable stores with whom they already work on lighting promotions.

Review of retail engagement was not a formal part of this evaluation, but the evaluation team had an opportunity to do some limited review of in-store promotions in the Twin Cities metro area in conjunction with a project-related visit to Minneapolis, as well as some review of online messaging by large retailers. This limited review suggests that:

- There is prominent signage about Xcel Energy water heater rebates in at least one store in Ramsey County (see Figure 2-3).
- Retail stores in Hennepin County appear more likely to display information about just CenterPoint Energy rebates, even though Xcel Energy natural gas customers may shop at some of these stores as well. Others make more general references to utility rebates without naming specific utilities or rebate offers (see Figure 2-4).
- Online shopping for water heaters at major hardware stores revealed pop-ups displaying water heater rebates for CenterPoint Energy and Minnesota Energy Resources Corporation, but no such notices for Xcel Energy, even for store locations at which Xcel Energy is the natural gas provider.

Figure 2-3. In-Store Signage at a Big Box Retail Store in Ramsey County

Figure 2-4. Generic In-Store Signage by a Retailer in the Twin Cities Area

2.2 Program Satisfaction

The evaluation team assessed participant and trade partner satisfaction with the Water Heater Rebate program through interviews with both. Note that this report discusses effects of rejected applications on customer satisfaction in a subsequent section.

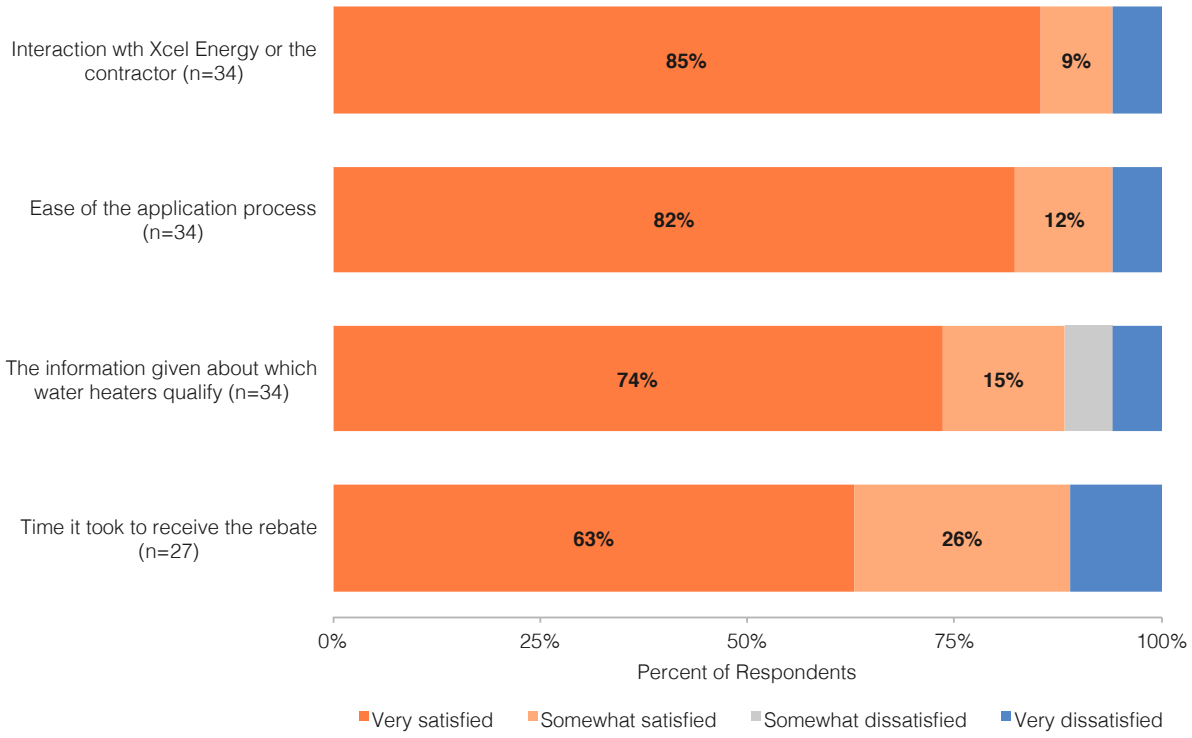
Participating Customers

Interviews with customers whose rebate applications in 2017 or early 2018 were approved revealed high customer satisfaction. As shown in Figure 2-5, participants expressed high rates of satisfaction with their interaction with their contractor or Xcel Energy staff (86%), the ease of the application process (82%), and the information they received about which water heaters qualify (74%). Participants were also generally satisfied with the amount of time it took to receive the rebate, but they would not mind receiving it sooner (a common response to questions about rebate timing).

Furthermore, in response to an open-ended satisfaction question, four-fifth of participants had no suggestions for improvements. Those who did provide suggestions gave little indication of any concerns or problems with the program. Suggested changes included:

- More marketing of the program's availability (3 mentions);
- Increasing the rebate amount (1 mention);
- Expanding the rebate to other measures (1);
- Bypassing the contractors so the customers work directly through Xcel Energy for the rebate (1); and
- Decreasing the rebate processing time (1).

Figure 2-5. Customer Satisfaction Metrics (n=40)



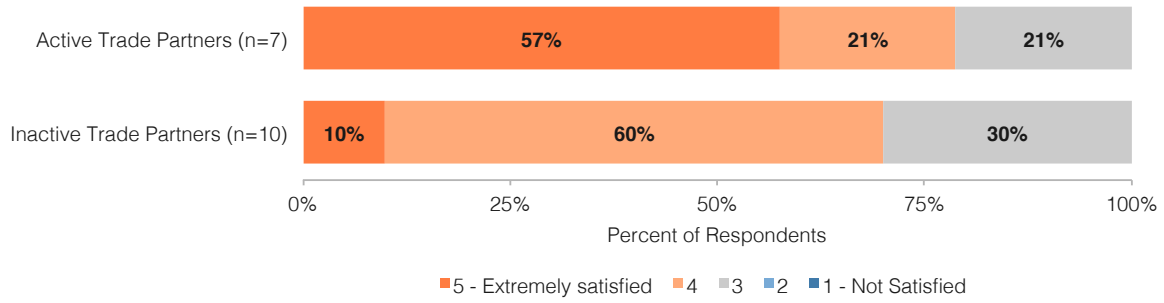
Trade Partners

The evaluation team asked trade partners about their overall satisfaction with the program on a scale from 1 to 5 where 1 is 'not satisfied' and 5 is 'extremely satisfied.' On average, active trade partners were more satisfied with the program than inactive trade partners, with 57% of active trade partners giving a rating of 5 out of 5 and only 10% of inactive trade partners giving that rating. The majority of inactive trade partners rated their satisfaction as a 4 on the 5-point scale. No trade partners gave a

rating lower than a 3. The responses from active and inactive trade partners are summarized below in Figure 2-6.

For any trade partners that gave a rating of 4 or lower, follow-up questions inquired what Xcel Energy could do to increase their satisfaction with the program. The most common responses included increasing the rebates and lowering the efficiency level required to be eligible for the rebate. One inactive trade partner also recommended increasing outreach and education to contractors.

Figure 2-6. Overall Trade Partner Program Satisfaction



2.3 Market Actor Experiences with Application Processes

The evaluation team examined the primary program offer (the rebates) and processes associated directly or indirectly with rebate processing and minimizing ineligible applications. Interviews with participating customers (including some whose initial applications were denied) and trade partners pointed to modest influence of the rebate on efficiency levels of purchased water heaters, high satisfaction with the online application, and occasional concerns about denied applications that could be ameliorated through enhanced communications.

Rebates

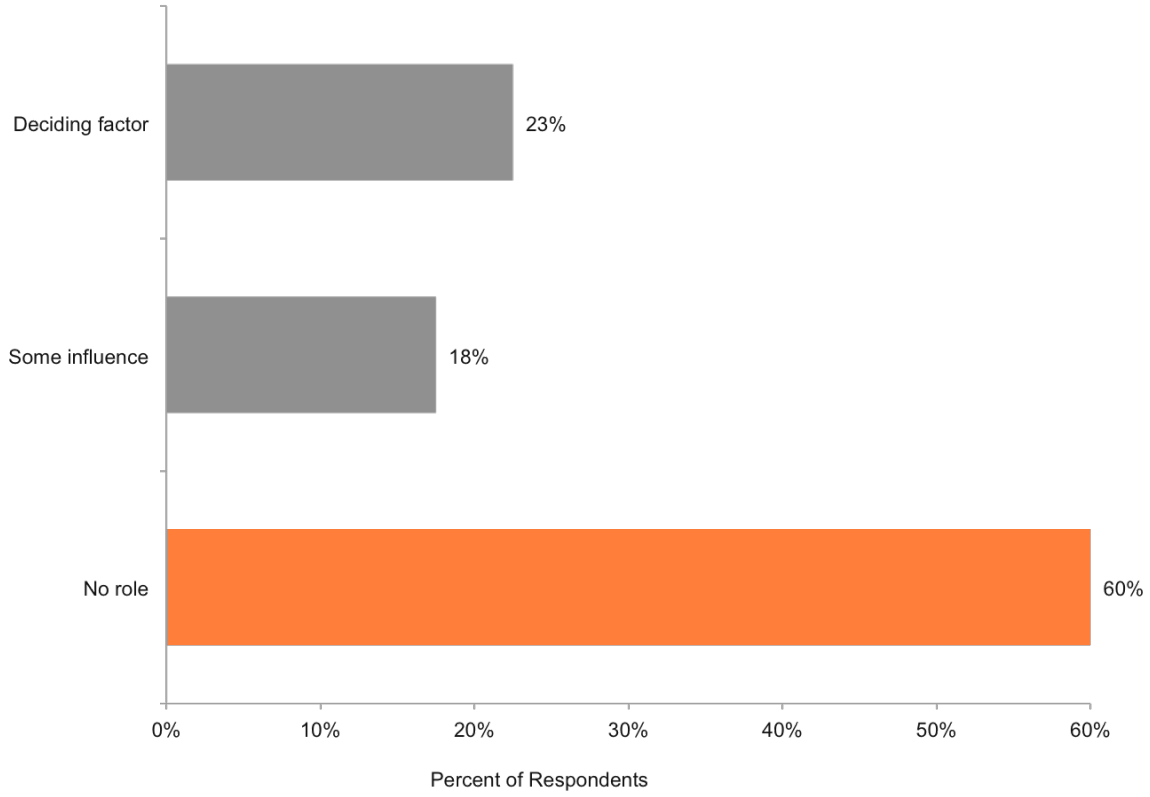
As noted, rebates are currently $75 for qualified storage tank water heaters, which comprise about 90% of rebated water heaters, and $250 for tankless types. In comparison, CenterPoint Energy, which serves an adjacent service area and overlaps with Xcel Energy in the contractors and retail stores that serve the utilities' customers, offers a substantially higher rebate for the storage tank water heaters with power-venting ($250), while offering the same rebate as Xcel Energy for other water heater types. It appears that CenterPoint Energy is able to offer the higher rebate by incorporating health and safety considerations into their cost-benefit computations.

Trade partner and customer feedback suggest that Xcel Energy's current rebates are well received by customers, as most rebates would be, but are generally not enough to drive the customer's selection of a particular water heater (or efficiency level) over another.

The majority of trade partners interviewed for the evaluation said that rebates are too low relative to the overall equipment cost, and that they are not influencing customers to choose a more efficient water heater. Some did note that customers are happy to receive the rebate, and if anything, the availability of the rebate may provide a slight boost to customer satisfaction for Xcel Energy. Inactive trade partners that tend to work more in CenterPoint Energy's service territory noted the higher incentives offered by CenterPoint, and four of the ten inactive trade partners interviewed by the evaluation team suggested that the Xcel Energy program should be expanded to include a wider range of equipment. However, it should be noted that some of these trade partners tend to sell less efficient equipment and simply wished that more of what they offer their customers would be eligible for a rebate.

Participating customers interviewed by the evaluation team suggested a modest influence by Xcel Energy's rebates on the customers' ultimate selection of water heaters. Sixty percent of respondents indicated that the rebate played no role in their decision making, while only a quarter attributed the ultimate choice of water heaters to the rebate. (See Figure 2-7.)

Figure 2-7. Rebate Influence on Customer Selection of Water Heaters (n=40)



The following explanations from interviewed participants further describe the rebate's influence on their selection of a water heater:

No influence

- None at all; I trusted the Xcel employee to recommend the best one.
- It didn't play a role at all. I wouldn't have known unless the plumber told me about it.
- No role at all. Between the installer and my house sitter, they made the decision.
- None, I found out about it later.
- Really none. I was limited to the power vent model. I had to choose between either Rheem or A.O. Smith

Some influence

- It played a bit of a role. We would have bought a water heater either way, but the rebate swayed us towards this one.
- I guess we chose a more efficient one because of the rebate, which made it more affordable.

Deciding factor

- It pushed me to get the more efficient one.
- We were only looking at water heaters that qualified for the rebates.

In contrast, the majority of customers in the focus group of program participants suggested that the rebate did sway their choice of water heaters toward the more efficient units, mostly as a nudge from one model to another. Given the consistency of the trade partner and participant interviews above, there may have been some degree of "group think" or socially desirable response bias in the focus group answers on Xcel Energy's influence.

Application Process

As noted previously in Figure 2-5, participating customers were happy with the application process. Generally, trade partners complete parts of the application for them, thereby making the process easy for the customer.

