Town of Superior℠

A Beneficial Electrification Plan for Superior

September 2023

Xcel Energy®

PARTNERS IN ENERGY
An Xcel Energy Community Collaboration

ACKNOWLEDGEMENTS

Thank you to the following individuals who contributed many hours of service to developing this Beneficial Electrification Plan. The content of this plan was derived from one stakeholder workshop and a series of stakeholder interviews hosted by Xcel Energy's Partners in Energy. Xcel Energy is the main electric and natural gas utility serving Superior.

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This Beneficial Electrification Plan was funded by and developed in collaboration with Xcel Energy's Partners in Energy. Partners in Energy shall not be responsible for any content, analysis, or results if the Town of Superior has made modifications to the plan.

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Superior's Beneficial Electrification Vision

The Town of Superior aspires to be a leader in environmental sustainability and to unleash its full potential to eliminate greenhouse gas emissions from the community.

Measurable Goals to Evaluate Progress

This Beneficial Electrification Plan aligns with multiple Town of Superior and Boulder County goals. However, two primary goals are guiding this process:

- Reduce community-wide greenhouse gas (GHG) emissions 25% by 2025* by advancing the adoption of electric building equipment and electric cars.
- 30% of light-duty vehicles registered in Superior will be battery electric vehicles (BEVs) by 2030.

**Compared to 2016 emissions*

Our Beneficial Electrification Roadmap

Three strategies were identified to guide progress toward this plan's vision and goals:

Strategy 1: Electrification of Existing Properties

Strategy 2: Support All-Electric New Development

Strategy 3: Explore Electrification Opportunities for Town Fleet and Facilities

Town of Superior

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INTRODUCTION

What is Beneficial Electrification Plan

Beneficial electrification is simply the act of replacing gas- or diesel-powered equipment with electricity-powered equipment (Figure 1). For instance, you might replace a gas-powered vehicle with an electric vehicle, or a gas furnace with an electric furnace! Electrification is considered “beneficial” when the replacement reduces operational costs or reduces greenhouse gas emissions.

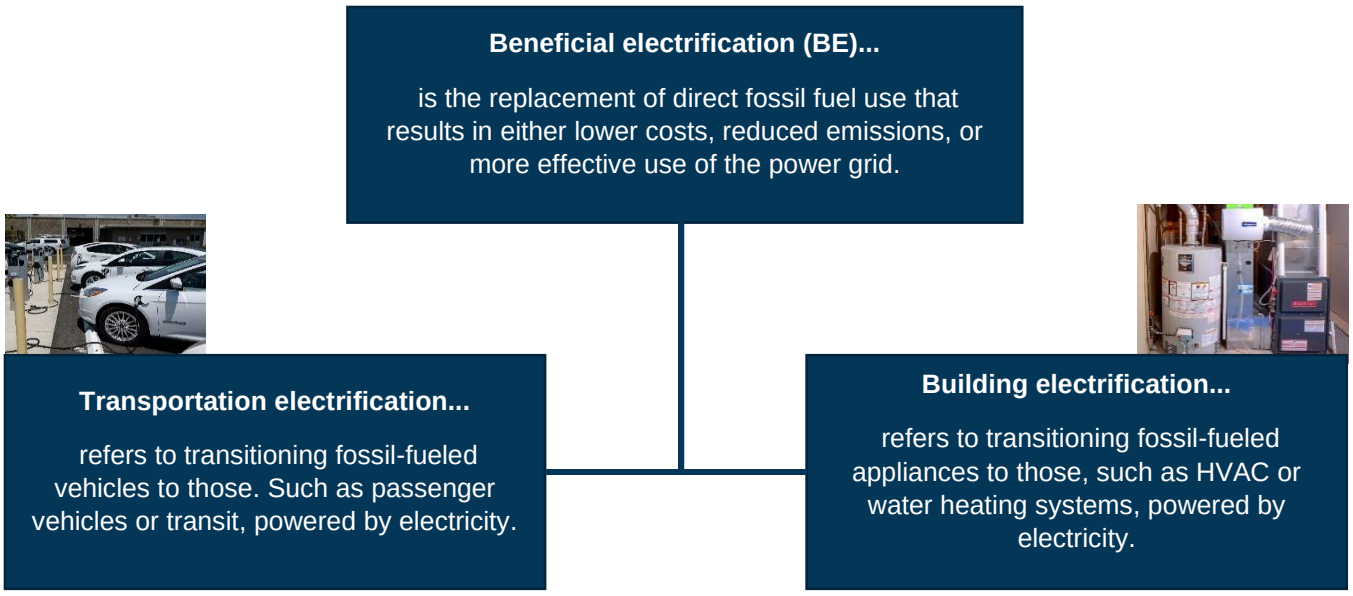


Figure 1. Beneficial electrification has two components: transportation electrification and building electrification.

This Beneficial Electrification Plan is a roadmap to guide Superior toward reducing greenhouse gas emissions in its energy supply, building, and transportation sectors. In the transportation sector, this plan is focused on increasing the adoption of light-duty Battery Electric Vehicles (BEVs) Unlike hybrids and plug-in hybrids, BEVs are powered entirely by electricity.

