



An Energy Action Plan for Superior

Final Plan, January 2021



PARTNERS IN ENERGY
An Xcel Energy Community Collaboration

ACKNOWLEDGEMENTS

The content of this plan was co-authored by Partners in Energy and the Town of Superior's Advisory Committee for Environmental Sustainability (ACES) and developed with community feedback. For more information about the planning process, see Appendix A.

Thank you to the following individuals who contributed many hours of service to developing this Energy Action Plan.

Energy Action Team

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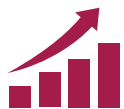
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Town of Superior Energy Action Plan

By the end of 2022, the goal of the Energy Action Plan (Plan) is to better connect Superior residents and businesses with information and financial resources they can use to take meaningful action to reduce energy use. This Plan is a collective call to action to address the challenges and opportunities for a better tomorrow. It was developed and co-authored with Superior's Advisory Committee for Environmental Sustainability (ACES) through Xcel Energy's Partners in Energy program which supports communities like Superior in developing and achieving their energy goals. Additionally, this Plan supports the State of Colorado's Climate Plan of reducing statewide greenhouse gas emissions by more than 26% from 2005 levels by 2025 and 50% by 2050

Energy Action Context



Energy use increased **7%** over the last three years



Community spends **\$8.9** million annually on energy



Commercial customers consumed **41%** of total energy



90% of customers are residential



95% of surveyed residents think saving energy in their home is important

Strategic Priorities

To achieve our energy vision, the Energy Action Plan identifies four key strategies:

- Engage businesses in energy efficiency and renewable energy programs
- Engage residents in energy efficiency and renewable energy programs, and support community solar
- Promote energy efficient new development
- Identify municipal energy efficiency and renewable energy projects and explore fleet expansion of electric vehicles

By Reaching This Plan's Goals, by 2022 We Will:



Reduce money spent on energy by **\$260,000**



Reduce greenhouse gas emissions by **1,400 mtCO₂e**, which is equivalent to removing over **300** cars from the road

INTRODUCTION



Why an Energy Action Plan?

The goal of the Energy Action Plan (Plan) is to better connect Superior residents and businesses with information and financial resources they can use to take meaningful action to reduce energy use.

The Plan also supports Superior's efforts to achieve progress on the energy portion of its community-wide sustainability goals. Additionally, this Plan supports the State of Colorado's Climate Plan of reducing statewide greenhouse gas emissions by more than 26% from 2005 levels by 2025 and 50% by 2050.

Over the past decade, the Town has taken significant steps toward becoming a "greener" community. With the help of the Advisory Committee for Environmental Sustainability (ACES), the Town is working toward adopting the following 2025 Sustainability Goals:

1. **Climate:** Reduce greenhouse gas emissions at least 25% compared to a 2005 baseline.
2. **Waste:** Increase the community-wide waste diversion rate to 30%
3. **Energy:** Reduce combined electricity and natural gas use from Xcel Energy by 10% per capita
4. **Water:** Reduce per-capita domestic water consumption by 10%
5. **Air Quality:** Reduce ozone pollution below the EPA National Ambient Air Quality Standard (NAAQS) level

In Fall 2019, the Town joined Xcel Energy's Partners in Energy Program which uses a data-driven process for selecting, implementing, and tracking high-impact strategies to

achieve energy goals. This Energy Action Plan describes Superior's community-wide energy use, establishes a baseline year, sets measurable goals, and identifies strategies to help achieve those goals.

Our efforts will be implemented over a 12-month period, through the beginning of 2022. Xcel Energy's Partners in Energy will provide marketing and communications support, data tracking and measurement, program expertise, and project management. Partners in Energy will also provide the community and partners access to webinars, best practices from other community energy action plans, and other resources to support our implementation. See Appendix A for more information about Partners in Energy and the planning process.

HOW DOES SUPERIOR USE ENERGY?



An integral part of the Partners in Energy planning process is reviewing historic energy data for Superior. Xcel Energy provided data on energy use, participation counts, and savings for utility energy conservation programs. Three years of data were analyzed (2016-2018) during the planning process and a baseline year of 2018 was selected to track the impact of efforts completed throughout the implementation period and beyond. See Appendix B for a complete picture of Superior’s baseline energy data.

Energy Use

The vast majority of energy customers in Superior are residential. While there are fewer commercial customers than residential customers, on average, commercial customers use considerably more energy than residential households and spend more per year on energy as a result. So, while the residential sector presents many opportunities for widespread engagement in the community, taking action at fewer sites in the commercial sector can result in greater total energy savings. Furthermore, while residential energy use remained relatively constant between 2016-2018, commercial energy use increased 8.5% over the same time period. See Figure 1 below for a summary of Superior’s energy use.

Term Check

Energy data is collected for each premise in a community. A “premise” is a specific location receiving energy service. Though one premise doesn’t always equal one building or one customer, total premises can be a rough proxy for number of buildings or customers.

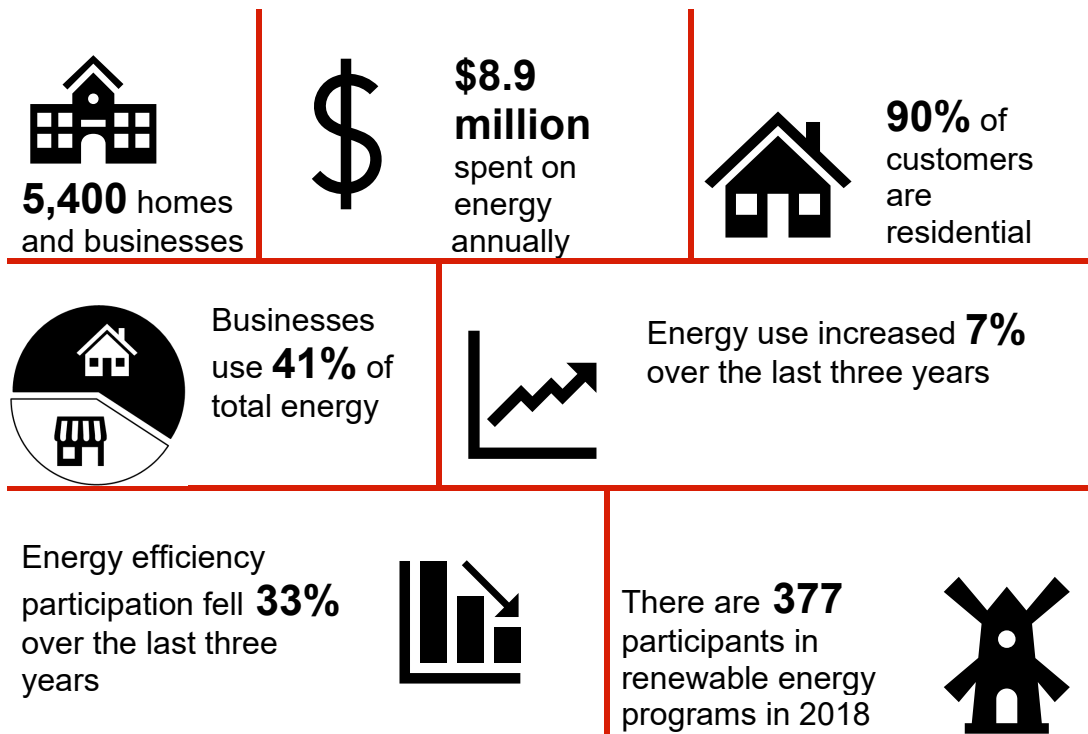


Figure 1. Superior's Energy Profile by the Numbers

How Do We Compare?

Table 1 summarizes total energy used per premise in 2018 for Superior and two of its neighbors. Energy use per premise can be a good way to account for community size when comparing energy use. Differences in energy use can be attributed to a number of factors such as household median income and average home size.

Community	2018 Energy Use per Premise (MMBtu)
Superior	128
Lafayette	122
Louisville	180

Table 1. Comparison of Energy Use per Premise

Participation in Energy Efficiency Programs Fell, but Savings Increased

Since 2018, participation in energy efficiency programs (also called Demand Side Management, or DSM) declined 33% - from 397 to 267 participants annually. In 2016, Xcel Energy led a marketing campaign to encourage residents to purchase smart thermostats and enroll in a corresponding program to improve cooling efficiency.

Though overall participation has decreased since that marketing effort, total savings from participation in DSM programs has increased over the same time period - suggesting that community members are participating in more high-impact programs. Still, the downward trend in overall participation presents an opportunity to reengage both residential and commercial community members to improve energy efficiency.

Participation in Renewable Energy Programs Grew

From 2016 to 2018, participation in renewable energy programs by residents and businesses grew from 299 to 377 participants.



Demand Side Management (DSM) programs are offered to residents and businesses to help consumers lower their energy usage, peak demand, and energy bills. DSM programs can help utilities spread out demand to keep operational costs low. Examples of DSM programs include energy audits and efficient equipment upgrades.

WHERE DO WE WANT TO GO?



Vision Statement

During the planning process, the Energy Action Team adopted the ACES vision as the guide for this plan. This statement reflects the intention of ACES to integrate the strategies detailed in this plan with their ongoing sustainability efforts.

ACES aims to support environmental sustainability, to include management of waste, water and energy, and other activities that support resource conservation, improved air and water quality, and climate change mitigation.

Goal

Concurrent to the development of this Energy Action Plan, ACES began developing a Town-wide sustainability plan which it hopes will establish the following 2025 energy-related goals:

- Reduce greenhouse gas emissions at least 25% compared to a 2005 baseline
- Reduce combined electricity and natural gas use from Xcel 10% per capita
- Reduce ozone pollution below the EPA National Ambient Air Quality Standard (NAAQS) level

The strategies outlined in this Energy Action Plan help address the Town's Sustainability efforts by reducing greenhouse gas emissions and improving energy efficiency in buildings.

HOW WILL WE GET THERE?



Strategies help answer the question “how will we achieve our goals and vision”. The four strategies below are presented in order of greatest impact on achieving the goals:

1. Engage businesses in energy efficiency and renewable energy programs
2. Engage residents in energy efficiency and renewable energy programs, and support community solar
3. Promote energy efficient new development
4. Identify municipal energy efficiency and renewable energy projects and explore fleet expansion of electric vehicles

Strategy 1: Engage Businesses in Energy Efficiency and Renewable Energy Programs

Though businesses comprise only 9 percent of the premises in Superior, they consume 41 percent of the electricity and 16 percent of the natural gas in the community.

Targeting Superior’s businesses can offer a significant return on investment. Small and medium businesses often present the greatest number of opportunities, as many of these businesses haven’t yet maximized their energy efficiency potential. Still, identifying opportunities for energy action in Superior’s largest businesses can yield the greatest savings.

Strategy Overview

This strategy aims to involve more Superior businesses in some of Xcel Energy’s highest-impact programs and offerings to garner larger energy savings. Superior has approximately 100 businesses spread across seven different commercial areas. Many of these businesses are medium to large retail spaces and are part of regional and national chains. These businesses often have a dedicated facility manager, and in some cases an account manager assigned from Xcel Energy, dedicated to identifying and implementing energy improvements for the space. Working closely with facility and account managers offers a viable pathway toward helping larger businesses take energy action. Though large businesses can present the biggest “bang for buck” opportunities, many large businesses have already taken energy action with the highest return on investment. Alternatively, smaller local businesses may not have taken the time to identify and implement energy-saving opportunities. Thus, this strategy includes actions targeted toward engaging both small, local businesses and larger retailers.

Targets

During the implementation period, engage an additional 40 businesses in energy efficiency programs, including at least 1 large business and an additional 5 businesses in renewable energy programs

Specifically, we will place a focus on increasing participation in the following high-impact energy efficiency programs:

- Lighting Efficiency
- Motors and Drives
- Cooling

Scope and Priorities

1. Identify opportunities for energy action for large businesses
 - a. Identify large businesses in Superior
 - b. With account managers, hold a lunch-and-learn for large businesses in Superior to educate and raise awareness of opportunities for energy action, and provide an opportunity for large businesses to share their efforts
 - c. Spotlight a business and share its energy action success with other large businesses

2. Host Coffee with an Engineer
 - a. Identify and target small and medium businesses
 - b. Share energy efficiency video for small business
 - i. Develop Superior-specific content
 - ii. Upload content to public portal page and share with business community
 - iii. Include a link for businesses to register for Coffee with an Engineer
 - c. Develop informational content based on business types of registrants
3. Conduct an outreach campaign promoting energy efficiency and renewable energy programs and tips
 - a. Develop social media calendar for community to promote energy efficiency and renewable energy programs and tips
 - b. Spotlight a Superior business that has taken an energy action

Communication Pathways/Resources Available

- Chamber of Commerce
- Town of Superior Economic Development
 - Better City, LLC
- Social Media: Facebook, Instagram
- Targeted emails
- Cold calls
- Boulder County Partners for a Clean Environment (PACE)
- Xcel Energy large account representatives

Potential Messaging Tactics

- Saving energy saves money
- Support economic recovery and development
- Improve comfort and performance
- Recognition opportunities

Funding/Resource Needs

- None

Responsibilities

ACES

- Identify and connect with businesses
- Collaborate with Boulder County Partners for Clean Energy (PACE)
- Develop Superior-specific content for energy efficiency video

Partners in Energy

- Host Coffee with an Engineer event(s)
- Develop outreach content for businesses
- Coordinate small business focused outreach with Xcel Energy vendors

Strategy 2. Engage Residents in Energy Efficiency and Renewable Energy Programs, and Support Community Solar

Superior's residential premises consume 60 percent of the Town's total electricity and 85 percent of its total natural gas. Targeting the residential energy sector by promoting energy efficiency and renewable energy presents a significant opportunity to reduce the Town's overall energy usage. However, bringing about sustainable energy actions, which include behavior change, do-it-yourself (DIY) efficiency improvements, and even energy efficiency and renewable program participation, can be challenging. ACES completed a residential study to better understand barriers and opportunities.

Strategy Overview

This strategy aims to reduce energy use by influencing the implementation and adoption of energy efficient infrastructure and behaviors in existing single-family homes. A pilot study, led by Skumatz Economic Research Associates (SERA) in partnership with Xcel Energy, tested various informational materials and outreach approaches to determine those most effective for modifying energy efficiency behavior. The study found that residents care most about making their homes more efficient and saving energy. As part of a follow-up survey, several households pledged to take various energy actions. This strategy focuses on building on the residential behavior change study outreach by promoting energy saving tips and Xcel Energy programs best suited for Superior's residents. For a summary of study methodology and results, see Appendix C.