Three of the seven active trade partners interviewed stated that the application process seems straightforward from their perspective, but noted that sometimes, their customers have difficulty filling out the forms correctly. Customers sometimes leave information out, put information in the wrong place, or forget to include the invoice, even when trade partners have specifically highlighted or marked where to complete the required information. Two of the active trade partners specifically mentioned that they use Xcel Energy's online application process, and they seemed to prefer that method to the paper application.

Preventing and Handling Insufficient Applications

Rebate processing staff indicated that the Water Heater Rebate program has a higher rate of rejected applications than other Xcel Energy rebate programs, falling in the 20 to 30% range after some changes in water heater eligibility criteria earlier this year, when the efficiency standard applied to

water heaters changed from energy factors to uniform energy factors.[4] The evaluation team examined both the nature of rejected and returned applications and customer satisfaction with the process.

A review of 50 randomly selected rebate applications that were flagged as not payable upon initial review suggests that most problem applications are rejected due to the purchased water heater not having a sufficient efficiency level (29 of 50) or tank sizes that were too large to qualify (7 of 50). The remaining applications were incomplete (i.e., missing signatures, invoices, or receipts), but could be revised and ultimately paid. (See Table 2-1.)

Table 2-1. Summary of Application Dispositions

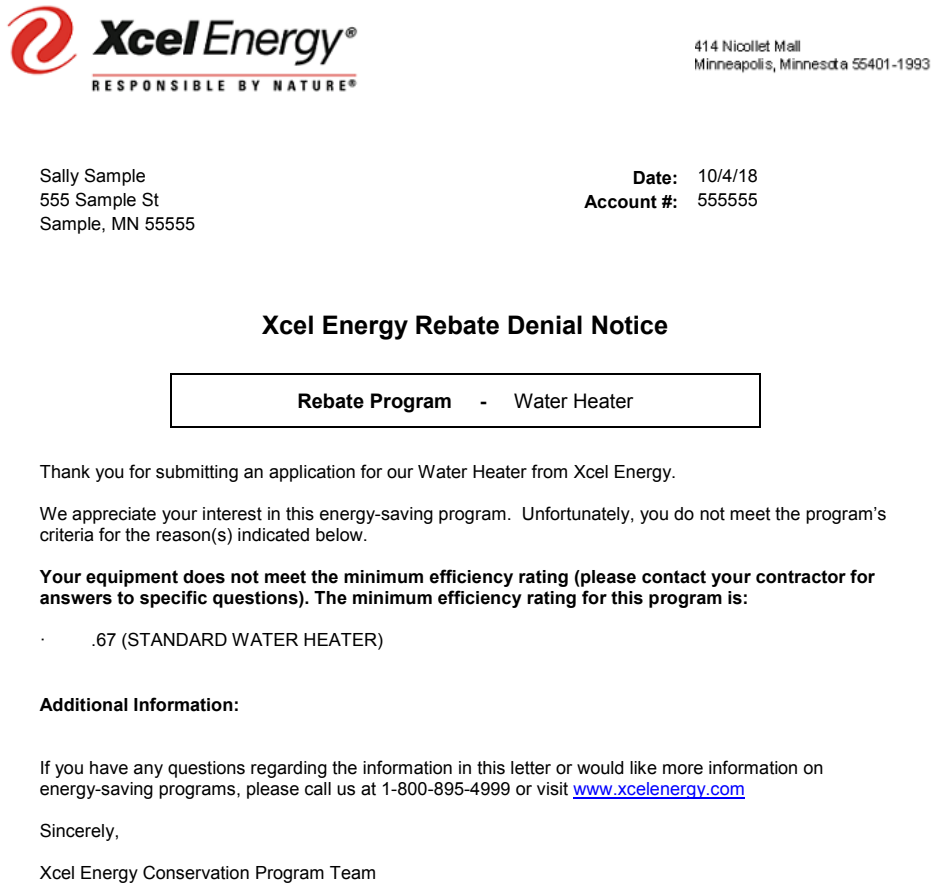
Reason for Initial Rejection	Ultimate Disposition	Trade Partner	Self-Installed	Total
Insufficient Efficiency Level (EF < .67)	Rejected / DNQ	22	7	29
Ineligible Type (Electric/Tank > 55 g)	Rejected / DNQ	3	4	7
Incomplete Rebate Application	Resolved	9	5	14

Rebates involving trade partner-installed water heaters accounted for the majority of ineligible water heaters, as well as incomplete applications. Most of these involved trade partners with only infrequent applications, but some were also from active trade partners.

Xcel Energy's rebate processing staff send form letters or e-mails to customers whose applications are incomplete or involve ineligible water heaters to notify them of the rebate application's status. Figure 2-8 shows an example letter sent to customers whose application is denied.

[4] The Department of Energy modified the test procedure and metric by which the energy efficiency of water heaters is measured. The uniform energy factor replaced the previously used energy factor in June 2017. Xcel Energy updated its efficiency requirements for rebated water heaters accordingly.

Figure 2-8. Example Application Denial Letter



Xcel Energy®
RESPONSIBLE BY NATURE®

414 Nicollet Mall
Minneapolis, Minnesota 55401-1993

Sally Sample
555 Sample St
Sample, MN 55555

Date: 10/4/18
Account #: 555555

Xcel Energy Rebate Denial Notice

Rebate Program - Water Heater

Thank you for submitting an application for our Water Heater from Xcel Energy.

We appreciate your interest in this energy-saving program. Unfortunately, you do not meet the program's criteria for the reason(s) indicated below.

Your equipment does not meet the minimum efficiency rating (please contact your contractor for answers to specific questions). The minimum efficiency rating for this program is:

· .67 (STANDARD WATER HEATER)

Additional Information:

If you have any questions regarding the information in this letter or would like more information on energy-saving programs, please call us at 1-800-895-4999 or visit www.xcelenergy.com

Sincerely,

Xcel Energy Conservation Program Team

The evaluation team attempted to interview 10 customers with applications that needed to be denied or returned for additional information (out of the initial sample of 50 such customers). The team was able to reach five customers with denied applications, but only two whose initial application was insufficient, but ultimately payable. In particular, the interviews were used to understand customer response to the negative news of having an application denied and what impacts that has on customer satisfaction with Xcel Energy.

Generally, the small number of customers interviewed seemed to take their rebate status in stride with no major concerns. Two were unhappy about the denial. One of these thought Xcel Energy could have reached out, and the other blamed the trade partner while suggesting that there was nothing more Xcel Energy could or should have done.

As noted, some of the rejected applications appeared to be connected with changes in eligibility criteria for water heaters. For this reason, the evaluation team also asked trade partners about their experience related to communications with Xcel Energy and staying up to date on program changes. In general, active trade partners indicated that communication with Xcel Energy has been good, and that they usually get quick responses or answers to any questions they may have from the channel manager. One inactive trade partner did note difficulty in communicating with Xcel Energy

representatives, but this involved an application that did not qualify, and some of the frustration stemming from the interaction appeared to be related to that.

Trade partners also reported on how clear it is to them which models of water heaters qualify for rebates and which do not. Five of the seven active trade partners said it is very clear which models qualify, and some have done their own research to check which specific models from their manufacturers are eligible for the rebate. The other two active trade partners stated they were not aware of changes to eligibility requirements in time, and this affected customer rebates. One of these trade partners had to pay the rebate out of pocket to keep their customer happy. Based on the context of these two responses, it is likely that this was partially due to an internal miscommunication at the contractor's business, especially in one case where the interviewee had only recently taken on the role of managing rebates. Nevertheless, these trade partners and a number of others emphasized the importance of knowing about program changes well ahead of when they take effect so that they can provide accurate information to their customers.

3. STRATEGIC EVALUATION FINDINGS

In addition to the process evaluation of the current Water Heater Rebate program, the evaluation team explored strategic questions to help inform the future directions the program may take. Xcel Energy staff raised these strategic questions during the evaluation kick-off and staff interviews because the program is not currently cost-effective and unlikely to meet cost-effectiveness criteria in the future.

As a result of these issues, the evaluation team addressed the following strategic evaluation objectives (also outlined in Table 1-2):

- Section 3.1 on cost-effectiveness discusses incremental costs for qualified water heaters and customer expectations concerning the existing rebates.
- Section 3.2 on strategic directions presents industry trends in the use of water heating as part of efficiency and carbon-reduction programs.
- Section 3.2 also presents results from consumer research to explore potential customer engagement with—and needs from—any future water heating programs that incorporate electric thermal storage into their offerings.

The findings presented below are based on:

- Secondary research on current and anticipated future roles of water heaters in utility programs and associated use of evolving technologies;
- Two focus groups of Xcel Energy customers—one involving recent program participants and one involving customers who had been identified as using electric water heaters;
- Telephone interviews with 40 participating customers (same group as discussed in Chapter 2; and
- Telephone interviews with 17 trade partners (same group as discussed in Chapter 2).

Key findings, discussed in more detail below, are:

- Xcel Energy's Water Heater Rebate program is not cost-effective as it is currently structured.
- A light investigation into incremental costs for qualifying water heaters proved inconclusive and, therefore, does not shed light on whether assumptions match actual marginal costs.
- Recent program participants (i.e., customers who just benefited from the existing program) do support the current rebate structures and eligibility criteria in favor of a shift toward newer technology.[5]
- The utility and energy efficiency industry in general are moving toward rebates of heat pump water heaters in the near term and are gearing up to incorporate electric thermal storage using residential water heaters into long-term efforts to meet efficiency programs' and statewide carbon reduction goals.
- Xcel Energy customers with electric water heaters seem open to the idea of water heater-based storage and allowing some changes to when their water heater reheats, but motivators to participate in such a program, capacity to shift hot water use, and levels of information

[5] Readers should note that this evaluation did not explore preferences among customers or Minnesotans overall, but only recent program participants.

needed to consider participation in such a program vary by customer. Programs with options for customers are likely to appeal most broadly.

3.1 Cost Effectiveness

Xcel Energy's computations indicate that the existing water heater rebates are not cost-effective. For the 2017-2019 triennium, program assumptions filed with the State of Minnesota indicated a societal benefit-cost test value of 0.68. Among the four cost tests applied to the program, only the utility cost test showed as positive with a value of 1.03.

Xcel Energy staff indicated that sustained low natural gas prices contribute to the negative cost-effectiveness values, but the program continues to be offered because there is a perception that water heater rebates are a core efficiency offering and that Minnesota residents expect it to be offered. However, the low cost-effectiveness limits the size of rebates the program can offer and the rebates' effectiveness at influencing consumer choices.

The evaluation team explored two issues related to cost-effectiveness—incremental installed cost and customer expectations—with somewhat inconclusive results. These explorations were not central to the evaluation research, but existing interviews with participating trade partners and customers provided an opportunity to explore these issues in a limited way.

Installed and Incremental Costs

Current program assumptions assign assumed installed costs of $1,155 and incremental costs over non-rebated alternatives of $223 for medium-draw storage tank water heaters. For the less commonly installed fast-draw storage and tankless water heaters, assumed installed costs and incremental costs are even higher (at $1,334 and $402 for fast-draw storage models and $1,540 and $608 for tankless). These values affect cost-effectiveness calculations.

A limited search of water heater offerings by big box stores in the Twin Cities area suggests that the (uninstalled) purchase price for rebate-eligible water heaters and the price differentials among qualifying and non-qualifying models are both lower than program assumptions. At one store, qualifying storage tank water heaters from nationally recognized manufacturers were available in the $600 to $800 range, while non-qualifying storage tank water heaters with similar warranties were available between $500 and $850. Admittedly, these costs do not include installation or mark-ups that trade partners may apply.

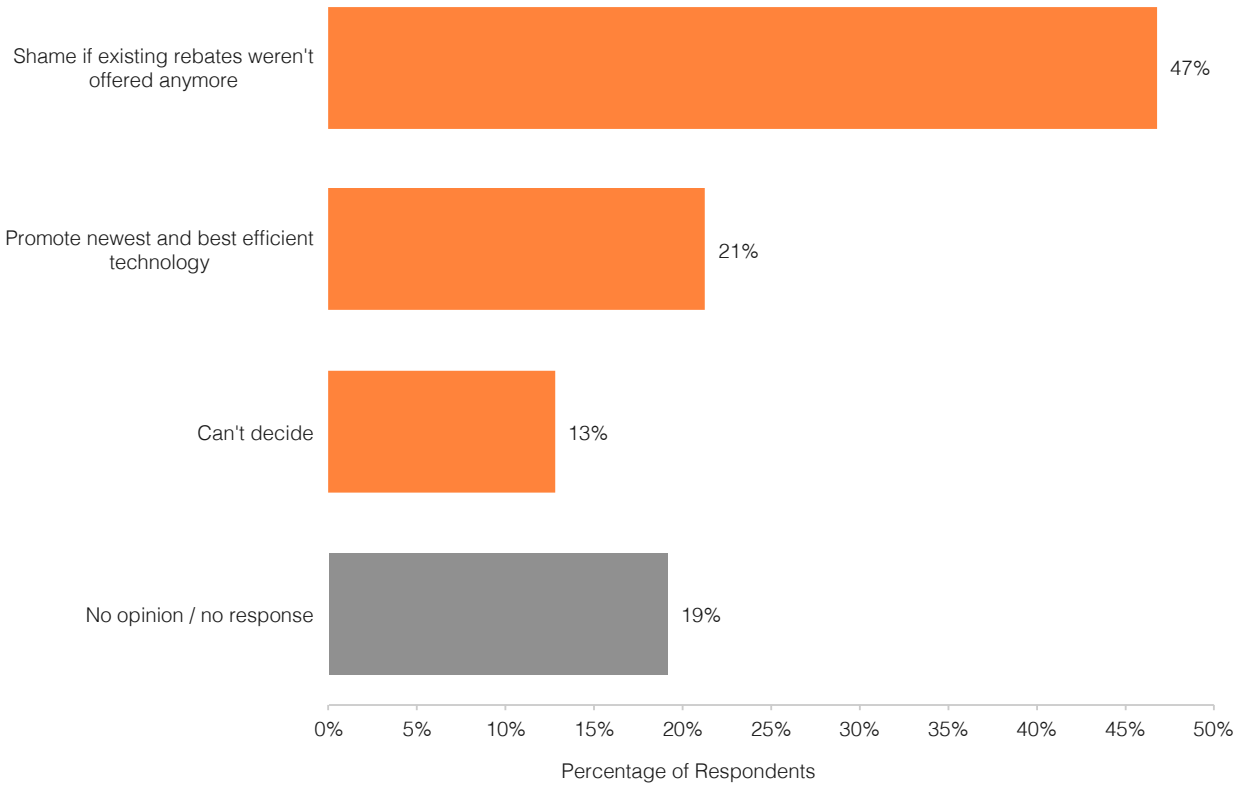
The evaluation team sought more clarity on incremental costs from trade partners during the interviews. Responses were inconclusive on marginal costs, but noteworthy nonetheless. When asked directly about incremental costs for qualifying water heaters, trade allies that provided responses offered a huge range from $50 to $1,000 and a median value of $575. Elaboration by a few of the trade allies suggests diverse interpretations of what constitutes efficient and qualifying water heaters. Four of the trade allies spoke specifically of power-vented water heaters (a distinguishing characteristic for CenterPoint Energy rebates, but not for Xcel Energy's) and seemed to include the cost of installing new venting systems alongside the water heaters. Others appeared to be thinking specifically of tankless water heaters. While inconclusive, the responses provided by trade partners hint that incremental costs may not be well-understood and warrant some more

investigation. Furthermore, differences in water heater rebate requirements between Xcel Energy and CenterPoint may not be clear or top-of-mind to some trade partners.

Customer Expectations

The evaluation team also took advantage of the interviews with participating customers to explore their expectations concerning the presence of the water heater rebates. Readers should keep in mind that these results are limited to customers who had just received an existing rebate, so results would be most meaningful if this customer group did not expect those rebates to continue. However, they showed a preference for the existing rebates over a shift to newer water heating technologies. As shown in Figure 3-1, nearly half of the participants interviewed for this evaluation thought it would be a shame if existing rebates were not offered anymore, while only a quarter thought rebates should go to the newest and best efficient technology. It is also worth noting that many of these respondents relied on trade partners or retailers to inform them about the available rebates, so these rebates were not something they were tracking closely.

Figure 3-1. Participant Expectations Concerning Existing Water Heater Rebates (n=40)



3.2 Strategic Direction

Knowing that the current program is not cost-effective and that electric water heating customers are not currently served by the program, the evaluation team investigated industry trends and alternative directions that Xcel Energy could take its Water Heater Rebate program. This exploration included a review of industry publications and presentations to identify trends in water heating technology and applications and two focus groups to provide input on the parameters of one particular direction that water heater programs might go. This potential approach would employ and provide customer incentives for timed reheating of hot water in storage tanks to coincide with more efficient, less costly, and/or less carbon intensive energy generation.

Industry Trends

General industry trends for water heating and water heater efficiency programs point toward new technologies. In the near term, water heater efficiency programs appear to be shifting toward heat pump water heaters. These water heaters are already being promoted in New England, Colorado, and the Pacific Northwest either in lieu of or in addition to high-efficiency natural gas water heaters.

At the same time, there appears to be a longer-term focus on communicating, web-integrated water heating that responds to grid needs and price signals within the energy and water heating industries. These shifts are being spurred by shifts toward grid-integrated appliances, beneficial electrification to help meet carbon-reduction goals, and shifts toward time-of-use or real-time pricing. This evaluation does not intend to suggest fuel switching is a viable option for Xcel Energy at this time, but does refer to other jurisdictions where programs that allow fuel switching (or intend to do so) inform the offerings available to customers with an electric water heater. Specific indicators toward this trend include:

- Numerous presentations at the American Council for an Energy-Efficient Economy's Hot Water Forum 2018 about water heating technologies that allow for grid interconnections.
- A substantial initiative by the Electric Power Research Institute (EPRI) toward beneficial electrification. EPRI has modeled potential shifts in electric end-use technologies in the next three decades and is planning state-specific assessments.
- An assessment by Lawrence Berkeley National Laboratory (LBNL) of drivers, barriers, prospects, and policy approaches to electrification in its report, *Electrification of Buildings and Industry in the United States*. LBNL stated that grid-connected electrification is likely to continue under current policies and assessed the opportunities to further beneficial electrification in buildings and industry.
- Major shifts toward renewable generation and aggressive carbon reduction goals in several states including California, which is heavily promoting net zero energy buildings to support aggressive state policies on carbon, shifting toward all-renewable electric generation, and taking steps through the California Public Utilities Commission toward transportation electrification.
- Regulatory Assistance Project assessments of the aggregation potential of water heaters and their potential contribution to beneficial electrification.
- Action planning by the Northeast Energy Efficiency Partnerships to accelerate "strategic electrification" to help meet regional carbon goals.

The various explorations of beneficial electrification all point to heat pump water heating as one of three residential end-uses with substantial opportunities and societal benefits. The other two residential opportunity areas are electric transportation and space heating.

Various relevant policy discussions are underway in Minnesota as well that may identify future directions of utility efficiency programs in Minnesota. There appear to be discussions and considerations concerning fuel switching, temporal and locational benefits of energy efficiency, the role of carbon in assessing the benefits of efficiency, and stakeholder reactions and potential actions towards electrification. Furthermore, the current statewide potential study included a preliminary recommendation that utility programs to encourage electrification and demand response should be incorporated into the state's regulatory framework as part of a shift toward an integrated demand-side management approach, albeit with appropriate distinction from traditional energy efficiency in tracking and reporting.

Electric Thermal Storage

One possible approach for water heater programs by utilities with growing wind generation is the integration of timers on customers' existing electric water heaters. Great River Energy already has a long history of providing large electric water heaters and timing controls to customers, and Xcel Energy has begun looking into electric thermal storage opportunities as the share of its wind-based generation continues to grow.

Timed operation of electric water heaters allows for the aggregation of thermal storage of electricity across participating households. The electricity needed for the water heating can be provided at night when lower-cost, wind-generated power is available. The use of timers, oversized storage tanks, and/or superheated water with mixing valves allows the hot water to be stored and offset water heating that would otherwise have occurred during daytime hours. This arrangement provides benefits for the grid and society, for ratepayers overall, and for individual customers who choose to participate in the water heating storage programs. The grid benefits from a more even match of electricity demand and supply as well as the facilitation of no carbon generation, which supports societal goals in the same way as electricity conservation. Ratepayers benefit from lower generating costs. Participating customers benefit from utility inducements provided for participation and through lower costs if they use time-of-use rates.

The evaluation team conducted two focus groups on August 22, 2018, in St. Louis Park, Minnesota, to further explore customer interest, willingness to engage with a water heater storage program, and program design characteristics that would appeal (or not) to potential customers. Table 3-1 summarizes the focus group characteristics and discussion topics. As noted, one group consisted of recent participants in the existing Water Heater Rebate program, all of whom use natural gas to heat their water; discussion topics for this group focused on general issues of water use. The second group consisted of households that have participated in an Xcel Energy showerhead program and had been identified as using electric water heating; discussion topics with this group also covered issues of program design, motivation, barriers, and messaging. Both groups were recruited by telephone from within the Twin Cities metro area.

This was a modest-sized effort intended to provide qualitative input for exploratory purposes. Generally, two focus groups provide allow the identification of the range of perceptions, thoughts, and preferences among applicable customers. However, two groups may not be sufficient to hone in

on patterns and trends in the larger population. Additional focus groups or individual interviews would be appropriate to vet program ideas and concepts before any piloting or program roll-outs.

Table 3-1. Focus Group Description and Topics

Group Characteristics and Topics Covered	Focus Group 1	Focus Group 2
Participants	10	9
Group Description	Xcel Energy Water Heater Rebate program participants	Xcel Energy Showerhead program participants; identified as electric water heater users
Hot water use	X	X
Perceived spending on hot water	X	X
Willingness to cede control		X
Motivation to participate		X
Program design input		X

Overall Focus Group Themes

One primary theme from the focus group research was that, while customers with electric water heaters seemed open to the idea of a water heater storage program, no single program approach or strategy for program messaging will appeal to all potential participants. Focus group participants differed in:

- The level of detail they would want about how such a program would work;
- Preferred program designs; and
- The drivers that may motivate their participation.

As a result, a program design that allows for some degree of customer choice may be best and could maximize interest and participation. The subsections below present several key considerations.

In addition, program design considerations would need to consider various filters that effectively weed out potential participants. These include:

- Water heating fuel—Only 10-12% of Xcel Energy customers use electric water heating, so a program targeting existing electric water heaters would be limited to a modest share of Xcel Energy customers.
- Willingness and ability—Customer motivation and ability to absorb the trade-offs involved in heating water only during off-hours varies; for some customers—particularly those with high daytime hot water usage—participation may be infeasible or impractical.
- Sufficient benefit from incentives or altruistic motivation—Both direct financial incentives and the idea that customers can help support renewable generation motivate customers. As with most programs, the share of customers who would seriously consider program participation depend on individual considerations of perceived benefits compared to any hassle factor, risk, or inconvenience.

- Follow-through—Only a share of customers with the intention of participating will actually follow through, thereby resulting in some additional drop-off in potential participation levels.

Hot Water Use

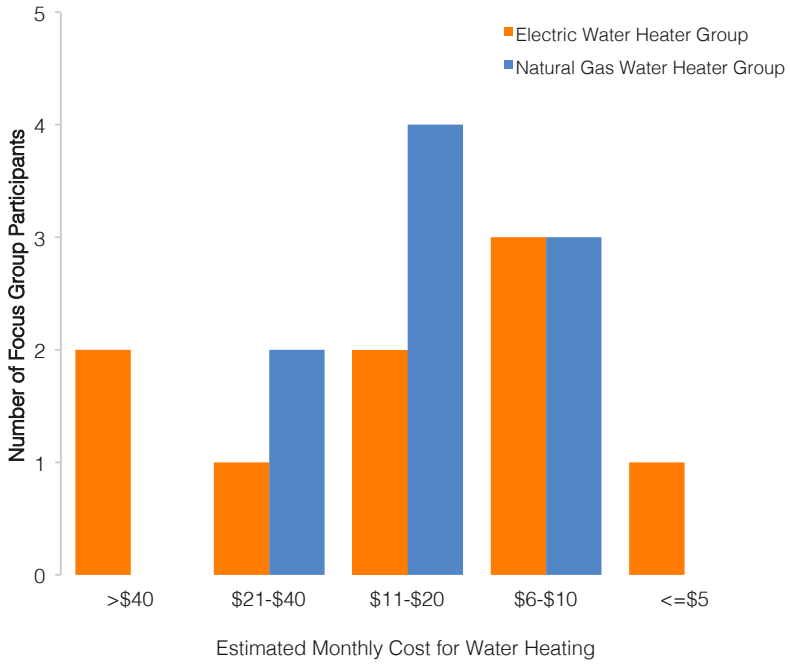
The evaluation team asked both sets of focus group participants about their daily use of hot water in order to better understand their daytime needs and potential concerns about running out of hot water if their water heater does not reheat until evening or nighttime. Self-reported about prior day usage and weekly or seasonal variation suggest that:

- Customer's actual (or perceived) hot water usage is bimodal with most major hot water usage occurring in the morning and evening hours. As might be expected, showers and getting ready for the day dominates morning usage, while cooking, dishes, and sometimes laundry dominate evening usage. For some households, morning activities do extend past 9 a.m., while others begin evening activities in the late afternoon (before 5 p.m.). Most households use hot water again at least by mid-evening.
- Most of the focus group participants have modest hot water usage between their morning and evening routines. (The focus groups included few, if any, households with pre-school children, however, and only a limited number of participants who appear to have an extensive daytime presence in their homes.)
- Weekend needs differ from midweek needs. Schedules tend to run somewhat later, and some non-daily activities, such as laundry, occur more frequently on weekends.
- Several participants in each group (2-4 per group) had exhausted their existing hot water supply in recent memory. While these participants appeared nonchalant about running out of water, the past experience makes it a real possibility that needs to be addressed if these households are to consider giving up recharging their hot water during the day.

Perceived Spending on Hot Water

The evaluation team asked focus group participants how much they think they spend on water heating each month. This perception matters because financial incentives for participation will be interpreted within the context of perceived spending on this particular end-use. On average, focus group participants think they spend between $11 and $20 monthly on hot water. This was true of customers with electric and natural gas water heating. However, those with electric water heaters provided much wider ranges of estimates than their peers with natural gas water heaters. Some who heat with electricity estimated monthly costs as low as less than $5, while others thought they spend more than $40. (See Figure 3-2.)