Targets

In support of achieving a 10% reduction of per-capita energy by 2025, this strategy seeks to engage an additional 250 households in energy efficiency programs, over 2018 baseline levels, during the implementation period - with the largest focus on the following programs:

- Home Energy Squad® and Home Energy Squad Plus
- High Efficiency Air Conditioning
- Residential Heating
- Refrigerator Recycling
- Single Family Residence Weatherization
- Insulation & Air Sealing
- Thermostat Upgrade Programs

In addition to exploring the feasibility of a community solar installation in Superior, engage an additional 50 residents in renewable energy programs, over 2018 baseline levels, during the implementation period.

Scope and Priority

1. Customize and share HOA outreach toolkit for residential energy efficiency and renewable energy
 - a. Identify point of contact for Rock Creek, Calmante, Ridge at Superior, Sagamore, and Waterford Estates

- b. Host meeting with HOA points of contact to share existing resources and identify local need
 - c. Customize toolkit for Superior HOAs, including information about programs identified under targets section
2. Conduct Home Energy Squad® challenge among HOAs and other neighborhoods
 - a. Develop electronic outreach material promoting Home Energy Squad challenge (flyer and social media calendar)
 - b. Include messaging based on identifying ways to save money and make homes more efficient
 - c. Develop unique hashtag and encourage residents to post a picture of their visit, with the unique hashtag, on social media
 - d. Enter participants in a raffle to win a prize
3. Explore the feasibility of a community solar installation in Superior

Communication Pathways/Resources Available

- Social Media:
 - Nextdoor and Facebook for neighborhoods and HOAs
 - Facebook and Instagram for Town of Superior
- Town of Superior Website

Potential Messaging Tactics

- Follow through on your energy and sustainability pledge (for those who pledged through the study)
- Help your community meet its energy goals
- Save money
- Improve the efficiency and comfort of your home

Funding/Resource Needs

- Support for printing costs of marketing materials
- Additional rebates and support through Boulder County [Partners for a Clean Environment](#)

Responsibilities

- ACES
 - Distribute flyers door-to-door
 - Post social media content
- Partners in Energy
 - Develop collateral and outreach for residents

Strategy 3: Promote Energy Efficient New Development

Superior is a slow-growing community, with a historical annual average growth rate of 0.5% over the past 10 years (DOLA, 2020). Still, with the proposal for a mixed-use Downtown Center, the Town has ample opportunity for new development. With new residential and commercial development planned in the near future, ensuring that new development is energy efficient and maximizes opportunities for renewable energy will help the Town meet its long-term goals.

Strategy Overview

This strategy aims to identify opportunities for intervention (e.g., additional enforcement, education, and encouragement) in the approval process for both residential and commercial development and redevelopment. The proposed development of the new Downtown Center provides Superior an opportunity to support construction that will meet or exceed energy efficiency code standards.

Xcel Energy offers rebates to builders through their Commercial New Construction and ENERGY STAR New Homes program. The Energy Efficient Buildings program, a component of Commercial New Construction, is oriented toward small commercial buildings. Energy Design Assistance, for construction or renovation of 50,000 square feet or more, offers comprehensive energy modeling with incentives for the customer and reimbursement for the design team. As part of this strategy, Xcel Energy will work with the Town to identify training opportunities for staff members about the details of the new construction programs and building codes.

Targets

Increase participation in targeted energy efficiency programs, above 2018 baseline levels, including:

Residential:

- 12 additional residential units participate in the ENERGY STAR new homes program
- 39 additional residential units participate in heating & cooling equipment and thermostat programs
- 12 new residential units are designed to be solar ready

Commercial:

- Engage 1 additional small-medium new business to participate in the Energy Efficient Buildings program
- 1 new small-medium business is designed to be solar ready

Scope

1. Identify baseline, need, and opportunity
 - a. Meet with Town staff and ACES to better understand current code structure, including pathways for compliance and areas of opportunity
 - b. Align around desired messaging from Town to development community
 - c. Identify key stakeholders from development community to engage during outreach
 - d. Determine gaps and decide how to improve compliance and participation

2. Host Breakfast with Builders – event(s) to answer questions and connect builders and developers with best practices for new construction in Superior
 - a. Identify key builders and developers in Superior
 - b. Schedule one or more breakfasts to be held virtually
 - c. Identify speakers from Xcel Energy and the Town
 - d. Develop presentation content and one “takeaway” piece of outreach material
 - i. Topics could include electric vehicle-ready construction and resources, code compliance and exceedance, and Xcel Energy new construction best practices and resources
 - e. Host one or more virtual breakfasts
3. Monitor progress
 - a. Survey developers’ knowledge of energy efficiency best practices and Xcel Energy programs before and after engagement
 - b. Evaluate number of new developments that meet or exceed Superior’s codes

Communication Pathways/Resources Available

- Town of Superior Departments
 - Planning Department
 - Building Department
- Chamber of Commerce

Potential Messaging Tactics

- To be decided, in partnership with Town and ACES, during implementation

Funding/Resource Needs

- None

Responsibilities

- ACES
 - Work closely with Town Planning Department
 - Conduct outreach to key stakeholders
- Partners in Energy
 - Help identify appropriate programs and offerings
 - Assist with development of outreach materials
 - Co-host Breakfast for Builders
 - Coordinate access to technical assistance - to development community and Town staff - related to energy efficient code, best practices for new construction, and resources available

Strategy 4: Identify Municipal Energy Efficiency and Renewable Energy Projects and Explore Fleet Expansion of Electric Vehicles

Municipal facilities generally make up between one and four percent of total community energy use. The Town wants to be a leader in reducing greenhouse gas emissions and is committed to investing in energy efficiency and renewable energy in its municipal buildings. It is also committed to exploring expansion of electric vehicles in the municipal fleet. Transportation is the leading contributor to greenhouse gas emissions in the United States (EPA, 2020) and EV adoption directly reduces vehicle emissions.

Strategy Overview

This strategy aims to identify opportunities to reduce energy use and invest in renewables for municipal facilities and develop a plan to electrify light- and medium-duty vehicles in the Town's fleet that are eligible for replacement through participation in Xcel Energy's Fleet Electrification Advisory Program.

Targets

- Conserve 1% of municipal energy by 2022
- Identify opportunities for renewable energy generation
- Increase the number of EVs in the Town's fleet by 2022

Scope

1. Identify the municipal buildings with highest energy use
 - a. Identify savings opportunities by participating in Xcel Energy's Energy Analysis program
 - b. Complete one or more energy improvements identified through the Energy Analysis program
 - c. Identify and encourage behavioral changes that could help reduce energy use, such as shutting off computers at the end of work days
2. Identify a pathway to increase renewable energy
 - a. Evaluate purchase vs. lease options
3. Explore the feasibility of municipal fleet electrification
 - a. Connect Town of Superior with Xcel Energy's Fleet Electrification Advisory Program
 - b. Develop a vehicle replacement plan
 - c. Identify additional funding sources such as Charge Ahead
 - d. If vehicle electrification occurs, share the Town's success with the public through a project spotlight

Communication Pathways

- Town of Superior website

Potential Messaging Tactics

- Leading by example
- Improving air quality and reducing Town's emissions

Funding/Resource Needs

- Funds for energy efficiency improvements
- Funds for vehicle procurement
- Funds for EV infrastructure

Responsibilities

- ACES
 - Work with Town staff to identify municipal buildings and prioritize those with highest opportunities for improvements
 - Work with the fleet manager to identify the number of Town vehicles eligible for replacement by 2022
 - Work with Town to secure funding to install EV charging stations and purchase new vehicles
- Partners in Energy
 - Work with ACES to obtain energy use information for municipal buildings
 - Connect Town staff with information and resources related to the Energy Analysis program
 - Connect ACES with the Fleet Electrification Advisory Program
 - Develop messaging to share successes

Impact of Energy Action Plan

Over the next 12 months, achieving the participation targets in this plan would result in:

- Electricity savings of 2,637,000 kWh
- Natural gas savings of 49,000 therms
- Greenhouse gas reduction of 1,400 mtCO₂e

By 2025, achieving the long-term energy goals set forth in this plan would result in:

- Electricity savings of 13,188,000 kWh
- Natural gas savings of 246,000 therms
- Greenhouse gas reduction of 6,400 mtCO₂e

By achieving the EV targets established in this plan, transportation-related greenhouse gas emissions will likely be reduced, however, we did not model those impacts as part of this effort.

HOW WE STAY ON COURSE



This Energy Action Plan is a living document and goals and strategies will be assessed and refined as needed, based on data and Town staff capacity.

Data and Reporting

Partners in Energy will provide biannual progress reports with metrics of success and overall progress toward goals for Xcel Energy rebates and programs. These reports will be available publicly and shared with both the community and Energy Action Team.

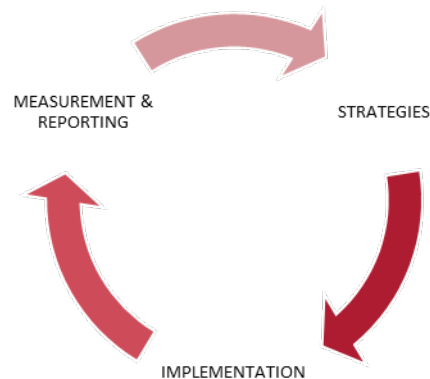


Figure 2. Actions and Tracking

Participation reports for Xcel Energy programs (e.g., Home Energy Squad) are available to measure success of campaigns and determine if a change course is needed.

Project Management and Tracking

Partners in Energy will host regular project management check-in calls with staff to ensure progress on the Plan continues. If necessary, a meeting with the Energy Action Team will be convened to discuss strategy refinement.

Energy Action Team Commitment

This plan was developed and vetted in partnership with ACES, with an eye toward action-oriented strategies. ACES will support the implementation of this plan by forming an Energy Action Team to identify priorities, consult the larger ACES team, and coordinate outreach and engagement with the larger community.

APPENDIX A: XCEL ENERGY'S PARTNERS IN ENERGY PLANNING PROCESS



About Xcel Energy's Partners in Energy

Xcel Energy is an electric and natural gas utility that provides the energy that powers millions of homes and businesses across eight Western and Midwestern states. Each community Xcel Energy serves has its own unique priorities and vision for energy. Energy is a dynamic topic, and it's changing rapidly with new ways to save, the growth of renewables, electric vehicles, and changing regulations. With these competing priorities and stretched resources, creating and maintaining an energy-conscious culture within your community can be a missed opportunity in meeting energy and sustainability goals.

In the summer of 2014, Xcel Energy launched Partners in Energy as a collaborative solution for communities to reach their energy goals. Partners in Energy is a two-year collaboration between Xcel Energy and a community to define energy goals, to develop a plan to achieve those goals, and to implement the energy plan. Xcel Energy provides project management, data analysis, facilitation services, and resources to support planning and implementation. Though communities must commit their time to participate in this process, there is no financial requirement to participate.

Plan Development Process

The content of this plan was developed in close collaboration with the Town of Superior's Advisory Committee for Environmental Sustainability. The Partners in Energy Team coordinated planning efforts with ACES liaison, Lisa Skumatz, who left ACES in October 2020, and was replaced by Mike Foster.

The Plan was circulated for public feedback in December 2020 and nearly two dozen comments were received. Where appropriate, that feedback was incorporated into the Plan.

A single work session was held at the outset of the planning process to quantify Superior’s energy baseline and to establish direction for the plan vision, goals, and strategies. The vision of this plan was aligned with the overarching ACES vision and the goals were aligned with the sustainability goals developed concurrently during the energy action planning process.

Following this work session, planning efforts focused on supporting an ACES-led residential study. The purpose of the study was to understand single-family residential motivations for engaging in various sustainability actions. The results of this study were used to inform the residential strategy in the energy action plan by answering the question: what motivates residents to take energy action. For more information on the residential study, see Appendix C.

The remaining strategies were developed by analyzing Superior’s energy baseline and by reviewing and aligning around areas of opportunity with ACES liaisons. See the figure below for an illustration of a traditional planning process and resources offered to support the planning process.



Partners in Energy Process for Success



Resources from Xcel Energy for Implementation

APPENDIX B: BASELINE ENERGY ANALYSIS



As part of implementation support, Partners in Energy will provide biannual progress reports for Xcel Energy participation and savings data. All goals will be measured against a baseline of 2018 data unless otherwise noted.

Premises

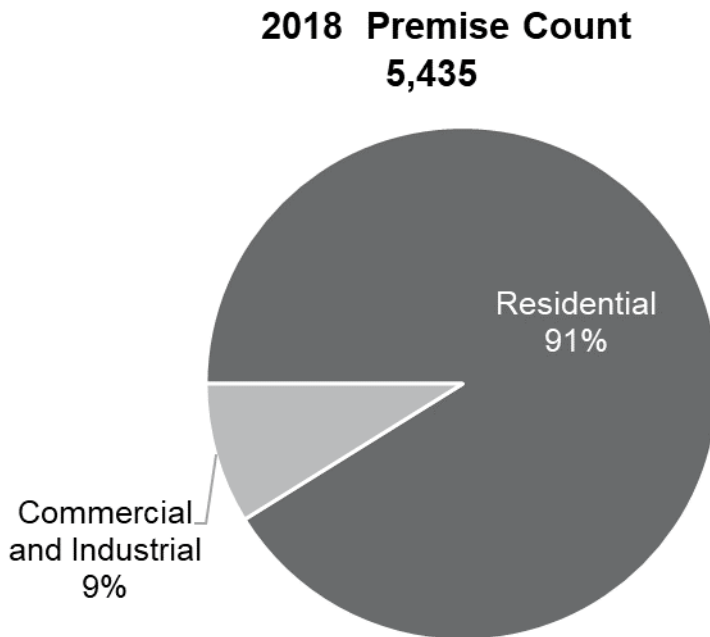


Figure 3. Superior Premise Count 2018

Energy Consumption and Trends

2018 Electricity Consumption (kWh)
69,671,782

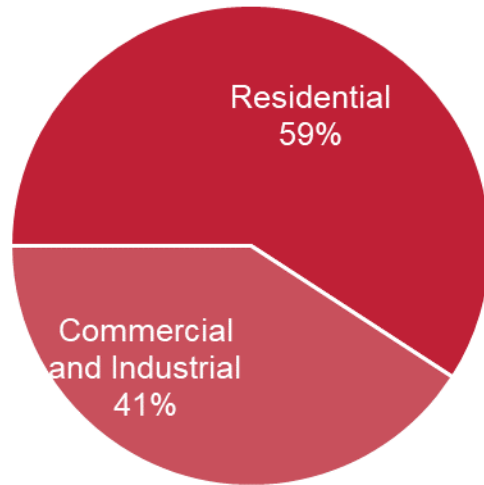


Figure 4. Superior Electricity Consumption by Sector 2018

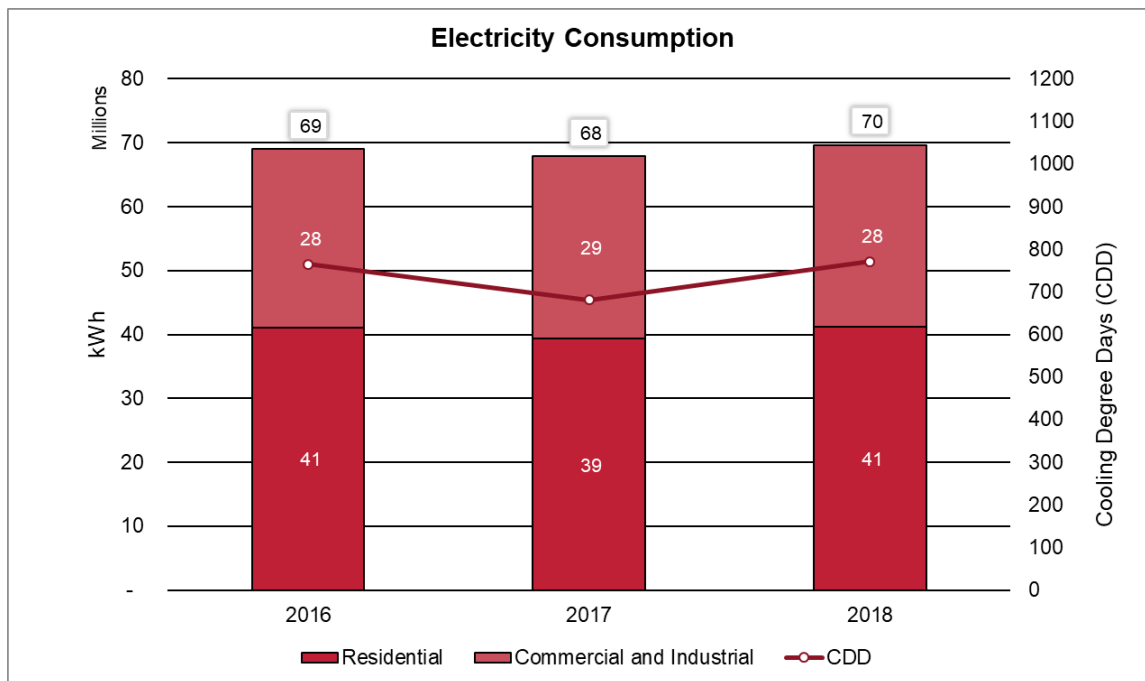


Figure 5. Superior Electricity Consumption 2016-2018

**2018 Natural Gas Consumption (therms)
4,585,291**

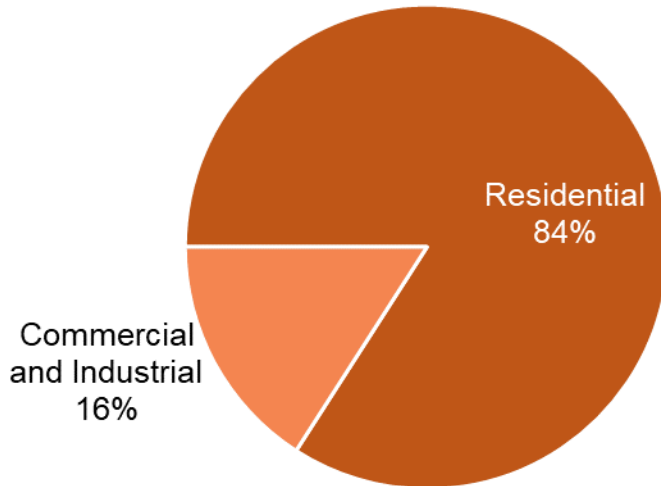


Figure 6. Superior Natural Gas Consumption by Sector 2018

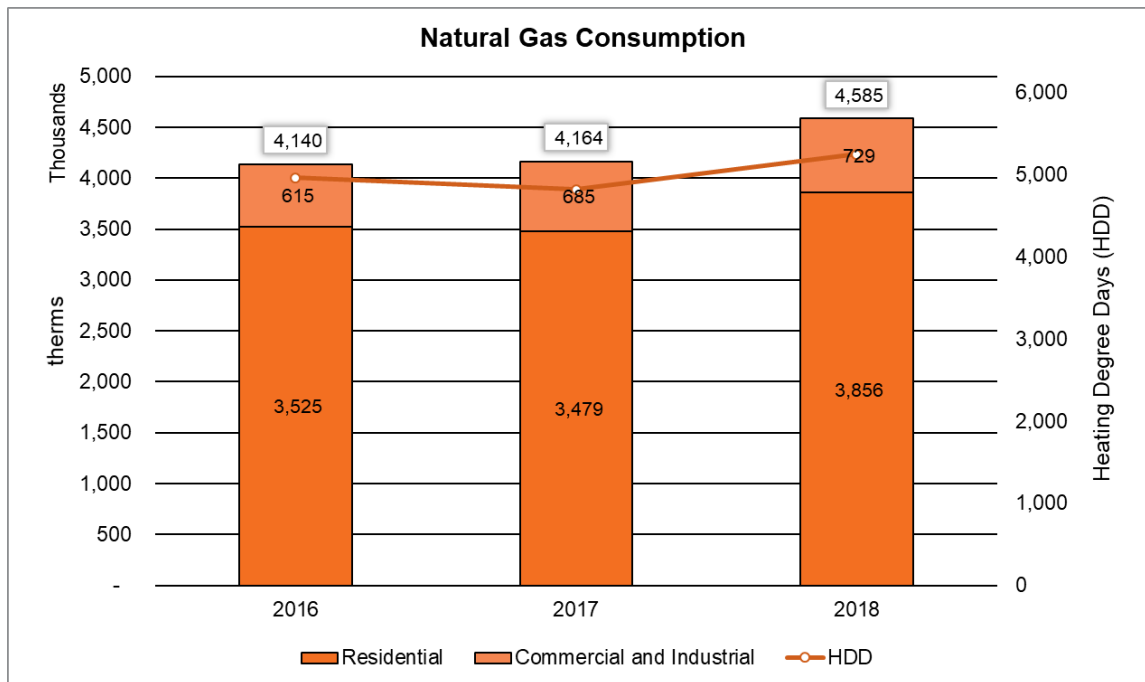


Figure 7. Superior Natural Gas Consumption 2016-2018

Energy Costs

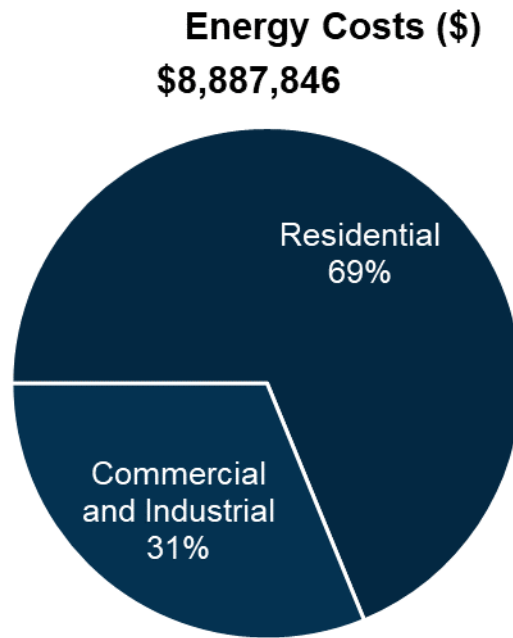


Figure 8. Superior Energy Cost by Sector 2018

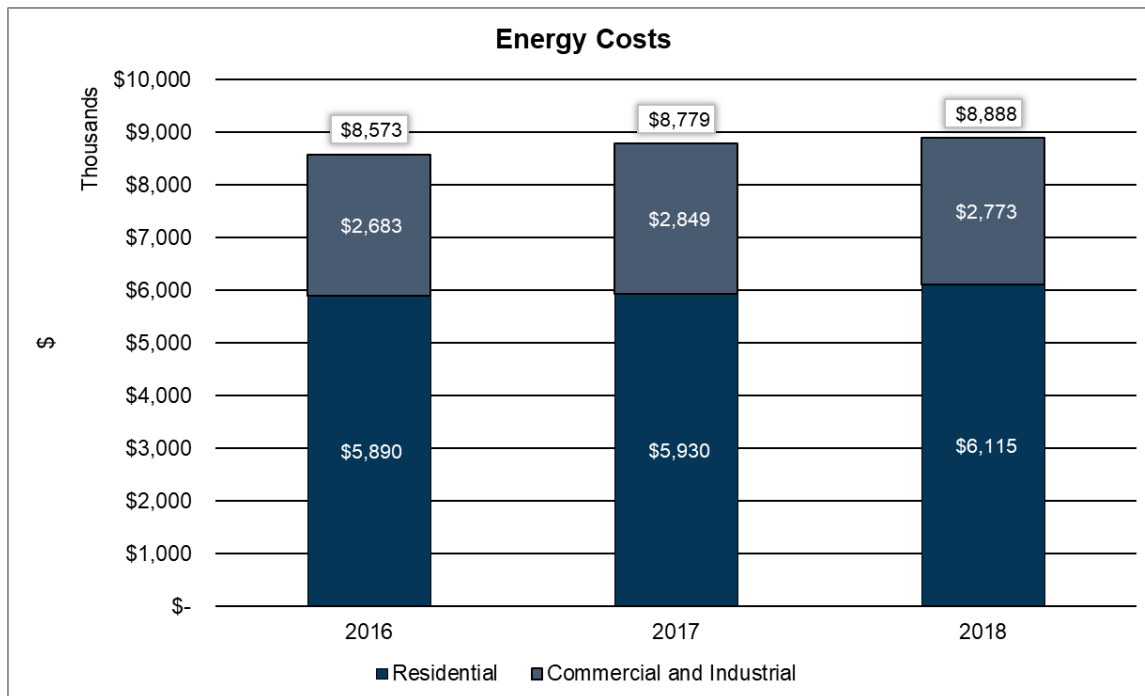


Figure 9. Superior Energy Cost 2016-2018

Energy Efficiency Program Participation and Savings

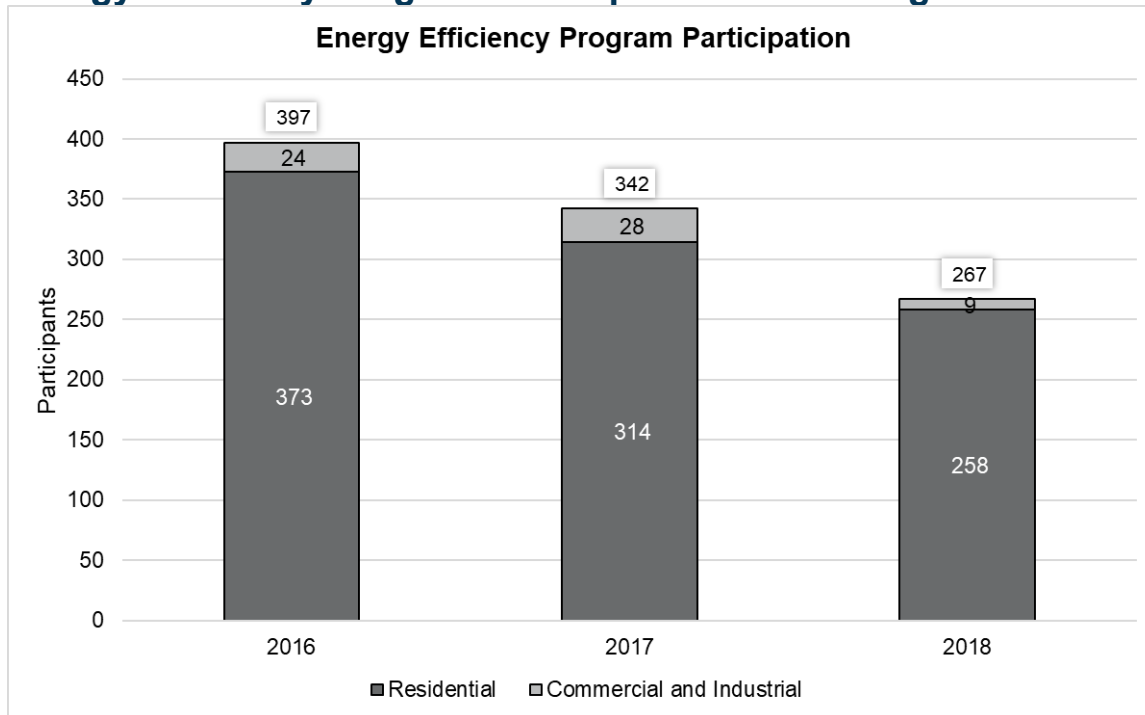


Figure 10. Superior Energy Efficiency Program Participation 2016-2018

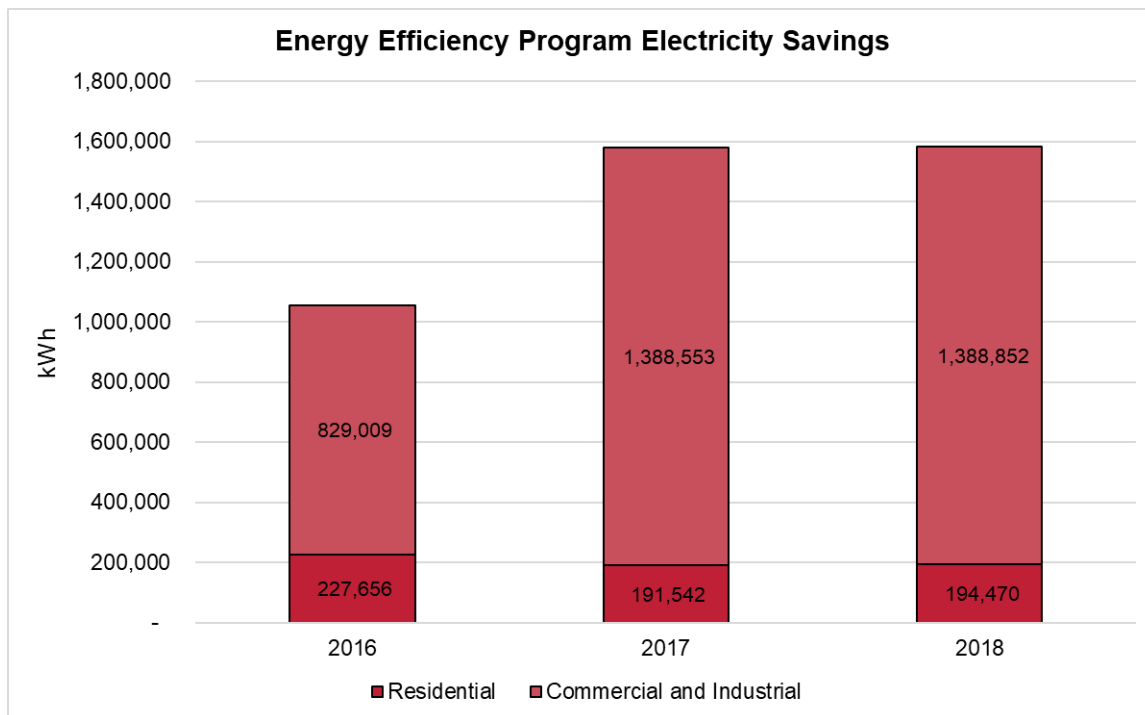


Figure 11. Superior Energy Efficiency Program Electricity Savings 2016-2018

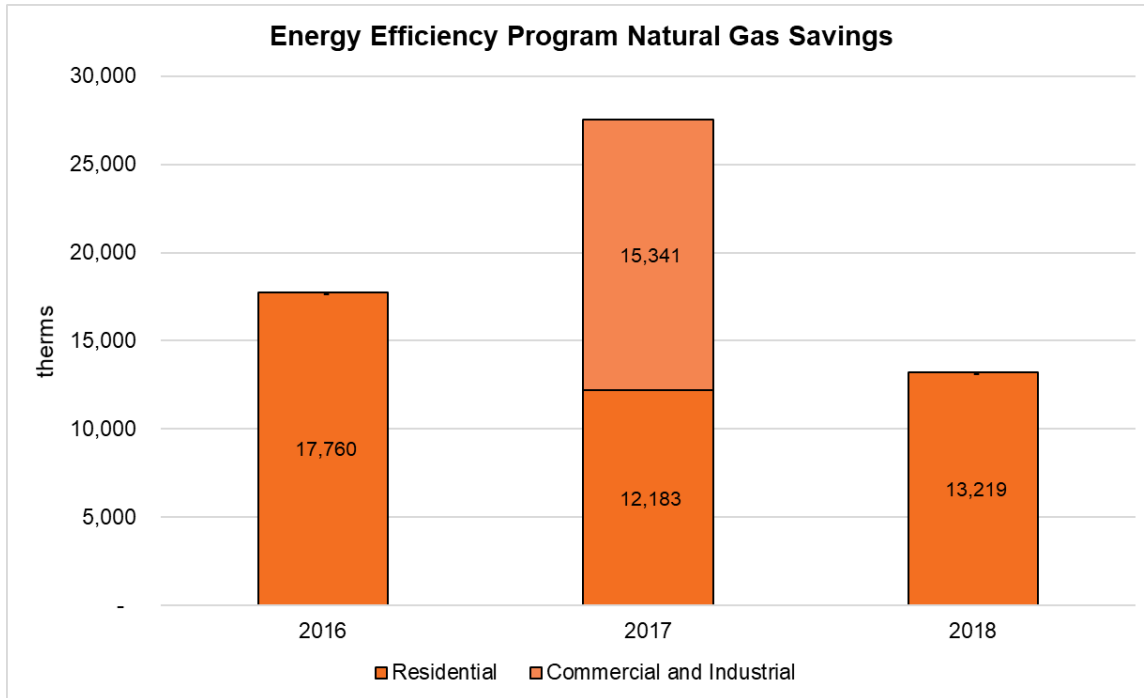


Figure 12. Superior Energy Efficiency Program Natural Gas Savings 2016-2018

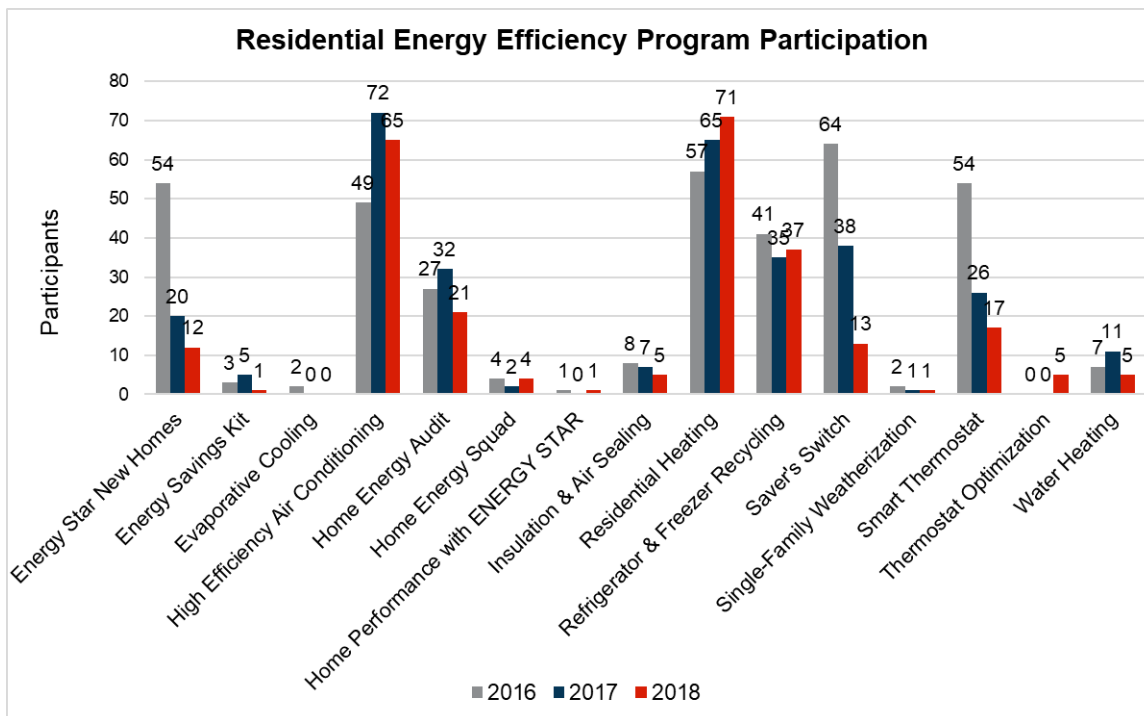


Figure 13. Superior Residential Energy Efficiency Program Participation Details 2016-2018

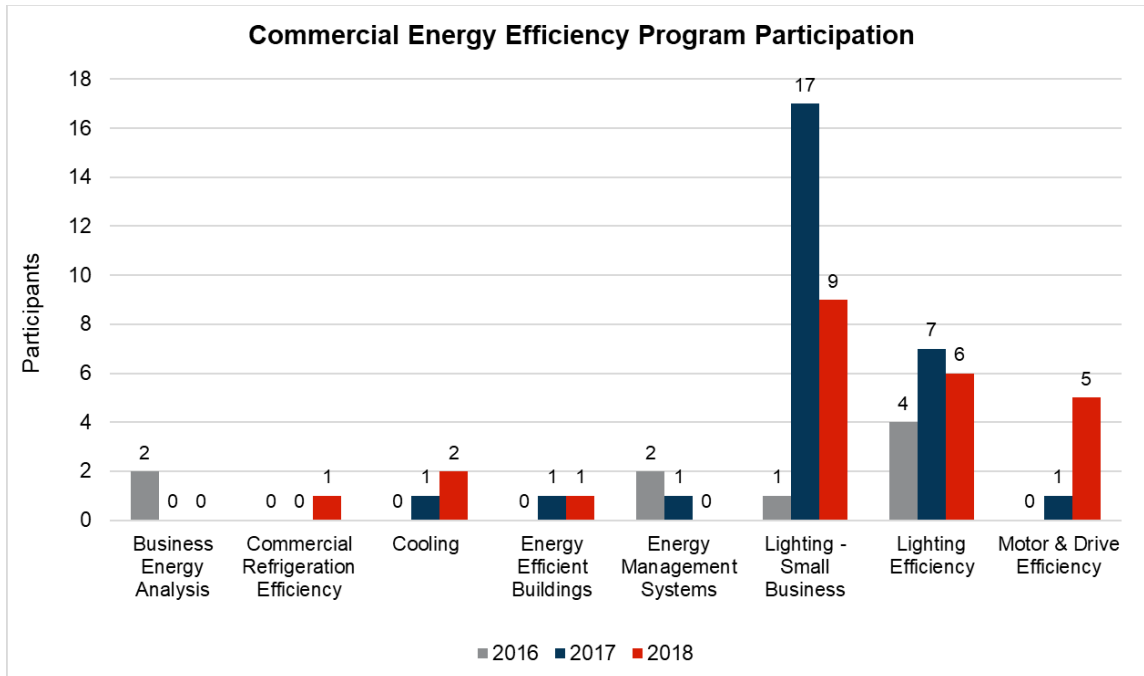


Figure 14. Superior Commercial Energy Efficiency Program Participation Details 2016-2018

Renewable Energy Program Participation

Residential Renewable Energy Program Participation	2016	2017	2018
Windsorce®	265	292	317
Renewable*Connect®	0	0	23
Solar*Rewards®	17	22	4
Non-Solar*Rewards® On-Site Solar	13	22	23
Solar*Rewards Community®	4	5	6

Commercial Renewable Energy Program Participation	2016	2017	2018
Windsorce®	2	2	2
Renewable*Connect®	0	0	0
Solar*Rewards®	0	0	0
Non-Solar*Rewards® On-Site Solar	0	0	0
Solar*Rewards Community®	1	3	2

Greenhouse Gas Emissions and Trends

2018 GHG Emissions (MTCO₂e)