Figure 3-2. Perceived Water Heating Costs by Focus Group Participants



Willingness to Cede Control

Customer willingness to cede control over water heating to their utility (or to a timed schedule) is a key prerequisite for a water heater storage program to work. Participants in the focus group of electric water heating customers (group #2) seemed conceptually willing to cede control, particularly when the program concept was explained as functioning similarly to Xcel Energy's saver switch, which allows the utility to cycle air conditioners. However, details matter, and customers had many questions, especially:

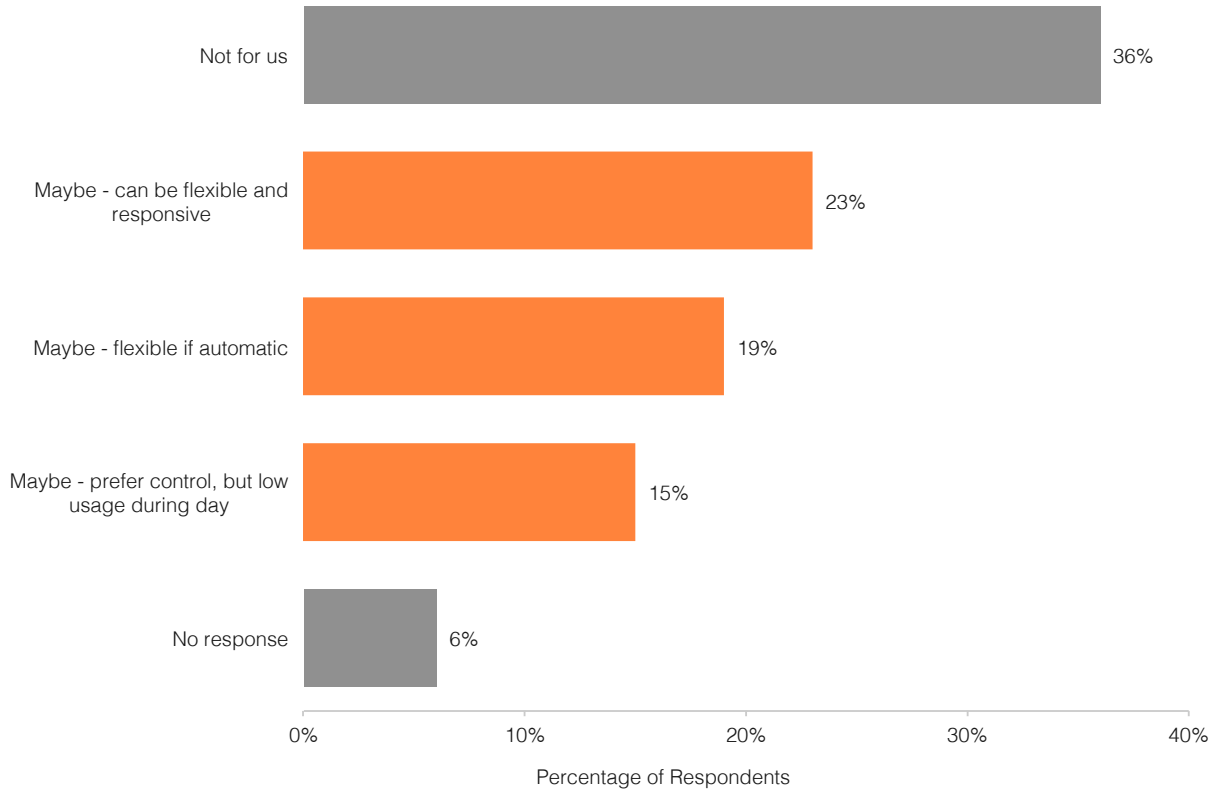
- Just how closely would Xcel Energy monitor our activities and intrude on our privacy?
- What is the time period that the water heater would not reheat?
- Is there an override?
- How much hot water would be available? (One potential participant suggested he would consider the program if it provided an 80 gallon tank.)

The level of detail that customers need about the potential program and how their water heating would work varied from focus group participant to participant, so Xcel Energy would need to be able to communicate at both high levels *and* with substantial detail. One focus group participant, for example, pointed out that water heaters replace any water drawn from the storage tank with cold water and wondered how much that diminishes the actual capacity.

During telephone interviews, program participants also suggested some willingness to cede control on electric usage generally, but with various levels of flexibility. As shown in Figure 3-3, slightly

more than half of interviewees indicated that they might consider an Xcel Energy program that asks them to shift generic electricity usage away from daytime hours. There are differences in this group, however. Some customers can be flexible and responsive, while others would want the shifted usage to happen automatically and not involve them directly. Finally, some could shift usage simply because they don't need much electricity during the day.

Figure 3-3. Program Participant Ability to Shift Electric Usage (n=40)



Motivation to Participate

Focus group participants seemed to respond to both personal and altruistic motivations for considering potential participation in a water heater storage program. While all participants showed interest in individually-focused incentives, such as bill credits, several also appreciated the societal value of facilitating more use of wind power and might respond based on such societal benefits. Focus group participants discussed how the program would benefit Xcel Energy and recognized that there is a benefit to the utility as well. As such, participants recognized a win-win-win benefit to a water heater storage program that provides direct inducements to participants. The customers, the environment / society, and the utility all stand to benefit. Program messaging could emphasize the wide-ranging benefits in such terms.

Program participant interviews also supported the concept that societal benefits of increased renewable energy are beneficial for program marketing. A quarter of respondents revealed an unaided preference for renewable energy when asked whether they cared where their electricity came from.

4. CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the evaluation team's key findings and associated recommendations regarding the Xcel Energy Water Heater Rebate program in Minnesota. This discussion is separated into the two main evaluation components—the process evaluation of the existing program and the strategic evaluation of potential future directions. Recommendations and suggestions follow the key findings.

4.1 Current Program

- Key Finding 1: **Participating customers and active trade partners are happy with the program and processes are functioning smoothly for them.** Customer satisfaction is high with more than four-fifth of participants expressing satisfaction on each of the customer satisfaction metrics measured, and suggestions for improvements focused merely on promoting or increasing the rebate and paying it faster. Similarly four-fifth of active trade partners rated their satisfaction with the program a 4 or 5 on a 5-point scale. Trade partners reported that the application process is easy. This is particularly true for trade partners using the online application.
    - **Recommendation 1.1: Promote the online application to trade partners who are not already using it.** One key advantage of the online application is the reduced back-and-forth needed with customers for their signature, and not all trade partners are aware of this feature.

- Key Finding 2: **Denied applications for ineligible models are higher for the Water Heater Rebate program than for other Xcel Energy rebates (as high as 20-30% of applications at peak times) and elevated by changes in program criteria for water heater eligibility. Denied applications can lead to customer dissatisfaction and originate disproportionately from installations by inactive trade partners.** Of five customers with denied applications interviewed for this evaluation, two expressed disappointment—one with Xcel Energy for not having communicated sufficiently about the denial and one with the trade partner for having misinformed the customer. Trade partners indicated having been caught off-guard by program changes—not necessarily due to lack of communications from Xcel Energy, but sometimes because of their own internal communications flows.
    - **Recommendation 2.1: Conduct "early warning" analysis of incoming applications, particularly after program changes, to identify trade partners associated with ineligible applications.** Early warning analysis would allow for additional outreach to targeted trade partners to overcome any communications gaps.
    - **Recommendation 2.2: Consider more personalized outreach to customers whose applications are denied.** More personalized outreach than existing form letters and e-mails could soothe the small number of customers who may otherwise be left unsatisfied, but the outreach would need to be done for all denied customers because it is impossible to predict who would be left dissatisfied and who would take the news in stride.

- Key Finding 3: **Less active trade partners generally engage with the program infrequently because their geographic focus falls outside of Xcel Energy's natural gas service area and because they emphasize less efficient (i.e., ineligible) models.** Opportunities to increase their participation levels rest primarily on shifting their focus to higher efficiency levels.
    - **Recommendation 3.1: If program growth is desired, increase outreach and education to less active trade partners to encourage promotion of higher efficiency water heaters and the use of the rebates.** Because these trade partners also serve other utility service areas, this outreach could be coordinated with neighboring utilities.

4.2 Future Program Considerations

- Key Finding 4: **The water heater rebates are currently not cost-effective, and the associated modest rebate levels are too low to influence most participants' chosen efficiency levels.** Despite this, Xcel Energy continues to offer water heater rebates because of the perception that Minnesotans expect water heater rebates as a core efficiency program offering.
    - **Suggestion 4.1: Xcel Energy could restructure its involvement in the water heater market and its engagement with customers on water heating.** Possibilities include moving toward newer technologies and future approaches, such as promoting heat pump water heaters or incorporating a hot water storage program that aggregates thermal storage among participating households for customer, ratepayer, grid, and societal benefit. Other possibilities within the current program structure include incorporating health and safety benefits of power venting and aligning the Xcel Energy program more with CenterPoint Energy's offerings or revisiting marginal cost assumptions (based on additional research).

- Key Finding 5: **There appears to be sufficient openness among customers to a water heater storage program to warrant designing and piloting such an offering.** Market trends indicate increasing societal, utility, and customer benefit from the use of water heaters for energy storage. Customers engaged during the research seem open to water heater-based storage, although customers are not currently actively seeking such storage for their own benefit. Providing sufficient inducements based on customer self-interest and altruistic benefits is key to attracting customer attention, and providing assurance and program mechanisms that keep customers from running out of hot water are important to maintain interest. The degree of customer flexibility and information needs vary, so program designs with built in flexibility and customer choices, including overrides to allow immediate water heating, should increase participation. Marketing messages would need to be able to explain the program succinctly for customers who only need a short description, but also answer fairly detailed questions for other potentially interested customers who want to know just how the program and their water heating would work. Specific program designs would benefit from vetting through additional customer research.
    - **Suggestion 5.1: If Xcel Energy initiates a water heater storage program, such an offering should be piloted with flexible designs and participant choice to broaden the appeal.** In the short run, Xcel Energy should emphasize personal and societal benefits in marketing messages. The program can count on some flexibility

from participants, but would have greater appeal if there are clear mechanisms in place to ensure customers do not run out of hot water when it would be inconvenient to do so. In the long run, Xcel Energy should consider links to rate designs, use of heat pump water heaters, and align with other industry trends.

EMI CONSULTING

Xcel Energy
Minnesota Water Heater Rebate Program 2018 Evaluation

December 10, 2018

APPENDICES

Presented To:

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APPENDIX A – EVALUATION PLAN SUMMARY

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, the EMI Consulting evaluation team conducted a process and strategic evaluation of the Xcel Energy Water Heater Rebate program in Minnesota. This document summarizes the evaluation plan, which was based initially on the original scope of work, staff feedback during the evaluation kick-off meetings, and staff interview findings, and included mid-project adjustments based on the research activities. This summary includes the following sections:

- Program Overview
- Evaluation Overview
- Data Collection Activities and Sampling Plans

Program Overview

Xcel Energy's Water Heater Rebate program has offered rebates to residential customers who install qualifying water heaters since 1997 with an interruption in 2005 and 2006. Rebates of $75 are available for storage tank water heaters and $250 for tankless water heaters. Minimum efficiency levels are based on Unified Energy Factors (UEF) and must be at least 0.64 for medium-draw storage units, 0.68 for high-draw storage units, or 0.87 for tankless models.

Storage units comprise 90% of rebated water heaters. Xcel Energy estimates that they save around 25 to 35 therms annually compared to baseline models and cost between $200 and $400 more. Tankless units comprise fewer than 10% of rebated water heaters. Xcel Energy estimates that they save around 90 therms annually and cost about $600 more.

The program has exceeded participation and energy savings goals most years, as shown in Table 1, but has proven to be cost-ineffective due to low prices of natural gas. Program marketing occurs primarily through participating trade partners—2/3rds of applications list a trade partner—and point-of-purchase materials in plumbing aisles of some big box hardware stores in Xcel Energy's service area. However, marketing has not been a priority due to the program cost-ineffectiveness.

Table 1. Participation and Energy Goals and Actuals - 2017

		Goal		Actual	
A.1	Participation	A.2	948	A.3	1,621
A.4	Natural Gas Savings (dekatherms)	A.5	3,053	A.6	5,215

Xcel Energy participant classifications into CAMEO groups suggest that participants are disproportionately homeowners with above average incomes. The vast majority of rebated units heaters are replacements of failed or failing water heaters.

While Xcel Energy is committed to promoting efficient water heating to its customers, the company wished to explore broader, cost-effective ways to provide value to customers through water heating-related initiatives.

Evaluation Overview

The 2018 evaluation consisted of a process evaluation and formative strategic exploration concerning the program's potential use for electric thermal storage. This section presents the evaluation objectives and research questions, which were developed jointly with Xcel Energy and informed by the evaluation kickoff meeting and subsequent staff interviews. It is followed by a more detailed description of the evaluation activities.

Table 2 presents the evaluation objectives in priority order and research questions associated with each objective.

Table 2. Evaluation Objectives and Research Questions

Research Objectives	Research Questions
High priority **1)** Inform opportunities for the program to offer electric thermal storage to customers with electric water heating	
(Research questions in descending order of priority)	• What are key considerations for customer acceptance and interest in an electric water heater thermal storage program? • What are common elements of electric thermal storage efforts elsewhere, including learning from electrification studies (in California, northern Europe, etc.)? • What technology is being developed? • How are state policy goals concerning carbon being addressed through better management of electric end-uses and/or electrification? • What technology is already available and in use that allows for electrical thermal energy storage? • What are the potential energy savings, carbon savings, and non-energy benefits of controlled electric water heaters?
Elevated priority **2) Assess participating customer satisfaction with the existing program offerings**	
	• What is customer satisfaction with the program and program elements? • What is the cause of high does-not-qualify rates among customer applications? What would be required to reduce the rate and how does that improve customer satisfaction? • What is the program's net promoter score?