62,827

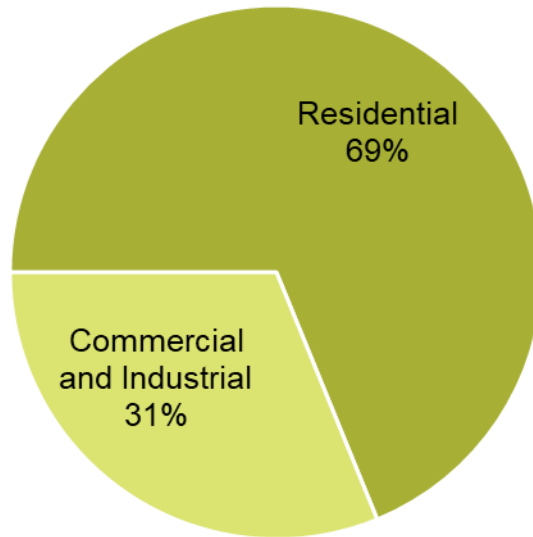


Figure 15. Superior Greenhouse Gas (GHG) Emissions by Sector 2018

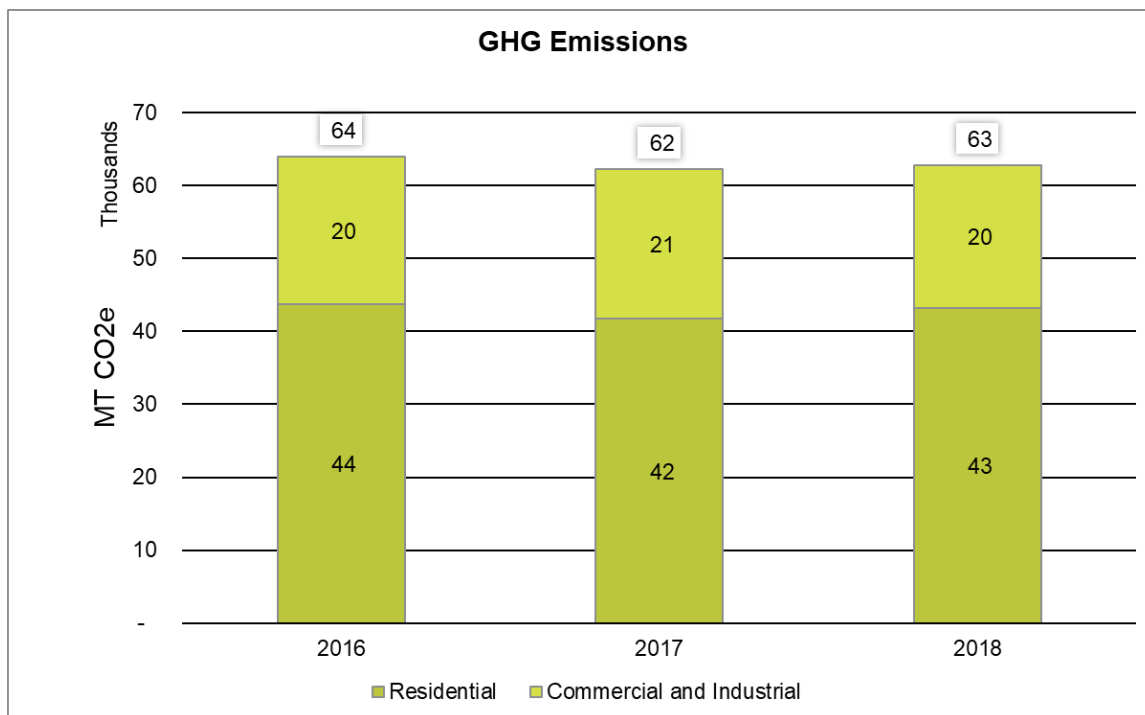


Figure 16. Superior Greenhouse Gas (GHG) Emissions 2016-2018

APPENDIX C: ACES RESIDENTIAL STUDY



Study Methodology and Results Overview

The following slide deck was presented to the ACES committee as a summary of the residential study methodology, finding, and next steps. In addition to energy, this study asked questions and shared collateral related to water and waste.

2019-2020 Superior Neighborhood Interventions and XCEL ENERGY PLAN Update

For ACES August 2020 Meeting

Presentation by
Lisa Skumatz, Dana D’Souza, Ann VanderVliet



2019-2020 Superior Neighborhood Interventions and XCEL ENERGY PLAN Update

History

- Xcel approached with Partners in Energy - community energy plan development assistance; other CO towns
- We applied; misunderstanding of content / effective delay; moved ahead / funding

Goals

- Set Energy goal – what is reasonable / achievable / tailored
- Develop Tailored strategies (where we went astray)
- Follow through, and measure



2019-2020 Superior Neighborhood Interventions Project

Interventions / Timeline (mid 2019 – mid 2020)



Design / Intervene

- Select 3 neighborhoods / metrics for similarities; differing interventions (covid)
- Pre-survey
- Focus Groups
- Messaging development
- Recycling Postcard
- Water Postcard
- Energy Flyer
- Periodic meetings with Xcel

Measure

- Pre-survey
- ~EOW Clicker on Trash & Recy set outs
- Recycling quiz / survey / prize
- Water quiz / survey / prize
- Energy flyer / commitment
- Oops tags in 1 neighborhood
- Weigh for recycling rate all 3 neighborhoods
- Inspect recycling contamination all 3 neighborhoods
- Post survey with Kit (pre-prize) and gift card prizes
- Pre/post WATER (Town) and ENERGY (Xcel) data



Water Impacts from Study (Pre-Post / Control)

2020 Superior Neighborhood Interventions



THANK YOU TOWN OF SUPERIOR FOR THE DATA!!!!

Water Usage Effects (data from Town of Superior, 68/neighborhood)

	Zeros excluded		Zeros included	
	Treatment	Control	Treatment	Control
Pre	4113	3048	4022	2824
Post	5519	4143	5397	3838
Difference	-1406	-1095	-1375	-1014
Pct Diff	-34%	-36%	-34%	-36%
Net Diff	-311	-8%	-361	-9%
Using Percentage Differences				
Pct Diff	-34%	-36%	-34%	-36%
Net Pct Diff	2%		2%	

Interventions were:

- Postcard Tips for reduced water use
 - Same for both Neighborhoods
 - Clothes wash temp & freq
 - Shorter showers, Low Flow Showerhead
 - Avoid pre-rising dishes for Dishwasher
 - Xeriscape Front yard

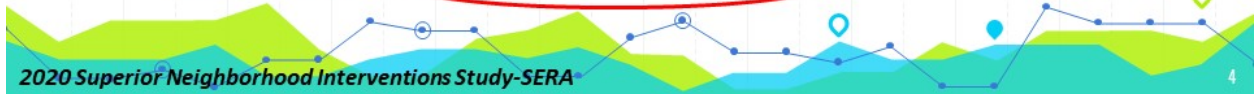
Quiz (web) with prize (energy kit)

Notes: Negative is HIGHER usage "after".

Pre is significantly higher in treatment; not "similar" (Some possible lawn differences incl. size)

Pre to Post is higher usage for both; higher starting use for Treatment swamps change for control.

Looking at percentage differences implies there MAY be a savings from program.



Energy Impacts from Study (Pre-Post / Control) 2020 Superior Neighborhood Interventions

Energy Effects (data from Xcel; MMBTu/HH) Per month

	Jan to June 2020			June 2019 to June 2020		
	North	South	Central/ Control	North	South	Central/ Control
PRE	6,644	7,499	6,863	1,551	2,169	2,042
POST	1,879	2,107	2,007	1,879	2,107	2,007
Difference	4,765	5,392	4,856	-328	62	35
Pct Diff	72%	72%	71%	-21%	3%	2%
Net Diff	-91	536		-363	27	
Using Percentages						
Pct Diff	72%	72%	71%	-21%	3%	2%
Net Pct Diff	1.0%	1.1%		-2.3%	1.1%	

NOTE: Negative implies higher usage

Interventions were:

- Flyer from Xcel / SERA re: Energy
- Same for both treatment neighborhoods
- Behavioral Tips (cold / full load clothes Wash; 5 min shower; computer off; fan Instead of A/C; full dishwasher)
- DIY Tips (LEDs, Adv. Power Strips, Weatherize door/windows; smart t-stat, Insulate water pipes)
- Xcel Programs Available (Home Energy Audit; LED discounts; Refrig Recy; Gas furnace rebate; Cooling rebate; renewables program) →
- + Commitments Challenge on flyer & web/prize

MAY be savings (about 1%) from flyer; some oddities in North Neighborhood

(Awaiting extra data from Xcel for statistical confidence And July, rather than June, data)



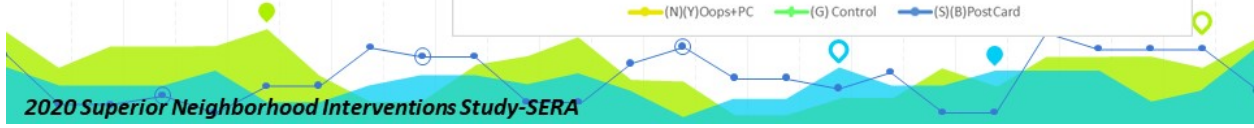
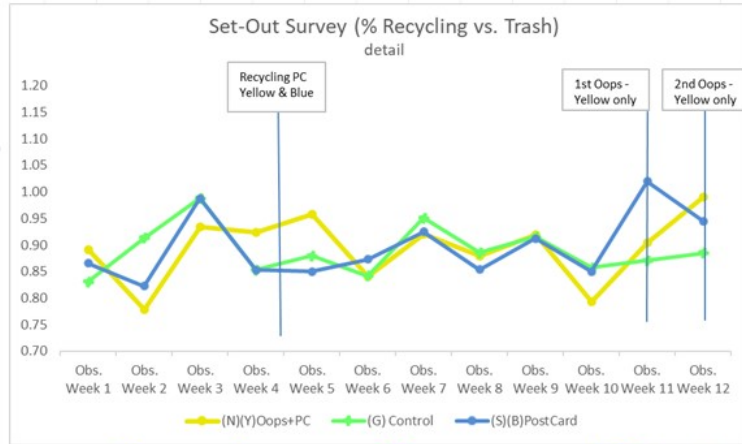
2020 Superior Neighborhood Interventions Study-SERA

DRILL DOWN ON RECYCLING RESULTS



Recycling Set Out Percent vs. Interventions

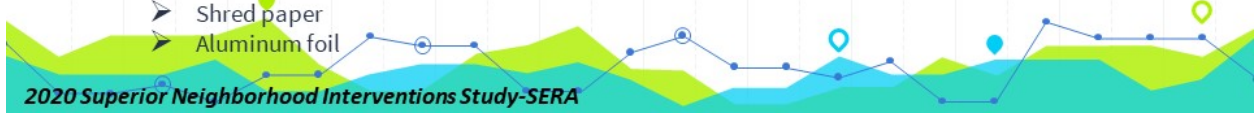
- Percent starts fairly high
- Bounces around 85% to 95% for all 3 neighborhoods
- Treatment neighborhoods end higher than Control, but not large effect



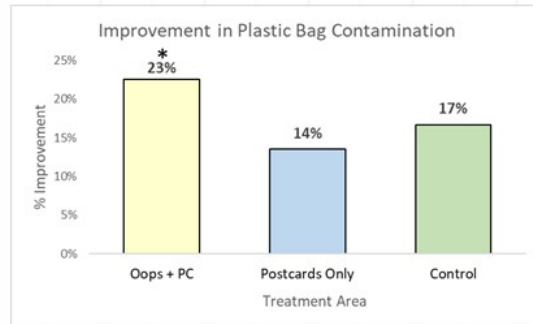
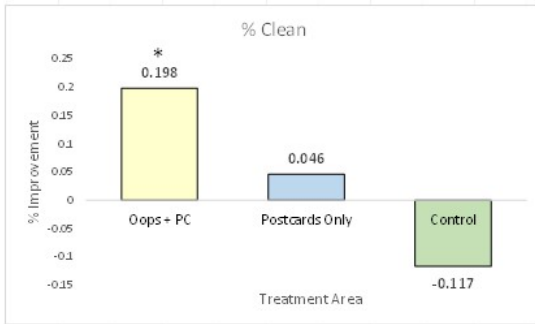
Knowledge of Correct Recyclables (Survey) Pre/ Post Postcard Correct Answers for Recyclability

- Highest final results in OOPS tag neighborhood; minimal changes in control area
- Biggest gains in
 - Coffee cups
 - Frozen boxes (more about that later)
 - Plastic lids
 - Shred paper
 - Aluminum foil

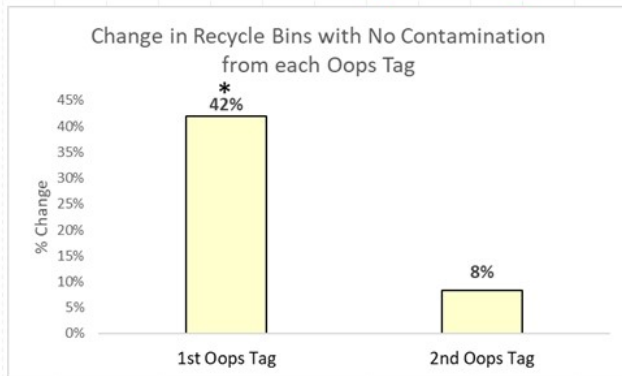
Area > Survey >	(Y) Oops + PC		(B) Postcards		(G) Control	
	Pre	Post	Pre	Post	Pre	Post
No Plastic Bags	89%	97%	85%	90%	86%	90%
Clear Clamshells Allowed	66%	74%	74%	74%	81%	66%
No Single Use Coffee Cups	56%	82%	63%	71%	62%	56%
No Frozen Food Containers	54%	81%	43%	56%	45%	60%
Metal Lids Recycled Off	72%	76%	71%	77%	74%	74%
Plastic Lids Left ON	41%	66%	51%	60%	44%	50%
No Shredded Paper	60%	82%	71%	79%	70%	74%
Clean, Balled Aluminum Allowed	64%	82%	71%	75%	73%	79%
No Foam / Take-out	86%	90%	78%	81%	84%	87%



Recycling Impacts from Study “Oops Tag” Effect 2020 Superior Neighborhood Interventions



Recycling Impacts from Study “Oops Tag” Effect 2020 Superior Neighborhood Interventions



1st Oops Tag-
Significant reduction in contamination

2nd Oops Tag-
Small to no additional reduction in contamination



Materials Improved by Outreach

	% Clean			Bagged Recycling			Amazon Mailers			Plastic Bags			Trash		
	Oops Tags	Postcards Only	Control	Oops Tags	Postcards Only	Control	Oops Tags	Postcards Only	Control	Oops Tags	Postcards Only	Control	Oops Tags	Postcards Only	Control
Pre	23%	39%	29%	10%	6%	n/a	11%	2%	n/a	32%	31%	29%	6%	6%	6%
Post	42%	44%	18%	8%	10%	19%	2%	13%	13%	9%	18%	13%	3%	5%	13%
Pct Diff	20%	5%	-12%	2%	-4%		8%	-11%		23%	14%	17%	3%	1%	-6%
Net Pct Diff	32%	16%								6%	-3%		9%	8%	

Oops tag neighborhood had best improvement in CLEAN recycling bins: 32% net increase
 Postcards also improved 16% (lower effort!), and control area worsened.

Oops tags reduced Plastic bag contamination from about 30% to less than 10% in Oops + Postcard area
 Plastic bags are a problem contaminant
 Other individual commodities were more difficult to tell; small sample and measurement.
 Oops generally seemed to outperform postcards only



Summary - Recycling Impacts from Study Contamination by Material 2020 Superior Neighborhood Interventions

Non-Problem Materials (under 10% contamination during study)	
Coffee Cups	Shredded Paper
Greasy Pizza Boxes	Crushed Containers
Problems Fixed by Outreach (contamination dropped to less than 10% in outreach areas)	
Postcard Effect	Oops Tag Effect
Trash	Overall Contamination
Bagged Recycling	Amazon Bubble Mailers
	Plastic Bags
Problems not Fixed by Outreach (Contamination remained above 10% in outreach areas)	
Frozen Food Boxes	
Non-Recyclable Paper	
Wrappers/Film	
Foam/Take-out*	* Contamination was under 10% but increased during study
Plastic Single-Use Cups*	



RESULTS RELATED TO SUPERIOR SUSTAINABILITY PROGRAMS / STRATEGIES (SURVEYS)



Support for Potential Sustainability Initiatives in Superior (survey)

Program Awareness and Interest

Program	%	Interest / Knowledge
PAYT	66%	in favor or interested
Recycling	86%	Extremely/ Very Important
Having more materials accepted in curbside recycling.	60%	Would like to see
Curbside compost w/ trash hauler)	64%	unaware
Superior YW Drop Off	64%	use or have used
Curbside collection of Yard Waste.	49%	Would like to see
Curbside collection of Food & Yard Waste.	58%	Would like to see
Water Conservation	81%	Extremely/ Very Important
Saving Energy in home	84%	Extremely/ Very Important
3-5% reduction	23%	Superior's Energy Goal
6%-10% reduction	31%	Superior's Energy Goal
11%-20% reduction	28%	Superior's Energy Goal



2020 Superior Neighborhood Interventions Study-SERA

Energy Plan / Strategies – Xcel Suggestions ACES may want to develop “Sustainability” Strategies



(EE) Strategy	Res Outreach	Biz Outreach	EE New Dev'p	EV Infra & Fleet
High Impact Focus	<ul style="list-style-type: none"> >Kits >Wx, Insul, Air Seal >Res Htg & Cooling >Home Effic Squad & Plus >Home Perf w/ES 	<ul style="list-style-type: none"> >Incr partic in Xcel Pgms >Self Direct >Liting effic >Custom effic (windows & tint, insul, geoth, roofing) >Motors & drives >Programs 	<p>Res</p> <ul style="list-style-type: none"> >Energy Star New Homes (ESNH) >Heating/ Cooling Equip't <p>Com'l</p> <ul style="list-style-type: none"> >Energy Design Assistance >EE Bldgs Program 	<ul style="list-style-type: none"> >2 new chargers by 2021 >Increase EV in Town Fleet by 2021
How to Implement	Social marketing	Emails Cold calls	Planning Dept, Bldg Dept Mailers, Developers, Chamber, "Next Door"	Study for locations, etc. Town Fleet manager Funding

Pre/Post Metrics plan, responsibilities, and details in draft 3 page summaries per strategy from Xcel



NEXT STEPS



ACES Next Steps

- Decide if want ENERGY plan or Sustainability Plan
 - Xcel cooperation / interaction with former; goals, strategy refinement, carry-through
 - Point person (qualifications)
 - Goal-setting → Discussion Now
- If Sustainability, review results of study to ID problem materials, potential messaging and bring community-wide
- Expand to consider commercial strategies
- Consider pre/post for impacts and progress – and Score Card!



ACES Next Steps

- Decide if want ENERGY plan or Sustainability Plan
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 - Goal-setting → Discussion Now
- If Sustainability, review results of study to ID problem materials, potential messaging and bring community-wide
- Expand to consider commercial strategies
- Consider pre/post for impacts and progress – and Score Card!
- → And Replace Member on ACES (Skumatz moving (☹))



Residential Study Energy Pre- and Post-Energy Survey

As part of a project for Town of Superior ACES, and in collaboration with Xcel Energy, Skumatz Economic Research Associates (SERA) conducted a social marketing project to test the effectiveness of outreach/education delivered on three aspects of sustainability - recycling, water conservation, and energy efficiency. Data were collected

for three neighborhoods – a control area, a partial treatment area (mailed outreach only), and a full treatment area (outreach plus interaction using oops tags).

This document summarizes the energy-related results from the post-survey (still in the field; currently about 100 responses), and some results from the Pre-survey, distributed in January (more than 200 responses). The results include data about behaviors, attitudes, recall, and intentions.

Figure 1: Xcel Energy Trifold Collateral



The other sections of the Xcel Energy flyer provided information about energy saving behaviors, actions, and DIY measures; and then provided Xcel Energy Program information. The corresponding survey asked participants to commit to take action and to indicate a date by which time they would begin this action. Below are the following three areas and the corresponding survey responses.