Research Objectives	Research Questions
	• How important are water heater rebates to customers?
Elevated priority **3) Obtain trade partner perspectives on the program**	
Participants	• What aspects of the program do participating trade partners find helpful? • Do trade partners consider the rebate influential in affecting customer decisions? • What aspects of the program do trade partners think could be improved? • What are the incremental costs of the rebated water heaters compared to alternatives?
Non-participants	• What is program awareness among non-participating trade partners? • What are non-participating trade partner perceptions of the program? • What would it take for non-participants to make use of the program? • How do HVAC and plumbing-only contractors differ on these questions?
Medium priority **4) Compare Xcel Energy program to peer utilities**	
	• Are there cost-effective electric water heater programs? What is their design and what makes them cost-effective?
Medium priority **5) Obtain a deeper understanding of the customer process and journey for water heater replacements**	
	• What prompts a water heater replacement? • What steps do customers take? • What information sources do they use? • Do they engage retailers, HVAC/plumbing contractors, and/or plumbers? How many? • What do they hear from the professionals they contact? • How do they rate key decision factors in their choice of their replacement water heater? • Are they aware of Xcel Energy rebates? Where do they fit into the process and priorities?

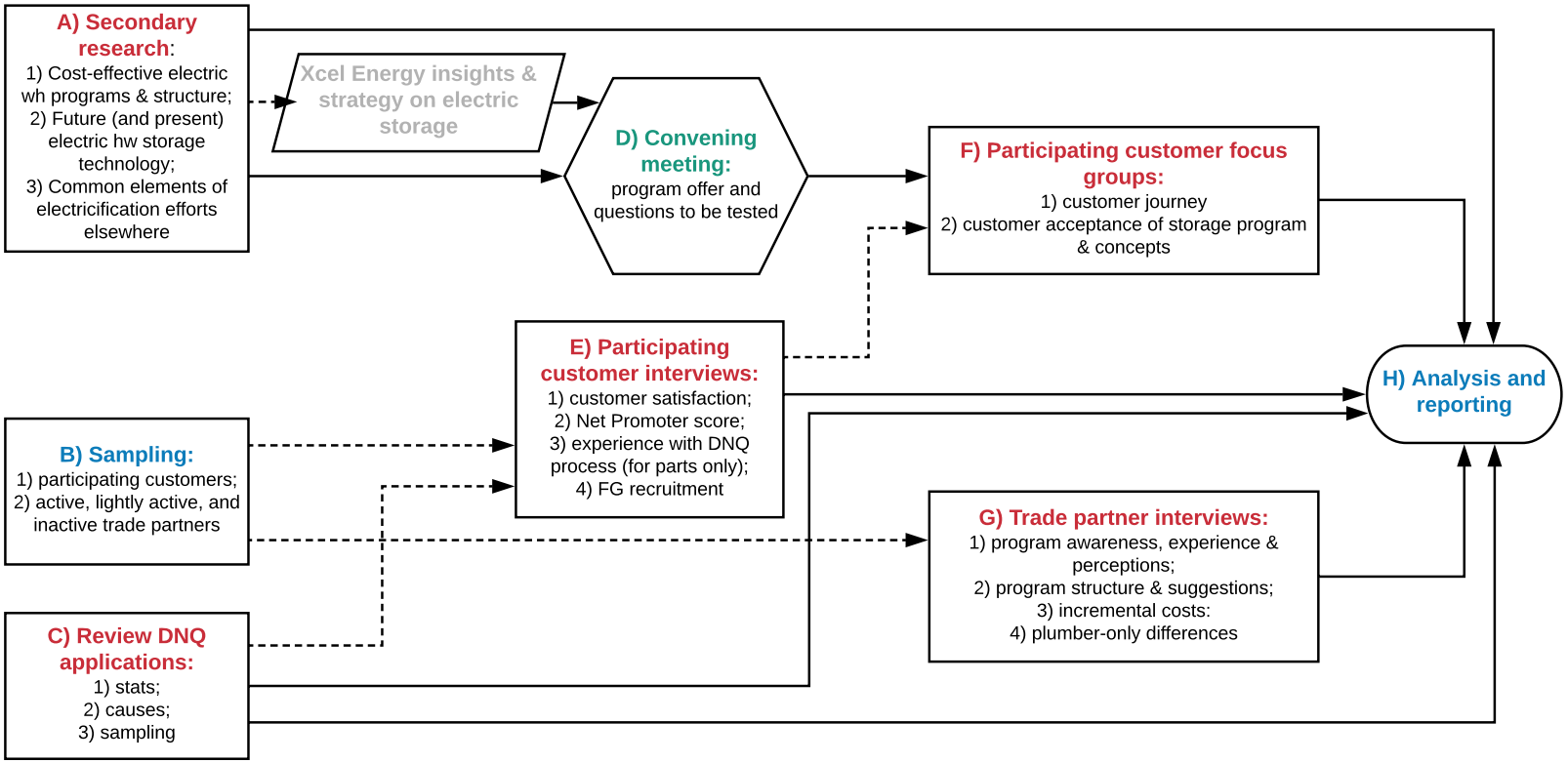
Data Collection Activities and Sampling Plans

To meet the above objectives, the evaluation team conducted a variety of data collection activities. These are listed in Table 3, presented visually in a project flow diagram in Figure 1, and explored more in remaining sections. The table identifies sample sizes and links activities to evaluation objectives. The figure illustrates task sequences and relationships. Note that these evaluation activities differed from those of other evaluations the evaluation team conducted for Xcel Energy because the nature of some key research objectives was more formative and explorative in nature.

Table 3. Evaluation Task Summary

Evaluation Task	Sample Size	Task Role in Addressing Evaluation Objective(s)
Staff Interviews	6	Inform evaluation priorities and plan
Secondary Research	n/a	Compare program to peer utilities on cost-effectiveness Inform potential use of water heater program for electric thermal storage
Review Rejected (DNQ) Applications	50	Inform customer satisfaction with the program (limited to DNQ customers)
Convening Meeting	1	Inform participant focus groups that will test program options or concepts.
Participant Interviews	47	Assess participant satisfaction and DNQ experiences (subset of interviews), compute net-promoter score, and serve as screening and recruitment vehicle for focus groups
Participant Focus Groups	19 participants, 2 groups	Explore and understand customer journey during water heater replacement Test prospective customer reactions and acceptance of potential water heater program offerings with an electric thermal storage component
Trade Partner Interviews	17	Understand trade partner awareness, experience, perceptions, and suggestions for the program Explore incremental costs of qualifying water heaters Explore and confirm perceived differences between plumbing-only trade partners and those who provide HVAC services as well

Figure 1. Evaluation Project Flow Diagram



Staff Interviews

In March 2018, the evaluation team interviewed seven Xcel Energy staff (in six interviews) to inform this evaluation plan, discuss program goals, and review program processes, challenges, and successes. Those interviewed included the current product manager, the team lead, the primary engineer, the trade partner channel manager, the team lead of the rebate processing unit, and a member of the regulatory team involved in exploration of electric thermal storage. They were conducted in person in Minneapolis. These meetings, combined with the kickoff meeting, allowed the evaluation team to create a focused evaluation plan and data collection activities. A subsequent exchange with members of the Xcel Energy team led to a consensus on evaluation priorities addressed in this plan.

Secondary Research

The evaluation team conducted exploratory secondary research to provide context on industry trends and water heater program directions. Because these investigations were exploratory, we defined the level of effort in terms of staff hours rather than number of documents reviewed or interviews completed. Table 4 summarizes our initial plans and anticipated level of effort for each inquiry.

Table 4. Secondary Research Information Sources and Level of Effort

Research Topic	Anticipated Hours	Initial Information Sources
Cost-effective electric water heater programs	16-24	• National lists of energy efficiency rebate programs, such as the Database of State Incentives for Renewables & Efficiency and the Energy Star Rebate Finder • Search of IEPEC and ACEEE conference proceedings • Inquiry to AESP leadership and relevant topic committees • Inquiry to E Source • Search of evaluation reports available at aggregated lists offered by California (CALMAC) and the Northeast (NEEP) • Follow-up interviews with program managers for any cost-effective electric programs identified
Technologies anticipated or available	16-24	• Search of ACEEE conference proceedings (with a focus on the water heater forum) • Inquiry to ACEEE program staff • Inquiry to relevant AESP topic committees • Inquiry to regional energy efficiency organizations exploring new technologies (NEEA, Midwest Energy Efficiency Alliance, NEEP, and California Emerging Technologies Program) • Inquiry to lead for Great River Energy's use of electric water heaters for storage • Inquiries to manufacturers of electric water heaters and industry groups representing the industry • Inquiry to EPRI
Common elements of efforts to better manage electric end-uses and/or	8-16	• Review of California policy documents and directives by CPUC and CEC • Review of industry literature and conference papers at IEPPEC

Research Topic	Anticipated Hours	Initial Information Sources
electrification		(the European equivalent of IEPEC) on electrification in Germany and Denmark • Inquiry to relevant California regulatory staff or utility program leads

Review of Rejected (DNQ) Applications

The evaluation team reviewed 50 applications submitted in 2017 that were rejected initially in order to characterize the issues, resolutions, and processes involved. These applications also served as a sample frame for the subset of customer interviews dedicated to DNQ applications. The evaluation team's characterization focused on:

- The degree to which DNQ applications are ultimately resolved (and result in a rebate) or remain rejected
- The share of DNQ applications originating from customer self-installs and from trade allies
- The apparent cause of the DNQ (correct model numbers that were not eligible for rebates, incomplete model numbers, incorrect model numbers, and other causes).

To conduct this review and analysis, the evaluation team requested a representative (preferably random) sample of 50 rebate applications submitted in 2017 that were initially rejected from Xcel Energy's rebate operations team.

Convening Meeting (Electric Thermal Storage)

The evaluation team facilitated a convening meeting with Xcel Energy staff involved in exploring electric thermal storage options through water heaters. The purpose of this meeting was to:

- Update Xcel Energy on the evaluation team's secondary research related to energy storage
- Hear from Xcel Energy on the company's latest thoughts on how a water heater energy storage program might be designed with an emphasis on customer-facing components and key unknowns
- Discuss and decide on program options or concepts to be tested in the upcoming focus groups.

The results of this meeting were a key input to the design of the subsequent focus groups.

The evaluation team planned for a web-assisted meeting with Xcel Energy staff participating in person and Evergreen evaluation team members connected via telephone and Go-To-Meeting or Skype.

Participating Customer Interviews

The evaluation team conducted telephone interviews of 47 customers who filed rebates in 2017 or early 2018. These interviews were semi-structured using a combination of carefully scripted customer satisfaction questions that were consistent with customer satisfaction inquiries for the other program evaluations and more open-ended questions with probing to explore experiences

with the rebate processing and asked exploratory questions related to electric thermal storage programs and customer journeys when purchasing water heaters. These latter questions provided context for subsequent focus groups and allowed the evaluation team to screen for good candidates to recruit into the focus groups.

Forty of these interviews were with standard participants whose initial rebate applications were processed successfully and resulted in a rebate; these customers were chosen randomly from among customers located in the greater Twin Cities area.[1] Seven of the interviews were set aside for customers whose initial rebate application was rejected; these customers were sampled from the applications the evaluation team reviewed in an earlier task.

Table 5. Participating Customer Interviews

Strata	Sampled Geography	Target Completions
Successful Participants	Metropolitan Twin Cities	40
DNQ customers	Statewide	7
Total		47

Participant Focus Groups

The Evergreen evaluation team conducted two focus groups with a total of 19 customers to explore customer journeys in water heating replacements and test reactions to potential electric thermal storage water heating program offers or program elements. Focus group participants were recruited from among eligible interviewees (see recruitment protocol) and would have replaced their water heaters in the prior 18 months so the experience and decision-making will still be accessible to recall (for one group) or are known to use electric water heaters (for the other group).

The focus groups were held on August 22, 2018, in St. Louis Park, Minnesota, and moderated by Evergreen's Ingo Bensch, the evaluation lead for this study. Xcel Energy staff were welcome to observe the focus groups. The moderated discussion was based on a guide developed with Xcel Energy input beforehand. The evaluation team also videotaped the focus groups to allow for subsequent viewing and analysis.

Separate discussion guides were created for the two groups; these are attached. The evaluation team budgeted for incentives of $100 to $150 for focus group participants.

Trade Partner Interviews

The evaluation team conducted 17 in-depth telephone interviews with trade partners to understand their perspectives, perceptions, experiences, and suggestions for the program. These interviews also

[1] The evaluation team singled out Twin Cities area participants to allow the interviews to serve as a recruitment tool for the focus groups as well. The evaluation team assumed that customer satisfaction for Twin Cities area customers would not differ in meaningful ways from that of the full set of statewide customers.

provided an opportunity to explore the perceived impact of the rebates on customers and marginal costs of qualifying water heaters, which have cost-effectiveness implications for the program.

To allow for comparisons between active and inactive trade partners and plumbing-only and HVAC & plumbing contractors, the evaluation team divided the sample into four groups, as shown in Table 6. Thereby, we included 10 plumbing-only trade partners for separate analysis and 10 inactive contractors for separate analysis.

Table 6. Trade Partner Interview Strata and Targets

Strata	Definition	Target Completions
Active – HVAC & Plumbing	10+ installations in 2017	5
Active – Plumbing-only	5+ installations in 2017	5
Inactive – HVAC & Plumbing	0-9 installations in 2017	5
Inactive – Plumbing-only	0-4 installations in 2017	5
Total		20

APPENDIX B – ACTIVE TRADE PARTNER INTERVIEW GUIDE

Introduction

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, members of the EMI Consulting evaluation team are conducting in-depth telephone interviews with Trade Partners. This guide presents the questions to be covered in the in-depth interviews for the Minnesota Water Heater Rebate program.

The Water Heater Rebate program has offered rebates to residential customers who install qualifying water heaters since 1997 with an interruption in 2005 and 2006. Rebates of $75 are available for storage tank water heaters and $250 for tankless water heaters. Minimum efficiency levels are based on Unified Energy Factors (UEF) and must be at least 0.64 for medium-draw storage units, 0.68 for high-draw storage units, or 0.87 for tankless models.

Storage units comprise 90 percent of rebated water heaters and tankless units comprise fewer than 10 percent of rebated water heaters. The program has exceeded participation and energy savings goals most years, but has proven to be cost-ineffective due to low prices of natural gas. Program marketing occurs primarily through participating trade partners—2/3rds of applications list a trade partner—and point-of-purchase materials in plumbing aisles of some big box hardware stores in Xcel Energy's service area. However, marketing has not been a priority due to the program cost-ineffectiveness. The targets of these interviews are currently **active** trade partners with the Water Heater product.

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

Interview Objectives

The objectives for the MN Water Heater trade partner interviews are to:

- Understand trade partner awareness, experience, perceptions, and suggestions for the program
- Explore incremental costs of qualifying water heaters
- Explore and confirm perceived differences between plumbing-only trade partners and those who provide HVAC services as well

Specific research questions for **active** trade partners are the following:

- What aspects of the program do participating trade partners find helpful?
- Do trade partners consider the rebate influential in affecting customer decisions?
- What aspects of the program do trade partners think could be improved?
- What are the incremental costs of the rebated water heaters compared to alternatives?

Fielding Instructions

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

- Attempt to reach each contact four times on different days of the week and at different times.
- Leave messages on the first and fourth attempt.
- Experienced interviewers should attempt to convert "soft" refusals [e.g., "I'm not interested", immediate hang-ups] at least once.
- Trade partner calling hours are 7 AM to 5 PM CDT.
- Definitions: COMPANY NAME = Update COMPANY NAME with Trade Partner's company name

If feasible, complete the following table before the interview based on information from the sample and a brief review of the company's web page.

Company Name:	
Lead Contact, if any, provided by Xcel Energy	
Contact name identified on web site and title	
Telephone number	
Location (city/ies)	
Area served (as defined on website)	
Last year of participation in Xcel Energy program	
Prior level of activity (range of # of projects /yr)	
Notes from review of website	

Record call attempts here

Date / time	Attempted contact	Telephone	Result

Interview Questions

Introductory text (use or modify as appropriate):

Hello, my name is _____ calling from Evergreen Economics on behalf of Xcel Energy. We are conducting an evaluation of Xcel Energy's water heater rebate program to provide input to their program team on the offerings and services. According to Xcel Energy records, you participate in the water heater program as a registered trade partner. Who could best tell me about that and about your experience with the program?

[If needed, transfer to a different contact and re-introduce]

I would like to conduct a brief interview with you about the program, your experiences with it, and your perspectives and practices generally. We are offering a $25 gift card as a thank you for your time. Your insights and perspectives will help Xcel Energy improve its services to trade partners and residential customers. Would you have [20-30 minutes] now?

[Note: If respondent is willing to complete only an abbreviated interview, emphasize questions A1, A2, A3, B4, B6, C2, C7, C8, D2, D3, D4, D5, and E1.]

Section A: Company Overview

A1. To start, please tell me a bit about your company.

Probe, as needed:

- What kinds of services do you provide? HVAC and plumbing or plumbing only? [Important to ask, especially if not obvious from the company name]
- What region do you serve?
- How long have you been in business?
- What is your role?

A2. What share of your work is water heater installations in residential homes?

A3. Do you install both electric and gas water heaters, or only one type?

Probe, for those that install both:

- Do you install more of one type than the other?
- Do you prefer to install one type over the other?
- Which do you tend to recommend to customers?

Section B: Program Awareness and Engagement

B1. How and when did you initially start offering Xcel Energy's water heater rebates to your customers?

Probe, as needed:

- How did you become aware of the program? *[Listen for whether they first started working with Xcel Energy rebates for other products or whether it started with the water heater program]*
- Do you work with any other Xcel Energy rebates or offer them to your customers? If so, which?

B2. Could you describe what involvement with Xcel Energy rebate programs as a contractor or trade partner involves?

Probe:

- In what ways do you interact with Xcel Energy about this program?
- What information or services to you receive from Xcel Energy (beyond the ability to offer rebates to your customers)?

B3. In what ways is the Xcel Energy water heater program helpful to you in your business?

Probe, as needed:

- rebate
- ability to mention the connection with the Xcel Energy program
- Xcel Energy messaging to customers on benefits of efficient water heaters

B4. Have there been any challenges in working with the water heater rebate program?

Probe:

- If so, what?
- What suggestions do you have to address those issues?

B5. Have you had any difficulty in filling out the rebate applications forms for customers?

Probe:

- If so, what was difficult or unclear?
- What suggestions do you have to address those issues?

B6. Is it clear to you which models qualify for Xcel Energy water heating rebates and which do not?

Probe:

- Is there anything Xcel Energy should do to more clearly communicate that?

B7. Do you have any suggestions for Xcel Energy's trade partner services and support—either overall or for the water heater rebate program specifically?

Section C: Program Role in Customer Interaction and Equipment Choices

C1. Next, I would be interested in hearing a little more about how your water heater replacement projects work beginning with that initial customer contact. How do you tend to find your residential water heater customers?

Probe on:

- What proportion of customers are replacing a failed water heater versus making an elective upgrade?
- Are they aware of the Xcel Energy rebates when you talk with them?
- What specifications, if any, do they generally ask for?

C2. What do you typically advise customers to buy when they need to replace a water heater, or what do you base your recommendations on?

Listen for / probe on:

- Storage versus tankless water heaters?
- Discuss UEFs or general efficiency levels?
- Discuss draw patterns or not that technical?
- Bottom line costs only or feature Xcel Energy rebate specifically?
- Mention connection with Xcel Energy program?

C3. At what point in the conversation do you mention available rebates to the customer, if at all?

C4. What share of water heaters that you sell to Xcel Energy customers qualify for the rebate?

C5. For what share of those qualifying water heaters do you and the customer end up filing for an Xcel Energy rebate?

C6. What role, if any, does the Xcel Energy rebate play in:

- spurring the customer to make the water heater replacement in the first place? (for elective replacements only)

- helping you get more work?
- prompting the customer to install a more efficient water heater than they would have done otherwise?

C7. For customers who upgrade to a more efficient water heater to qualify for the rebate, what is the typical cost difference between the efficiency level the customers are replacing and the one they buy?

C8. For customers who choose to remain with whatever non-qualifying efficiency level they already had, how much more would it typically cost for them to upgrade to a rebate qualifying efficiency level?

C9. Has participating in the water heater program changed the type of water heaters that you recommend to your customers?

Section D: Evolving Market Place

D1. Thinking more broadly beyond the Xcel Energy program, have you noticed any change in demand from customers for efficient water heaters over time?

Probe on:

- In what way?
- What is causing that?

D2. What do you see as the main trends in the market place for water heaters? [Probe on and listen for measures.]

Probe on (if not mentioned):

- What about storage versus tankless water heaters?
- What about higher UEF models?
- What about different draw patterns?

D3. How familiar are you with control technology on water heaters, either retrofit or OEM?

Probe on:

- What do you think of water heater controls?
- Have you installed a water heater with control technology or a control retrofit before?
- If water heater controls became more prevalent in the market, would you see yourself installing them?

D4. If Xcel Energy's water heater rebate program shifted to include controls, would that increase, decrease, or not change your involvement and use of the program?

Probe on:

- What would you need from Xcel Energy to participate in a program that emphasizes water heater controls?

D5. What do you think of heat pump water heaters?

Probe on:

- Do you install many of those? Why or why not?

Section E: Satisfaction

E1. Finally, I'd like to ask about your and your customers' satisfaction with the Xcel Energy water heater program. Please rate your overall satisfaction with the program on a 1 to 5 scale where 1 is not satisfied and 5 is extremely satisfied?

[IF E1<5] What could Xcel Energy do to increase your satisfaction with the water heater program?

E2. Have you had any feedback from your customers about their experiences with the water heater program that you think Xcel Energy should know?

E3. What do you think of the specific water heating equipment that is covered by the program?

E4. What do you think of the rebate levels?

E5. Aside from anything we've already discussed, was there ever an occasion when the water heater program didn't meet your expectations? Please explain.

Section F: Closing

F1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences with the Xcel Energy Water Heater program?

F2. And do you have a preference for receiving your [incentive] via US Post Office mail or via e-mail? [Get or verify appropriate address.]

Thank you. Those are all the questions I have. Xcel Energy appreciates your thoughtful responses and insights. You should be receiving [the incentive] in about [#] weeks.

APPENDIX C – INACTIVE TRADE PARTNER INTERVIEW GUIDE

Introduction

To support the process and impact evaluation of the 2017 Xcel Energy efficiency programs, members of the EMI Consulting evaluation team are conducting in-depth telephone interviews with Trade Partners. This guide presents the questions to be covered in the in-depth interviews for the Minnesota Water Heater Rebate Product.

The Water Heater Rebate program has offered rebates to residential customers who install qualifying water heaters since 1997 with an interruption in 2005 and 2006. Rebates of $75 are available for storage tank water heaters and $250 for tankless water heaters. Minimum efficiency levels are based on Unified Energy Factors (UEF) and must be at least 0.64 for medium-draw storage units, 0.68 for high-draw storage units, or 0.87 for tankless models.

Storage units comprise 90 percent of rebated water heaters and tankless units comprise fewer than 10 percent of rebated water heaters. The program has exceeded participation and energy savings goals most years, but has proven to be cost-ineffective due to low prices of natural gas. Program marketing occurs primarily through participating trade partners—2/3rds of applications list a trade partner—and point-of-purchase materials in plumbing aisles of some big box hardware stores in Xcel Energy's service area. However, marketing has not been a priority due to the program cost-ineffectiveness. The targets of these interviews are currently **inactive** trade partners with the Water Heater product.

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

Evaluation Objectives

The objectives for the MN Water Heater trade partner interviews are to:

- Understand trade partner awareness, experience, perceptions, and suggestions for the program
- Explore incremental costs of qualifying water heaters
- Explore and confirm perceived differences between plumbing-only trade partners and those who provide HVAC services as well

Specific research questions for **inactive** trade partners are the following:

- What is program awareness among non-participating trade partners?
- What are non-participating trade partner perceptions of the program?
- What would it take for non-participants to make use of the program?
- How do HVAC and plumbing-only contractors differ on these questions?

Fielding Instructions

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

- Attempt to reach each contact four times on different days of the week and at different times.
- Leave messages on the first and fourth attempt.
- Experienced interviewers should attempt to convert "soft" refusals [e.g., "I'm not interested", immediate hang-ups] at least once.
- Trade partner calling hours are 7 AM to 5 PM CDT.
- Definitions: COMPANY NAME = Update COMPANY NAME with Trade Partner's company name

If feasible, complete the following table before the interview based on information from the sample and a brief review of the company's web page.

Company Name:	
Lead Contact, if any, provided by Xcel Energy	
Contact name identified on web site and title	
Telephone number	
Location (city/ies)	
Area served (as defined on website)	
Last year of participation in Xcel Energy program	
Prior level of activity (range of # of projects /yr)	
Notes from review of website	

Record call attempts here

Date / time	Attempted contact	Telephone	Result

Interview Questions

Introductory text (use or modify as appropriate):

Hello, my name is _____ calling from Evergreen Economics on behalf of Xcel Energy. We are conducting an evaluation of Xcel Energy's water heater rebate program to provide input to their program team on the offerings and services. According to Xcel Energy records, you have installed efficient water heaters rebated by the Xcel Energy program. Who could best tell me about that and about your experience with the program?

[If needed, transfer to a different contact and re-introduce]

I would like to conduct a brief interview with you about the program, your experiences with it, and your perspectives and practices generally. We are offering a $25 gift card as a thank you for your time. Your insights and perspectives will help Xcel Energy improve its services to trade partners and residential customers. Would you have [15-20 minutes] now?

[Note: If respondent is willing to complete only an abbreviated interview, emphasize questions A1, A2, A3, A5, B2, B3, B7, C2, D5, D6, D7. Time permitting, focus on sections A, B, C, and D leaving section E for last.]

Section A: Company Overview

A1. To start, please tell me a bit about your company.

Probe, as needed:

- What kinds of services do you provide? HVAC and plumbing or plumbing only? [Important to ask, especially if not obvious from the company name]
- What region do you serve?
- How long have you been in business?
- What is your role?

A2. What share of your work is water heater installations in residential homes?