1) Behaviors

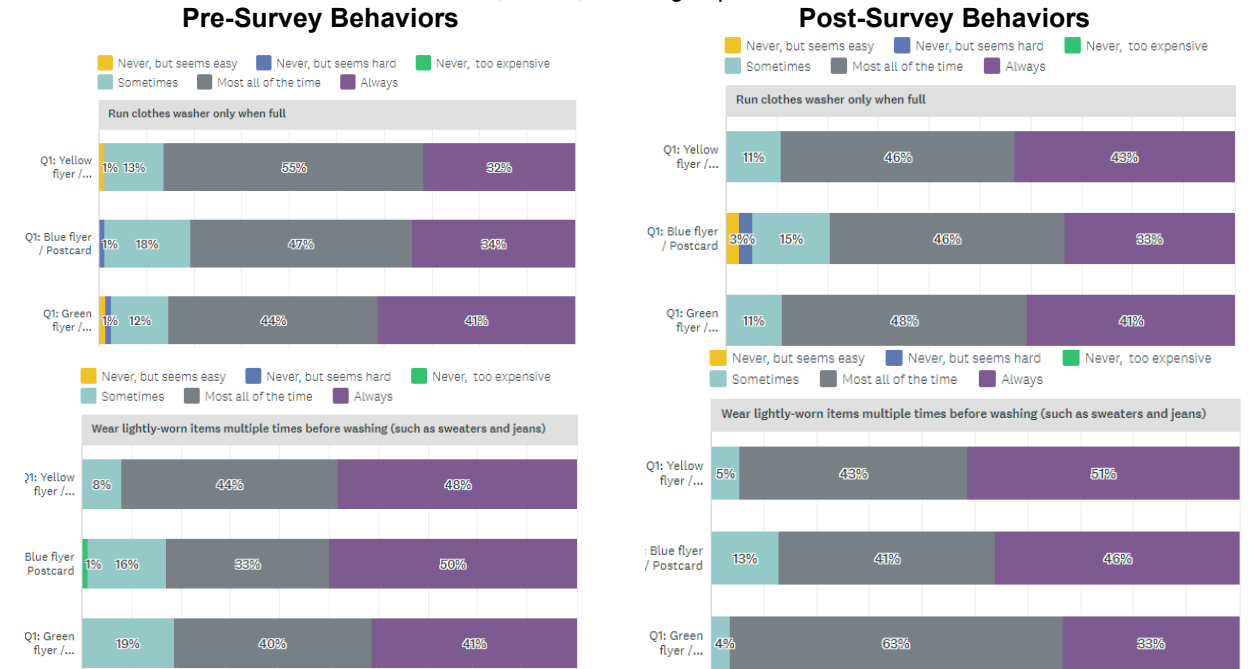
- Only wash your clothes if you have a full load, use the cold-water cycle when you do, and wear lightly-worn clothes multiple times between laundering (save up to \$60/yr)
- Reduce your shower time to 5 minutes or less (save about 3.5 gallons/minute (20% of an average energy bill is water heating))
- Turn off your computers rather than leaving on standby (saves up to \$15-56/year/computer).
- Turning off a laser printer (saves up to \$130/yr)

- Use a fan 25% of the time that you would typically use A/C (40% of your bill is heating/cooling)
- Run your dishwasher only when it's full (saves up to \$.50 for each avoided load)

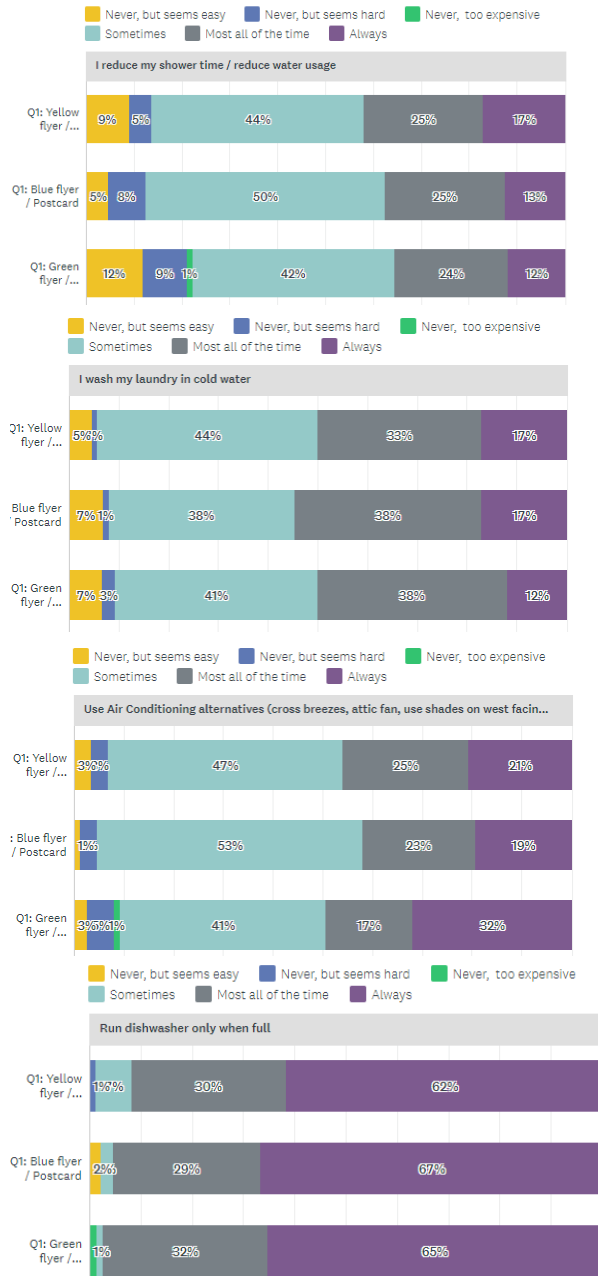
Figure 2: Behavior Commitments and Start Dates (Responses: Yellow and Blue Areas only)



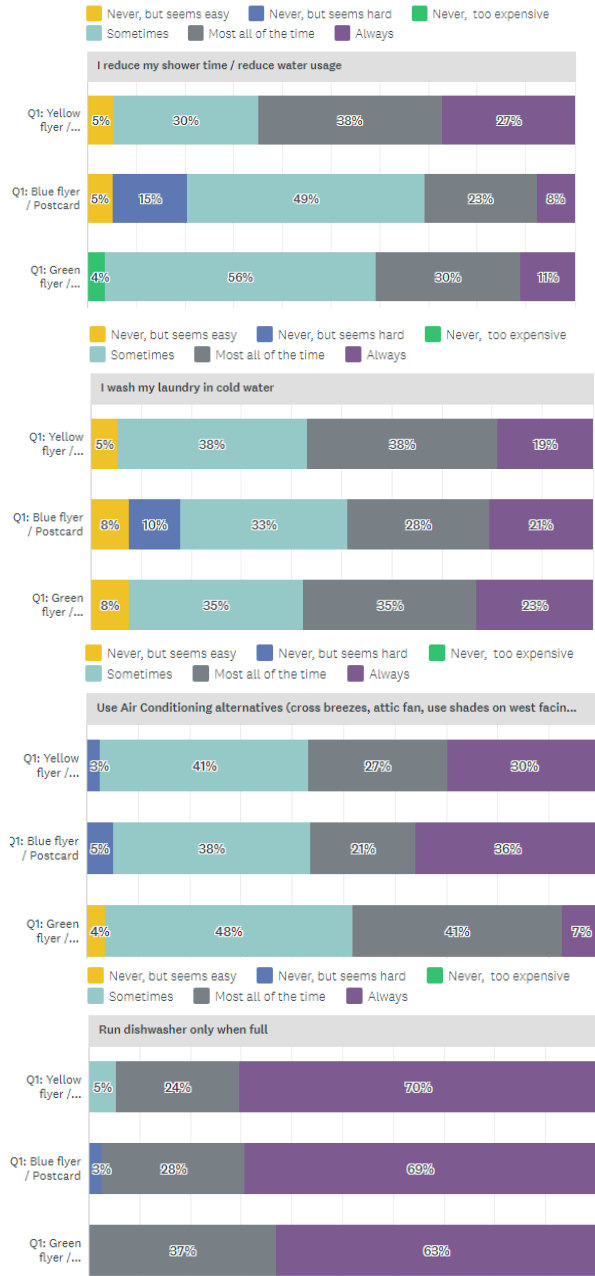
Figure 3: Behaviors: Before and After Xcel Energy Flyer
 Yellow and Blue Received Outreach Materials; Green, control group - no outreach materials.



Pre-Survey Behaviors



Post-Survey Behaviors



2) Actions/Equipment

- Replace non-light-emitting diode (LED) lightbulbs in your house with LEDs; boost your impact by doing so in high-use rooms (saves \$15/bulb/year and lasts more than 10 years)
- Install advanced power strips that turn off electronics when the main power source is turned off (“vampire” loads can cost homes \$200/year!)
- Weatherize your doors and windows to eliminate leaks (reduce energy use 5-10%)

- Install and program a programmable or smart thermostat (reducing 1 degree saves 3% on heating bill)
- Insulate your water pipes (insulated water pipes can raise water temperature 2°F–4°F higher than uninsulated pipes)

Figure 4: Actions and Equipment Commitments

DYI- Please let us know which of these you pledge to do and by what date.

Answered: 6 Skipped: 304

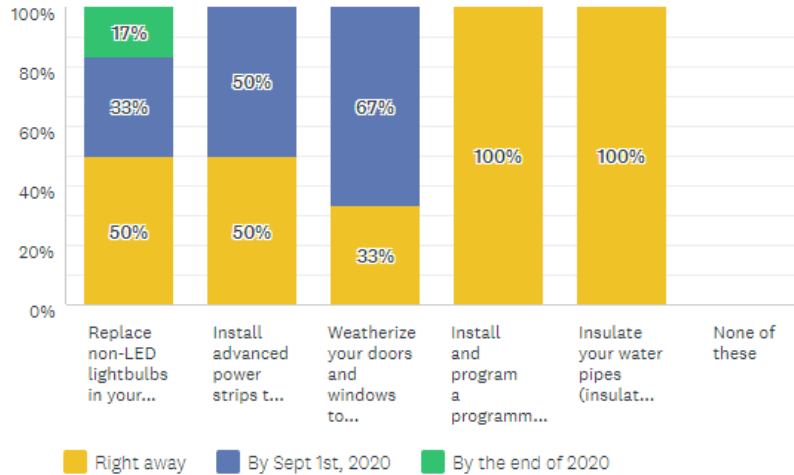
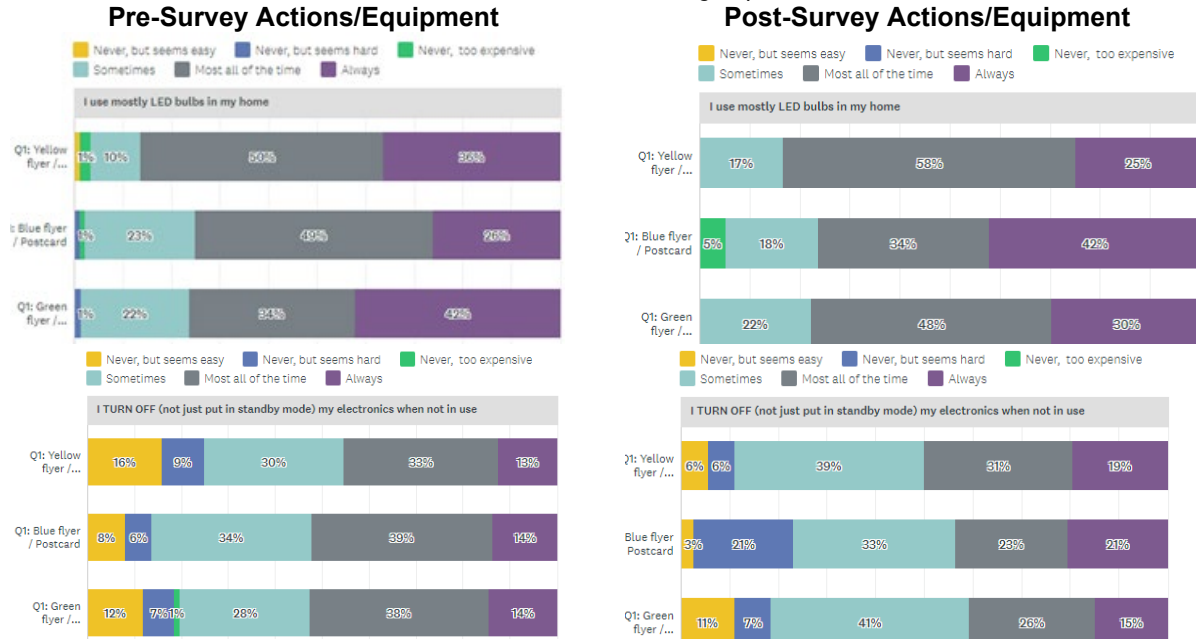
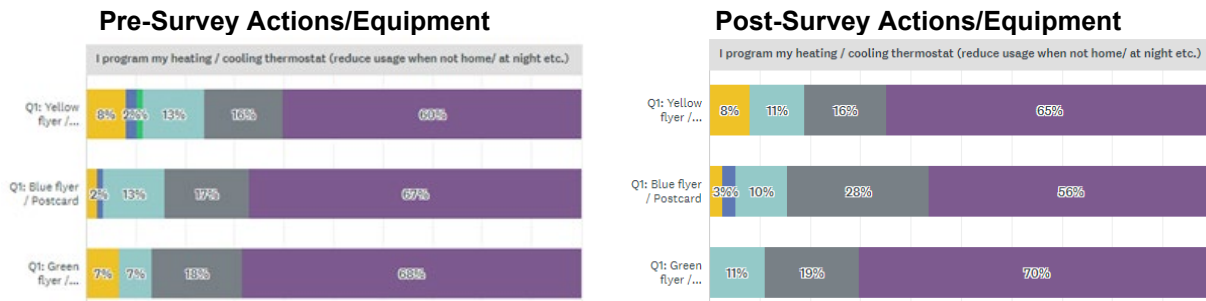


Figure 5: Actions and Equipment: Before and After Xcel Energy Flyer

Yellow and Blue Received Outreach Materials; Green was control group; no outreach materials.