A3. What share of this work would you estimate includes a water heater that would qualify for Xcel Energy rebates? [If interviewee is not aware, do not probe. Instead, assess how familiar they are with the program and from what sources.]

- Probe, as appropriate:
- [if low qualification rate] What keeps these projects from qualifying for rebates?
- Do you generally file for rebates for the projects that qualify or generally not?

- [if not] Why not?

A4. Do you currently install water heaters for residential customers in Xcel Energy's service territory?

A5. Do you install both electric and gas water heaters, or only one type?

Probe, for those that install both:

- Do you install more of one type than the other?
- Do you prefer to install one type over the other?
- Which do you tend to recommend to customers?

Section B: Awareness / Impressions of Program

B1. Do you recall how you first heard of the Xcel Energy water heater rebate program and what prompted you to use it?

B2. What is (was) good about the program?

B3. What could be (could have been) improved?

[IF INTERVIEWEE HAS NOT USED THE PROGRAM, SKIP Q B4-B6]

B4. Did the program cause you to change what you offered or recommended to customers in any way? Probe: In what way?

B5. Did the rebates alter what customers were willing to do in any way? Probe: How?

Additional probes:

- Did it spur customers to make the water heater replacement in the first place? (for elective replacements only)
- Did it help you get more work?
- Did it prompt the customer to install a more efficient water heater than they would have done otherwise?

B6. When you have used the Xcel Energy water heater program, did you mention your involvement to customers directly?

Probe: How or in what context did you bring it up? Was that helpful to you? How?

B7. What would need to be different for you to promote Xcel Energy water heater rebates to customers more frequently?

Probe, as relevant (if there is openness to more activity, but no clear indication of what would make the program worthwhile): What difference would the following make?

- Higher water heater rebates
- Targeted advertising to customers in the areas served by participating contractors
- More contractor support from Xcel Energy

Section C: Customer Interaction and Equipment Choices

C1. Next, I would be interested in hearing a little more about how your water heater replacement projects work beginning with that initial customer contact. How do you tend to find your residential water heater customers?

Probe on:

- What proportion of customers are replacing a failed water heater versus making an elective upgrade?
- Are they aware of the Xcel Energy rebates?
- What specifications, if any, do they generally ask for?

C2. What do you typically advise customers to buy when they need to replace a water heater, or what do you base your recommendations on?

Listen for / probe on:

- Storage versus tankless water heaters?
- Discuss UEFs or general efficiency levels?
- Discuss draw patterns or not that technical?
- Bottom line costs only or feature Xcel Energy rebate specifically?
- Mention connection with Xcel Energy program?

C3. What, if anything, could Xcel Energy's water heater program do to help prep or prompt customers to upgrade to a more efficient water heater?

Section D: Evolving Market Place [time permitting]

D1. Thinking more broadly beyond the Xcel Energy program, have you noticed any change in demand from customers for efficient water heaters over time?

Probe on:

- In what way?
- What is causing that?

D2. What do you see as the main trends in the market place for water heaters? [Probe on and listen for measures.]

Probe on (if not mentioned):

- What about storage versus tankless water heaters?
- What about higher UEF models?
- What about different draw patterns?

D3. [IF INTERVIEWEE HAS COMPLETED REBATED PRJOECTS] For customers who upgrade to a more efficient water heater to qualify for the rebate, what is the typical cost difference between the efficiency level the customers are replacing and the one they buy?

D4. [IF INTERVIEWEE IS AWARE OF PROGRAM REQUIREMENTS] For customers who choose to remain with whatever non-qualifying efficiency level they already had, how much more would it typically cost for them to upgrade to a rebate qualifying efficiency level?

D5. How familiar are you with control technology on water heaters, either retrofit or OEM?

Probe on:

- What do you think of water heater controls?
- Have you installed a water heater with control technology or a control retrofit before?
- If water heater controls became more prevalent in the market, would you see yourself installing them?

D6. If Xcel Energy's water heater rebate program shifted to include controls, would that change your involvement and use of the program in any way? How?

Probe on:

- What would you need from Xcel Energy to participate in a program that emphasizes water heater controls?

D7. What do you think of heat pump water heaters?

Probe on:

- Do you install many of those? Why or why not?

Section E: Satisfaction [time permitting; skip if interviewee does not have sufficient program experience or background to answer]

E1. Finally, I'd like to ask about your and your customers' satisfaction with the Xcel Energy water heater program. Please rate your overall satisfaction with the program on a 1 to 5 scale where 1 is not satisfied and 5 is extremely satisfied?

[IF E1<5] What could Xcel Energy do to increase your satisfaction with the water heater program?

E2. What do you think of the specific water heating equipment that is covered by the program?

E3. What do you think of the rebate levels?

E4. Aside from anything we've already discussed, was there ever an occasion when the water heater program didn't meet your expectations? Please explain.

Section F: Closing

F1. Is there anything we didn't cover that you'd like to mention or discuss about your experiences with or thoughts about the Xcel Energy Water Heater program?

F2. And do you have a preference for receiving your [incentive] via US Post Office mail or via e-mail? [Get or verify appropriate address.]

Thank you. Those are all the questions I have. Xcel Energy appreciates your thoughtful responses and insights. You should be receiving [the incentive] in about [#] weeks.

APPENDIX D – CUSTOMER FOCUS GROUP MODERATOR'S GUIDE

Introduction

This guide will be used in two focus groups of Xcel Energy customers in Minneapolis in August 2018. The focus groups are intended to help inform future strategic directions of the Water Heater Rebate product in Minnesota as well as obtain insights on the current version of the product. The focus groups will draw from different audiences, but with some overlap in discussion content as noted in the table below.

Evergreen Economics and the focus group facility are recruiting 12 participants per group, but plan to seat 8-10 participants. (If needed, the focus group facility will excuse excess participants before seating the focus groups and pay the incentive for their efforts.)

Table 1. Focus Group Sample Sources and Major / Minor Discussion Topics

Group	Sample Source	Customer Journey / Decision-Making	Program Satisfaction	Water Heater Use	Thermal Storage Opportunities and Barriers
A	Program Participants (natural gas water heating customers)	**Major**	**Major**	Minor	
B	Showerhead Participants (electric water heating customers)			**Major**	**Major**

The focus groups are scheduled for August 22 at 5:30 pm and 7:30 pm at Leede Research, 5401 Gamble Drive, Suite 100, St. Louis Park, MN 55416.

Interview Questions

Introduction and Ground Rules

Group	Approximate Time	Cumulative Time	Notes
A	15 mins	15 mins	
B	15 mins	15 mins	

[Standard overview of purpose, client, and focus group ground rules to be added here]

Introduction and household basics (warm-up)
In the way of introductions, let's go around the room and have each of you tell us your first name, how many people live in your household, and how long ago you bought your current water heater.

Customer Journey & Decision-Making

Group	Approximate Time	Cumulative Time	Notes
A	25 mins	40 mins	
B	5 mins	20 mins	Short version

Group A version

Triggers for buying water heater *[Get volunteer responses. Cover entire room.]*
What prompted you to buy the water heater you recently purchased?

Key water heater attributes *[Get volunteer responses. Prompt for any others.]*
What were you looking for in the new water heater? Were there any particular things you were paying attention to during the purchase process or that were important to you?

Group exercise – handout 1: Current water heater attributes and drivers
- ⇒ Ask participants to complete handout 1 in which they identify the attributes of their current water heater (to the extent they know) and identify whether each was a conscious decision, a recommendation from someone, or just a default choice when they bought their current water heater.
- ⇒ Collect and summarize. Probe, as needed, about the fuel selection.

Group exercise – poster board 1: When / how Xcel Energy rebate entered the equation
- ⇒ Ask participants to place a sticky dot on posterboard 1 to show when the Xcel Energy rebate for water heaters became an active part of their decision-making process.
- ⇒ Briefly review the board. No discussion.

Role of Xcel Energy rebate *[Call on participants based on where they placed stickers.]*
What roles did the Xcel Energy rebate play in your decision making, if any?

Group B version

Triggers for buying and type of water heater *[Go around the room in reverse.]*
Now let's go around the room again. This time, I'd like you to please share:
- What prompted you to buy your current water heater when you bought it?
- What kind of water heater did you buy?

Customer Satisfaction

Group	Approximate Time	Cumulative Time	Notes
A	30 mins	70 mins	
B	0 mins	20 mins	Not including this section.

Now, let's talk a bit more about Xcel Energy and what it was like to participate in the Xcel Energy water heating rebate program.

Group exercise – index card 1: Satisfaction with Xcel Energy overall and Water Heater Rebate program.

⇒ *Ask participants to record letter grades for Xcel Energy and their experience with the water heater rebate program on the index card.*

⇒ *Tell them the back side of the card is available for any notes they want to take as we talk or suggestions or comments they want to make to the program staff that we don't get to.*

Experience of those aware of rebate early on *[Call on a few volunteers to get range of experiences]*

1) For those of you who said the rebate was on your mind early on, let's hear a few of your experiences.
2) As needed, probe about:
   - Where did you hear about the rebate?
   - Was it clear what water heaters were rebated during the shopping process?
   - Was it clear what you'd need to do to claim one and how the process works?
   - Did the process and paperwork seem reasonable?
   - Did you have any interactions with Xcel Energy staff at all as part of the rebate process?
   - How well or not did any contractors you talked with represent and explain the rebate program?
   - What could be improved?

Experience of those whose experience with rebate is limited to claiming it *[Call on a few volunteers to get range of experiences]*

1) Now for those of you who said your involvement with the program was really just a matter of claiming the rebate, let's hear about your experiences.
2) As needed, probe about:
   - Where did you hear about the rebate?
   - Was it clear whether or not the water heater you had selected qualified?
   - Was it clear what you'd need to do to claim one and how the process works?
   - Did the process and paperwork seem reasonable?
   - Did you have any interactions with Xcel Energy staff at all as part of the rebate process?
   - What could be improved?

Suggestions for improving customer experience

⇒ *Summarize what people are commenting on or suggesting.*

1) Does this group have any (other) suggestions for Xcel Energy on how to improve the experience for customers who use the water heater rebate?

Water Heater Use

Group	Approximate Time	Cumulative Time	Notes
A	25 mins	95 mins	
B	25 mins	45 mins	

Now, let's shift gears and talk about how you use your water heater, or more specifically, the hot water it produces.

Group exercise – worksheet 2 / white board 1: Prior day's hot water use.

⇒ *Ask participants to complete handout 2 to itemize what hot water-using activities in their household they remember or think happened the prior day (or a recent day that is representative of a typical weekday.*

⇒ *Ask participants to volunteer what in-home activities tend to use hot water at different times of the day by time block.*

Seasonal variation *[Call on a few volunteers to get range of experiences; confirm with whole group.]*
How much does this vary across seasons, say summer and school year or in any other seasonal way?

Daily variation *[Call on a few volunteers to get range of experiences]*
How much does this vary from day to day during the week?

Weekend variation *[Call on a few volunteers to get range of experiences]*
How are weekends different?

Exhausting hot water tank *[Go around the room calling on everyone.]*
When (how long ago) is the last time you ran out of hot water and couldn't do what you wanted to do because your water heater needed to reheat water first? (Please ignore any times that your water heater wasn't working properly; I just mean times when your water heater could not keep up.)

Active management of hot water supply *[By show of hands]*

1) Do any of you do anything—either regularly or occasionally—for which you count on getting particularly hot water from your water heater?
2) Probe:
   - For what?
   - Do you turn up the water heater thermostat or keep it on a high setting for this purpose?

Unusual uses of hot water (actual or perceived) *[By show of hands]*

1) Does anyone here do anything at home that requires large amounts of hot water that we haven't talked about?
2) Probe: Tell me more...

Pereived spending on water heating *[By show of hands and record.]*
Now please give some thought to how much you pay for the energy that your water heater consumes each month. In other words, how much do you pay for water heating. Please think of your best dollar estimate. Raise your hand if you think it is...

- Less than five dollars a month

- 5-10 dollars a month
- 11 to 20 dollars a month
- 21 to 40 dollars a month
- More than 40 dollars a month

Thermal Storage Opportunities and Barriers

Group	Approximate Time	Cumulative Time	Notes
A	0 mins	95 mins	Not including this section.
B	50 mins	95 mins	

[Note for reviewers: This section of the moderator's guide is wordier than the earlier sections to give you a sense of how the questions for the group may flow and be presented. Suggested edits are most welcome to make sure our questions align with your plans and information needs.]

Finally we want to talk about some topics that will help Xcel Energy update its water heating program for future technology and energy system needs. Specifically, one program idea would provide incentives to customers with electric water heaters to do their water heating during off hours and relying on the tank to keep hot water stored during peak hours. That would help Xcel Energy make better use of inexpensive renewable energy generated at night and rely less on fossil fuels during the day. The utility wants to understand how a program that gets water heaters to recharge mostly at night would or wouldn't work for customers. We have a few questions that are all related to this particular program concept in different ways.