3) Xcel Energy Programs

- Home Energy Audit: see where you could be saving
- LED discount: get money back on your DIY commitment
- Refrigerator Recycling: Earn money for that old fridge or freezer
- Bring on the Heat: Rebates are available for 95% or greater efficiency furnaces
- Cash in On Cool Rebates: replace your cooling system and save big
- Renewables to Fit Your Needs: invest in solar or wind programs for a greener energy source

Figure 6: Xcel Energy Program Commitments

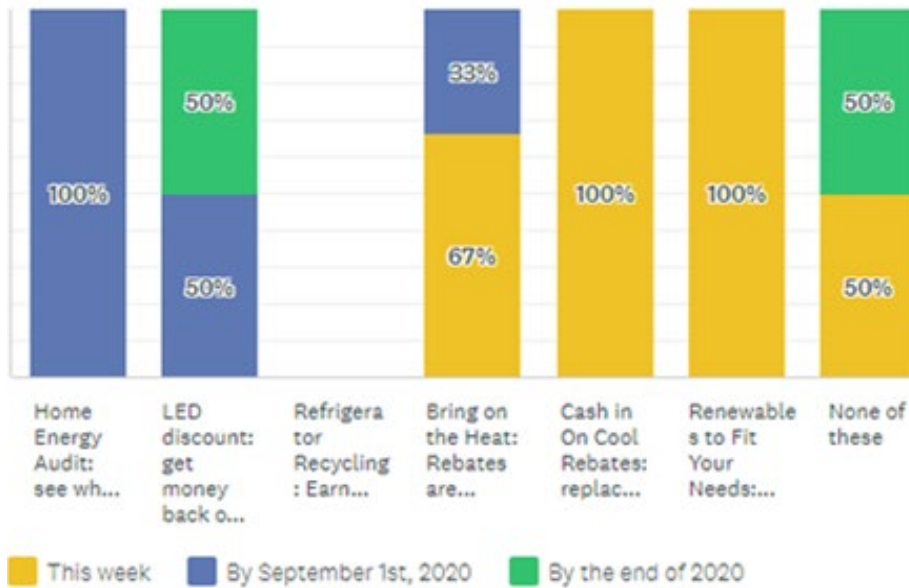


Figure 7: Post Xcel Energy Flyer Recall

Do you recall receiving a colorful energy efficiency tips flyer a couple weeks ago?

Answered: 101 Skipped: 14

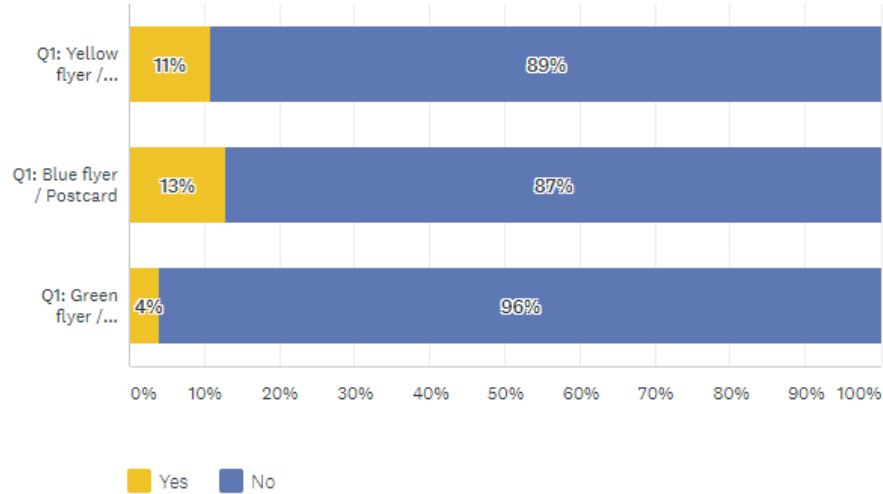
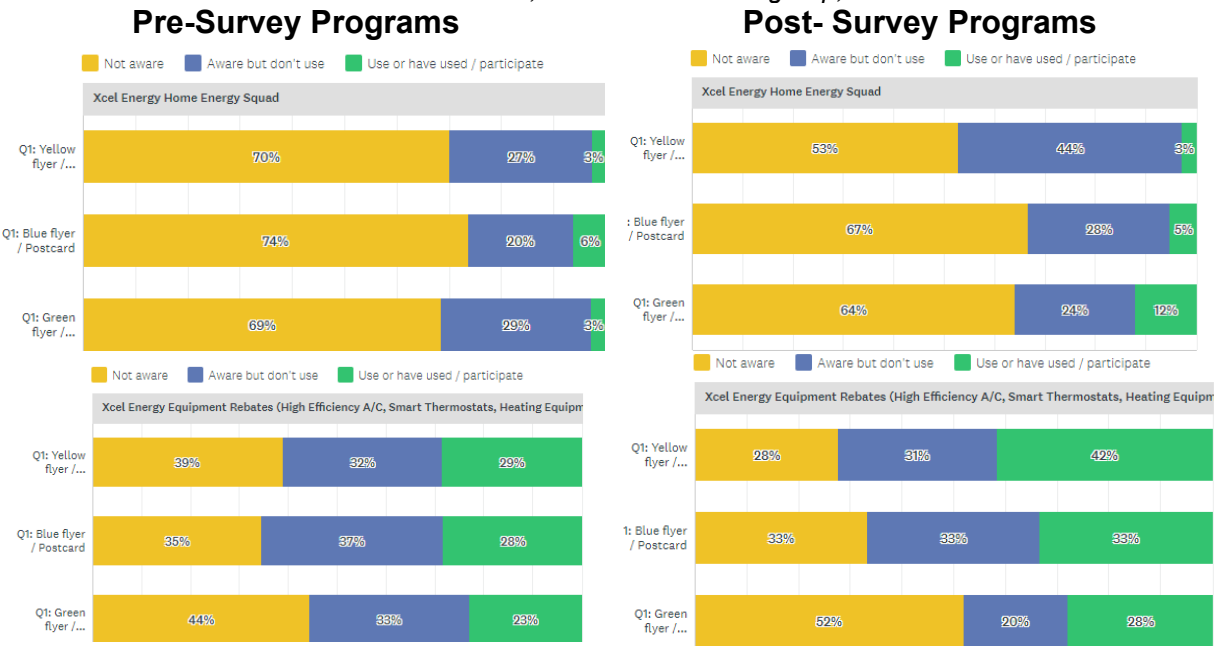
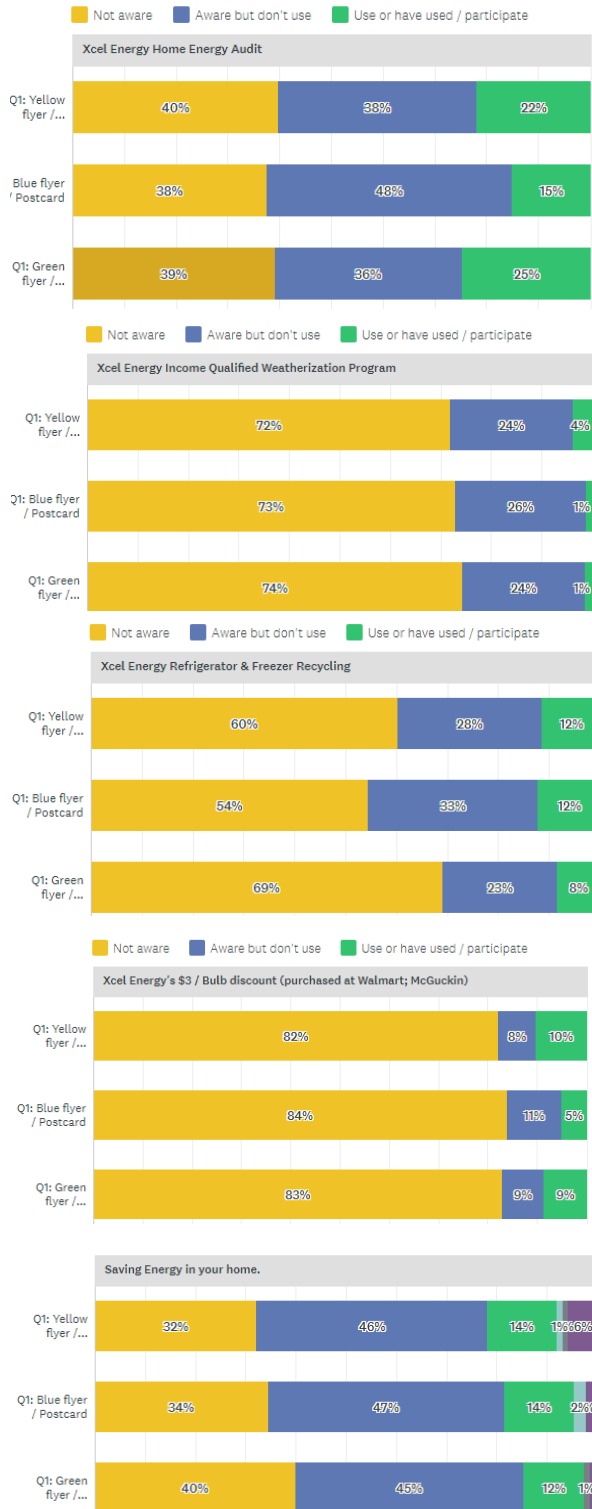


Figure 8: Programs: Before and After Xcel Energy Flyer

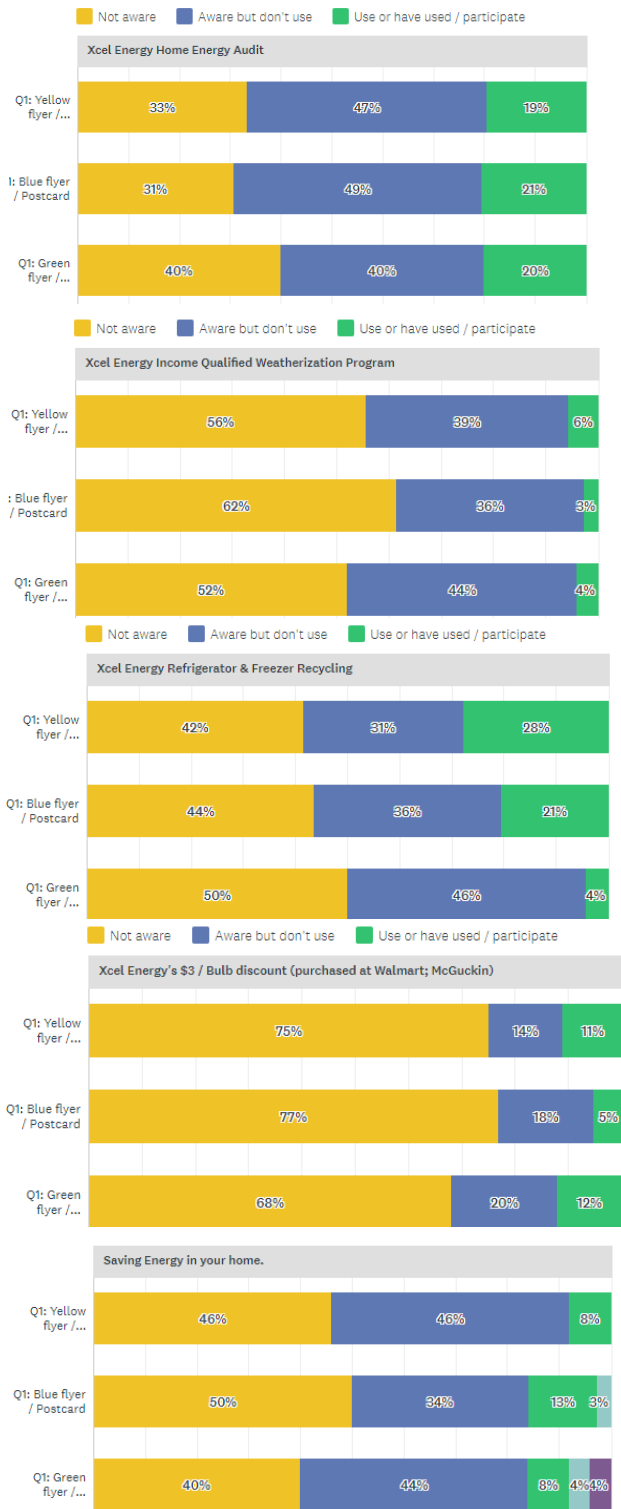
Yellow and Blue Received Outreach Materials; Green was control group; no outreach materials.



Pre-Survey Programs



Post-Survey Programs



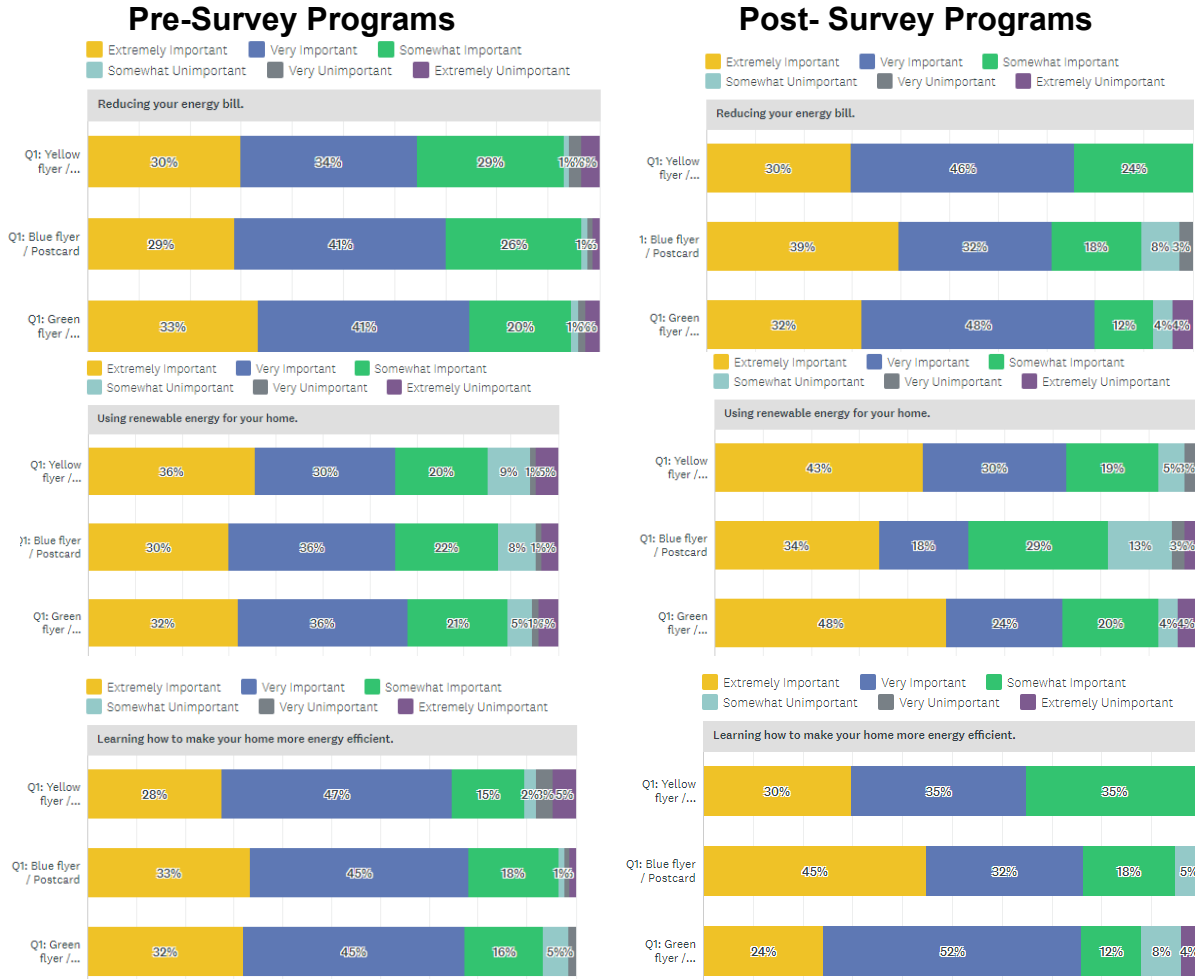


Figure 9: Pre-Survey Electric Vehicles Ownership
Does your household own any electric vehicles?