Sufficiency of a single tank of hot water during day *[Go around the room calling on everyone.]*
Now that you've thought a bit about how you use hot water, I'd like you to think about whether you would be able to go through daytime hours, say after 9 am, with a fully heated tank of water without any additional reheating during the day. Do you think you could do that consistently with your current water heater, a slightly larger water heater, not at all, or do you have no idea at all?
Probe:

- (if need a larger water heater) How flexible could you be to shift some daytime usage to night time?
- (if not at all) Tell me more about what makes this infeasible for you.
- (if no idea) What would you need to know to be able to

Willingness to let utility control the water heater with a switch *[Go around the room in reverse order.]*
Now, let's assume for a moment that you would be willing to participate in a future time-based Xcel Energy water heating program. For such a program, the utility may need to install a switch on your water heater. There are several possibilities here, and we want to hear which ones customers like you would be comfortable with. Please raise your hand if you would be perfectly fine with:

1) a timer on your water heater that simply stops the water heating process at a fixed time in the morning, again say at 9 am, and resumes it at a fixed time in the evening, say at 5 pm *[Record which participants did not raise their hands]*
2) a switch that Xcel Energy can communicate with in order to have the water heater reheat, if needed, and then stay off at varying times based on electric system needs.

Follow-up:
Let's hear from those who had a concern about the simple timer. What makes you uncomfortable with it? *[Call on relevant participants; cover all, if feasible]*

What about those who had a concern about the communicating switch. What makes you uncomfortable with it? *[Call on relevant participants; cover all, if feasible]*
Probe:

- What if Xcel Energy only turns off the water heater during daytime hours?
- What if you could manually override it if needed?

Motivation to participate
So let's talk about what might prompt you to choose to participate in a program that limits daytime water heating.

Group exercise – index card 2: Motivation to participate in time-based water heating program

⇒ *Ask participants to complete front side of index card 2 to indicate how motivating it would be to participate if doing so would help Xcel Energy make better use of renewable energy and produce less electricity from fossil fuels because they don't need to provide as much electricity for water heating during the day. Tell them this answer will not be shared with the group.*

⇒ *Ask participants to complete back side of index card 2 to indicate what level of financial incentive they would find reasonable and motivating to get them to participate in a time-based water heater program. Explain that there are three different types of incentives listed, and they can pick whichever one is most appealing (a one time sign-up bonus, a monthly $ bill credit, or a monthly % bill credit).*

Customer advisory council brainstorming exercise

⇒ Participants will pretend they are part of an advisory council to the president of Xcel Energy. Their task is to provide ideas for a program that times the operation of electric water heaters so they heat water in off-hours.

- How would they structure the program?
- What would they offer customers to paraticipate?
- How would they reach out to customers and whom would they target?

Follow-up questions from Xcel Energy observers, if any (funneled to moderator from the observation room)

Exit Process

[Thank and provide instructions for obtaining incentive check]

Handout 1: Water heater attributes and decision-making

Water heater attributes	What is it? (If you don't know, write dk.)	How did you decide?
Water heater fuel (electric / natural gas)		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available
Brand		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available
Tank size		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available
Recharge rate (time it takes to heat up the water again)		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available
Warranty length		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available
Other critical consideration:		☐ We knew what we wanted ☐ We took someone's recommendation ☐ We just went with what we had ☐ We just went with what was available

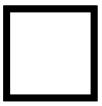
Poster board 1: When / how did Xcel Energy rebate enter the picture?

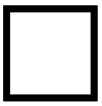
Please pick the purchase process that best represents how you went about buying your water heater. Then place your sticky dot on that timeline to show when the Xcel Energy rebate first became a factor in your process, either because it influenced some aspect of your decisions or because you applied for it.

Decided on getting a new water heater	Shopped around for contractors	Picked a contractor	Picked a water heater	Had the water heater intalled
Decided on getting a new water heater	Shopped around for water heaters	Picked a water heater	Picked an installer	Had the water heater intalled (or did it yourself)

Index card 1: Satisfaction with Xcel Energy and water heater rebate program

Please indicate whatever letter grade (A-F) you would give:

Xcel Energy overall 

Your experience with Xcel Energy's water heater rebate program 

Handout 2: Prior day's hot water use

How many people live in your household...?

Year round: _____

Part of the year _____

Time block	**How did your household use hot water yesterday?** *Please quantify, where possible, as in 2 showers, 3 loads of laundry, etc.*
Before 5 am	
5 am to 9 am	
9 am to 5 pm	
5 pm to 7 pm	
7 pm to midnight	

White board 1: Prior day's hot water use

Time block	Common hot water uses
Before 5 am	
5 am to 9 am	
9 am to 5 pm	
5 pm to 7 pm	
7 pm to midnight	

Index card 2: Motivation to participate in time-based water heating program

Front

Please indicate how motivated you would be to participate in a time-based water heating program, knowing that it would help Xcel Energy make better use of renewable energy at night, including to heat your water, and use less fossil fuel during the day. Circle the most applicable answer.

1 – not at all

2 – a little

3 – somewhat

4 – very

5 – extremely

I have no clue

Back

What level of incentive would seem reasonable and attractive to offer customers to participate in a time-based water heating program? Pick whichever type of incentive you prefer and indicate what you consider to be an appropriate amount. (Assume the costs of the technology and installation are free to the customer.)

One time sign-up bonus $_____

Monthly bill credit (fixed) $_____

Monthly bill credit (relative) _____% of total bill amount

APPENDIX E - PARTICIPANT INTERVIEW GUIDE

Introduction

This guide will be used in interviews of customers who participated in Xcel Energy's Water Heater Rebate product in Minnesota. The interviews will be semi-structured, with these questions serving as a guide for experienced Evergreen Economics staff during one-on-one telephone interviews. Open-ended questions may be asked as appropriate in the flow of the interview with probing as dictated by responses. Closed-ended questions will be asked as shown as much as possible.

Sampling

We will conduct telephone interviews of 50 customers who filed rebates in 2017 or early 2018. Forty of these interviews will be standard participants whose initial rebate applications were processed successfully and resulted in a rebate; these customers will be chosen randomly from among customers located in the greater Twin Cities area.[2] These customers will be drawn from Xcel Energy's program participation records. We will exclude customers who are listed as "do not call" or "do not contact," and we will not reach out to customers by e-mail who are listed as "e-mail opt out."

Ten of the interviews will be set aside for customers whose initial rebate application was rejected; these customers will be sampled from the applications we review in an earlier task.

Table 1. Participating Customer Interviews

Strata	Sampled Geography	Target Completions
Successful Participants	Metropolitan Twin Cities	40
DNQ customers	Statewide	10
Total		50

Recruitment

Evergreen interviewers will reach out to sampled customers by e-mail or telephone to request their participation. Interviewers will identify themselves as calling on behalf of Xcel Energy, but be clear that we are a third party research firm. We will schedule interviews with willing and responsive customers; where feasible, we may even conduct the interview on the spot if we reach a willing participant by telephone. To minimize non-respondent bias, we will reach out to sampled customers at least four times and leave a message at least once before abandoning a sample point.

[2] We are singling out Twin Cities area participants to allow the interviews to serve as a recruitment tool for the focus groups as well. We assume that customer satisfaction for Twin Cities area customers will not differ in meaningful ways from that of the full set of statewide customers.

Participant Interview Research Questions and Objectives

- What is customer satisfaction with the program and program elements?
- What is the cause of high does-not-qualify rates among customer applications? What would be required to reduce the rate and how does that improve customer satisfaction?
- How important are water heater rebates to customers?
- Which participants would be potential candidates for an electric thermal storage program and willing to participate in focus groups?

Interview Questions

Introduction (talking points for recruitment and interview start)

Talking points for recruitment:

- Evergreen Economics is working with Xcel Energy on an evaluation of its energy efficiency programs.
- We are calling you because you recently applied for an Xcel Energy rebate for your new water heater.
- We would like to speak with you or a member of your household who can best talk about the water heater replacement and your experience with the Xcel Energy program.
- We would need about 15-20 minutes for the interview, and your input will help Xcel Energy best serve you and customers like you.
- When would be a good time to talk?

Talking points for starting the interview (if scheduled):

- Identify self (name, calling from Evergreen Economics on behalf of Xcel Energy)
- Thank you for taking the time to talk about your water heater replacement and your experience with Xcel Energy water heater rebate program.
- This should take about 15-20 minutes.
- Your responses will be anonymous, so please feel free to speak candidly.
- What we hear from you and other program participants will be helpful to Xcel Energy to ensure their programs best serve their customers.
- Do you have any questions before we begin?
- Would you feel comfortable if I record this call for note taking purposes? We will not share the recording with anyone outside our company and will not attribute anything you say back to you.

Customer Journey

A1. What prompted you to replace your water heater in 2017 or early this year?

If failure of prior water heater, probe to understand:

- Was the prior water heater failing or had it completely stopped working when you started shopping for a new water heater?

A2. Did you have an electric or natural gas water heater previously?

If natural gas, probe to understand:

- How does your new water heater compare to the old one in size?
- How does it compare in its efficiency level, or do you know?

A3. Where did you go or whom did you consult to figure out your replacement options?

If plumber or professional installer, probe:

- How many installers did you contact?

A4. Why did you choose the water heater you ultimately chose?

Record unaided responses and probe (if not mentioned)

- Did you talk with a salesperson about any of the following?
  - The new water heater's size
  - The new water heater's recovery rate (or how quickly it heats up water)
  - The new water heater's energy factor (or efficiency level)

A5. You installed a natural gas water heater to replace the previous one. Was that a conscious decisions or something you didn't think much about?

Probe:

- (if conscious decision) Why is that?
- (all) Would you have considered an electric water heater if presented with an attractive option?

Customer Satisfaction

B1. You ultimately applied for an Xcel Energy rebate for the water heater you purchased. Which of the following statements best reflects your awareness of the Xcel Energy water heater rebates when you first started looking for replacement water heaters?

a) We weren't aware or thinking about Xcel Energy rebates for water heaters.
b) We had a vague sense that Xcel Energy has rebates for some energy-using equipment.
c) We knew or suspected that Xcel Energy had rebates for some water heaters.
d) We knew Xcel Energy had rebates for some water heaters and wanted to make sure we got one that qualified.

B2. When and from where did you find out about the Xcel Energy rebate you applied for?

B3. What role, if any, did the rebate play in your selection of water heaters?

B4. [for customers who received a rebate – both from participant sample and DNQ sample] Have you received your rebate?

If no, probe to understand:

- Have you had any communications or follow-up from Xcel Energy about your rebate?
- (if yes) What did they tell you?
- (if yes) How do you feel about the way Xcel Energy handled those communications about the rebate?

B5. [for DNQ customers who did not get a rebate at all] I understand you ended up not getting a rebate. Is that correct?

If yes, probe:

- Please tell me what happened?
- How do you feel about the way Xcel Energy handled the situation?
- What could or should they have done differently?

B6. Next, I would like to find out how satisfied you were with different aspects of Xcel Energy's water heater rebate program. For each one, please tell me whether you were very dissatisfied, somewhat dissatisfied, somewhat satisfied, or very satisfied.

a) the information you were given about which water heaters qualify
b) ease of the application process
c) your interaction with Xcel Energy or its trade allies about the rebate
d) [skip if no rebate received] the time it took to receive your rebate

B7. Do you have any suggestions for how the rebate program could be improved?

Awareness and Attitudes about Electrification [for customers who received a rebate only]

Finally, I have some questions about some broader issues concerning our energy system.

C1. How much do you care whether your appliances use electricity or natural gas assuming there is not difference in cost? Would you say you don't care at all, care a little bit, or care a lot?

If care a lot, probe:

- What energy fuels do you prefer your home appliances to use?
- Why?

C2. How much do you care where the electricity you use comes from? Do you not care at all, care a little, or care a lot?

If care a lot, probe:

- Where would you prefer your electricity to come from?

C3 Some households save money on their energy bills and also help utilities manage energy supply and demand by shifting when they use electricity – usually from weekday daytime hours to nighttime or weekends. Which of the following statements best describes your household's ability and willingness to shift your energy usage?

a) #1) That's not something for us. We want to keep full control and flexibility over when we use energy.
b) #2) We don't really want to give up control and flexibility, but we don't use much energy during the day. Depending on the details, this might be something for us.
c) #3) We would be willing to be flexible if we don't need to think about it too much or technology can handle it for us. Depending on the details, this could be interesting.
d) #4) We don't mind interacting with our energy using appliances and being flexible. This might be interesting.

[Note to interviewer: Exclude response A from consideration for focus group recruitment.]

C4. Xcel Energy has a history of providing rebates for efficient natural gas water heaters, but the company is considering whether and when to shift the rebates to newer technologies. Which of the following four statements best reflects your opinion:

a) I think Xcel Energy's rebates should promote the newest and best efficient technology even if that means giving up existing rebates.
b) It'd be a shame if the existing rebates for energy efficient hot water heaters weren't offered anymore.
c) I can't decide.
d) I don't have an opinion one way or the other.

C5. And just one more question about your water heating. Since you installed your new water heater, have you ever run out of hot water when you wanted or needed some?

If yes, probe to understand:

- How regularly does that happen?

[Note to interviewer: Eliminate from consideration for focus groups if the respondent has run out of hot water more than once or expressed annoyance at running out of hot water a single time.]

Focus Group Recruitment [for customers who received a rebate and not excluded from consideration by C3 or C5]

D1. Xcel Energy will be conducting focus groups of a small number of customers to get more feedback and also some input on some potential future program offerings. You fit the qualifying criteria for these focus groups, and we would love to have you participate. The focus groups will be held on August [xx]. They will take less than two hours, and we will pay you $100 as a thank you for your time and input. Would you be interested in participating if your calendar is free then?

- Yes ➔ [Go through scheduling protocol]
- No

- (Need someone to call me with more information) ➔ [Refer to focus group moderator for recruitment.]

Closing

Thank and terminate. If respondent volunteered for focus groups, refer to upcoming scheduling outreach.