Answered: 249 Skipped: 13

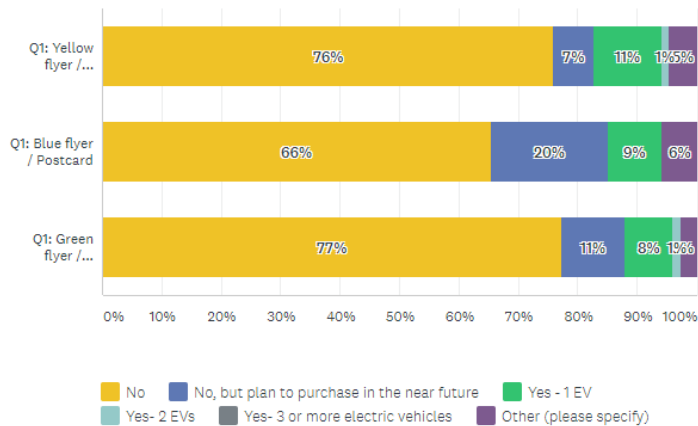


Figure 10: Electric Vehicles Charging

Where do you charge your vehicle? (check all that apply)

Answered: 25 Skipped: 237

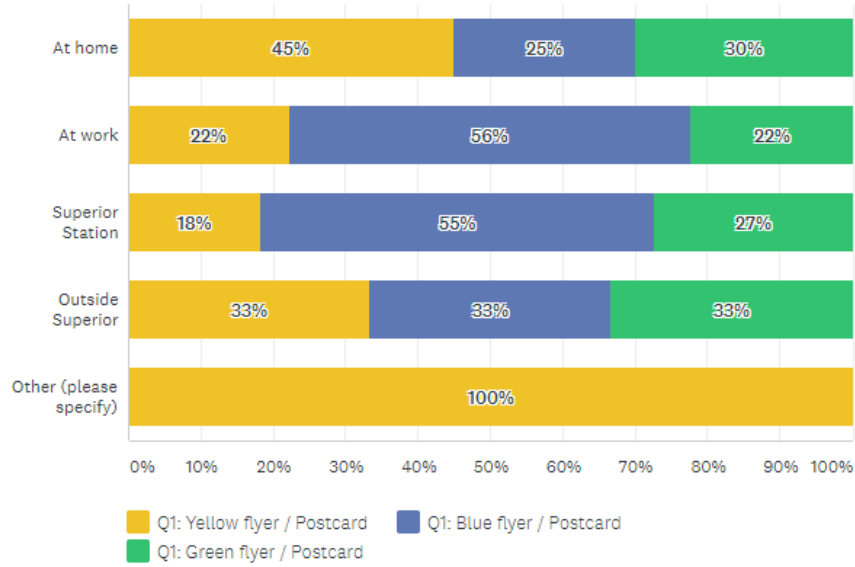


Figure 11: Bill Satisfaction

How would you describe your satisfaction level with the following?

Answered: 156 Skipped: 106

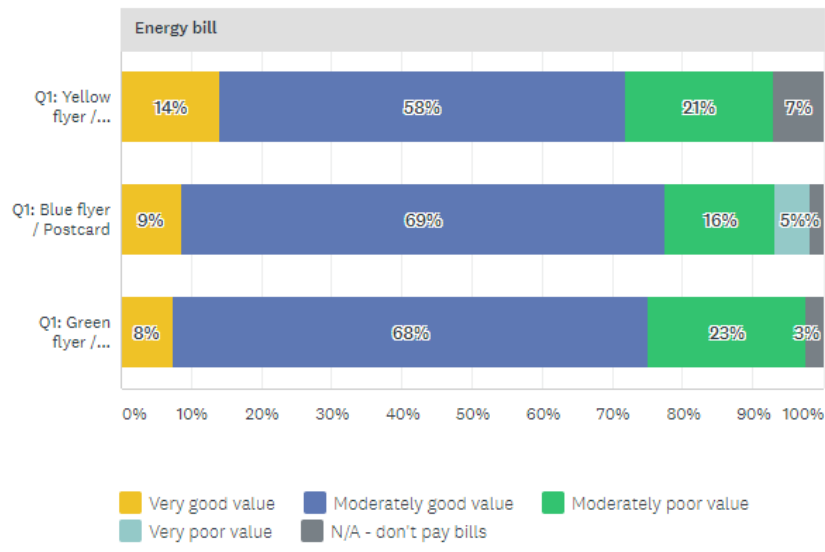


Figure 12: Equipment in Households

Please list which of the following you have in your household

Answered: 249 Skipped: 13

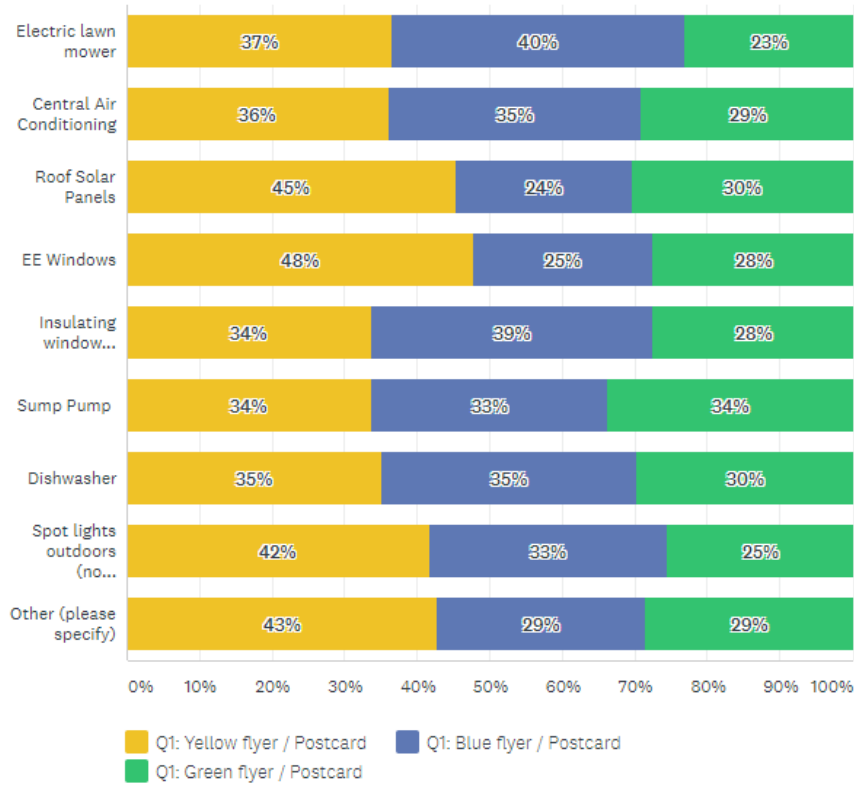
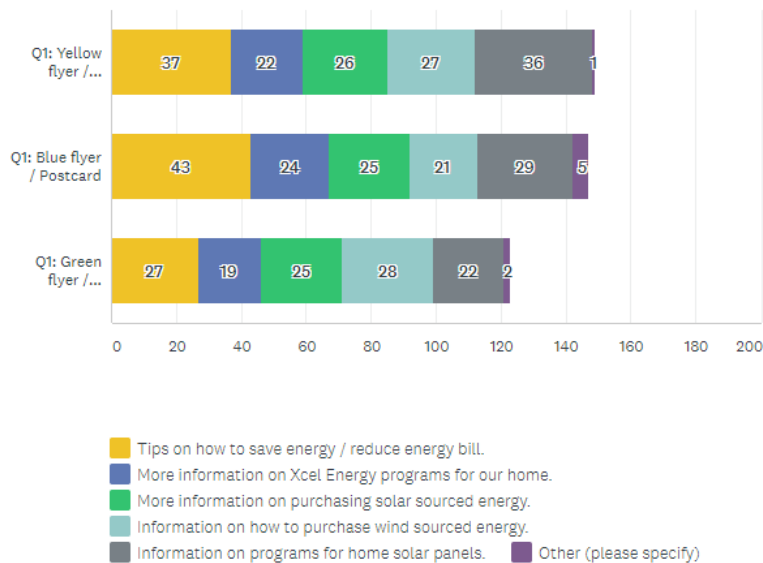


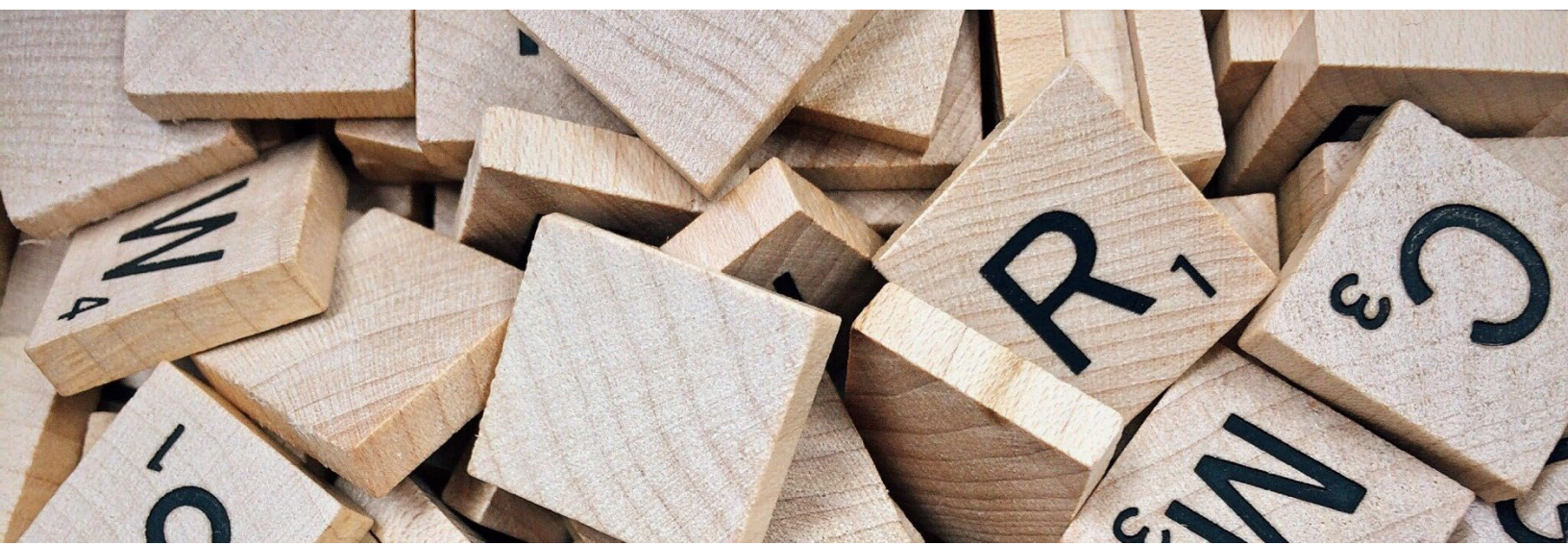
Figure 13: Energy Related Options

Which of the following would you like to see? (Check all that apply)

Answered: 249 Skipped: 13



APPENDIX D: GLOSSARY OF TERMS



15 x 15: Xcel Energy's privacy rule, which requires all data summary statistics to contain at least 15 entities, with no single entity responsible for more than 15 percent of the total. Following these rules, if a premise is responsible for more than 15 percent of the total for that data set, it is removed from the summary.

Community Data Mapping: A baseline analysis of energy data in a geospatial (map) format across the community.

Demand Side Management (DSM): Modification of consumer demand for energy through various methods, including education and financial incentives. DSM aims to encourage consumers to decrease energy consumption, especially during peak hours or to shift time of energy use to off-peak periods, such as nighttime and weekend.

Direct Installation: Free energy-saving equipment installed by Xcel Energy or other organization for program participants that produces immediate energy savings.

Energy Burden: Percentage of gross household income spent on energy costs.

Greenhouse Gases (GHG): Gases in the atmosphere that absorb and emit radiation and significantly contribute to climate change. The primary greenhouse gases in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

Grid Decarbonization: The current planned reduction in the carbon intensity of electricity provided by electric utilities through the addition of low- or no-carbon energy sources to the electricity grid.

Kilowatt-hour (kWh): A unit of electricity consumption equal to 1,000 watts (1 kW) being used for one hour.

Million British Thermal Units (MMBtu): A unit of energy consumption that can be used to measure **both** electricity and natural gas consumption, allowing them to be combined.

Metric Tons of Carbon Dioxide Equivalent (MTCO_{2e}): A unit of measure for greenhouse gas emissions. The unit "CO_{2e}" represents an amount of a greenhouse gas whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO₂), based on the global warming potential (GWP) of the gas.

Megawatt (MW): A unit of electric power equal to 1 million watts.

Premise: A unique identifier for the location of electricity or natural gas service. In most cases it is a facility location. There can be multiple premises in a single building, such as a strip mall with multiple tenants, and a customer account can have multiple premises at a single site.

Renewable Energy Certificate (REC): For every megawatt-hour of clean, renewable electricity generation, a renewable energy certificate (REC) is created. A REC embodies all of the environmental attributes of the generation and can be tracked and traded separately from the underlying electricity. Also known as a Renewable Energy Credit. Ownership of the REC is tied to being able to claim you use renewable energy.

Resilience: The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.

Recommissioning: An energy efficiency service focused on identifying ways that existing building systems can be tuned-up to run as efficiently as possible.

Community Solar Garden: Centralized solar array with subscribers who receive bill credits from the utility for the electricity produced from their portion of the array

Solar Photovoltaic (PV): Solar cells/panels that convert sunlight into electricity (convert light, or photons, into electricity, or voltage).

Subscription: An agreement to purchase a certain amount of something in regular intervals.

Therm (thm): A unit of heat that is used to measure natural gas consumption.

Trade Partner: Trade Partners, also known as Trade Allies or Business Trade Partners, are vendors and contractors who work with business and residential customers servicing, installing, and providing consulting services regarding the equipment associated with utility rebate programs. Their support for utility programs can range from providing equipment and assisting with rebate paperwork, to receiving rebates for equipment sold.