Defining Vehicle Types

Battery Electric Vehicle (BEV): An all-electric vehicle, fueled by plugging into an external charger, that has no tailpipe emissions. Requires low maintenance costs. Examples include Tesla vehicles and the Nissan Leaf.

Plug-in Hybrid Electric Vehicle (PHEV/PEV): Contains both an electric motor and a gasoline engine. An external plug is used to fuel the electric motor. The electric motor is used until the battery is depleted; at this point the gasoline engine takes over. Offers lower tailpipe emissions than traditional internal combustion engine (ICE) vehicles and longer ranges than most BEVs.

Hybrid Electric Vehicle (HEV): Contains both an electric motor and a gasoline engine. The gasoline engine powers a generator that charges the electric motor. No external battery charger is used. Runs at a constant speed, which increases fuel efficiency.

Taking a holistic approach to electrification can reduce infrastructure costs, improve resiliency, and make life easier for community members, developers, and the Town. The components of Superior's Beneficial Electrification Plan are detailed below.

Introduction	Defines electrification and related core concepts, states Superior's motivations for developing a Beneficial Electrification Action Plan, and describes how this plan fits into related energy and sustainability plans and initiatives.
Our Beneficial Electrification Future	Describes Superior's beneficial electrification vision and goals.
How We Get There	Identifies the three key strategies to achieving the vision and goals, along with targets that quantify success in each strategy.
How We Stay on Course	Outlines how Superior will track progress toward targets, goals, and vision, and how it will adapt to a changing landscape during implementation.
Appendices	Provides additional information about key drivers, available funding and opportunities for electrification in Town facilities, glossary of terms and work cited.

About This Planning Process

The creation of this Beneficial Electrification Plan was a 12-month process to help characterize Superior's beneficial electrification landscape, to identify a unifying vision for our electrification future, and to develop engaging strategies to guide change toward that vision. Starting in May 2022, a Project Management Team was formed to select a stakeholder group, inform stakeholder outreach, and guide the development of this action plan. This Project Management Team included Superior's Sustainability Coordinator and Sustainability Analyst, the Advisory Committee for Environmental Sustainability (ACES) chair, Partners in Energy Facilitators, and Xcel Energy representatives. An initial planning workshop was held in September 2022, with a planning team committed to representing local energy priorities in collaboration with the Town of Superior and Xcel Energy Partners in Energy; collectively, this group is referred to as the Beneficial Electrification Action Team. Following the workshop, interviews were conducted with key members of the Beneficial Electrification Action Team to identify key barriers and opportunities to advance Superior's beneficial electrification vision.

With its Energy Action Plan and this Beneficial Electrification Plan, the Town of Superior is part of a network of more than 35 Colorado communities that have developed and implemented Energy Action Plans through Xcel Energy's Partners in Energy offering. Partners in Energy also supports 18 months of plan implementation in the form of marketing and communications, data tracking and analysis, mapping, program expertise, and project management. Implementation of this plan will begin immediately after the plan is finalized.

Drivers of Electrification in Superior

Beneficial electrification can reduce greenhouse gas emissions, reduce operational costs, and increase resiliency. In short, beneficial electrification is in direct alignment with Superior's goals to be, "superior", when it comes to all things related to sustainability. This section summarizes some of the general drivers of electrification. For a more comprehensive overview, explore Appendix A: Drivers of Electrification in Superior.

Reducing our Greenhouse Gas (GHG) Emissions

Beneficial electrification reduces greenhouse gas emissions in two ways:

1) Leveraging renewable energy and
2) Improving equipment efficiency

In Superior, electric equipment is primarily powered by Xcel Energy's electricity grid, which includes a portfolio of renewable energy and a commitment to carbon free electricity by 2050. Electric equipment can also be powered by on-site renewable energy.

In both the building and the transportation sector, electric technology can be up to three times as efficient as its natural gas and gasoline-powered counterparts (RMI, 2022) (Energy Sage, 2022). Furnaces convert fuel to energy through combustion, and some energy is always lost in the process. Conversely, heat pumps simply transfer the energy, which eliminates the energy loss potential associated with combustion. Similarly, gas powered vehicles only convert about 30% of fuel energy into kinetic energy, while electric vehicles convert up to 80% of fuel energy to kinetic energy (U.S. Department of Energy, 2022).

In both the building and the transportation sector, electric technology can be up to three times as efficient as its natural gas (methane) and gasoline-powered counterparts (RMI, 2022) (Energy Sage, 2022). Furnaces convert fuel to energy, and some energy is always lost in the conversion process. Conversely, heat pumps simply transfer the energy, which eliminates the energy loss potential associated with conversion. Similarly, gas powered vehicles only convert about 30% of fuel energy into kinetic energy, while electric vehicles convert up to 80% of fuel energy to kinetic energy (U.S. Department of Energy, 2022). More efficient technology can help community members save on operational costs, because less fuel is required to achieve the same output.

Saving on Operational Costs

In Colorado, electric equipment is also less costly to power and less vulnerable to price fluctuations (Figure 2). For instance, electric vehicles boast a 50% lower total cost of ownership compared to a gas-powered vehicle (Forbes, 2018).

Xcel Energy has an established goal of making it possible to drive an EV for the equivalent of $1 or less per gallon of gasoline.

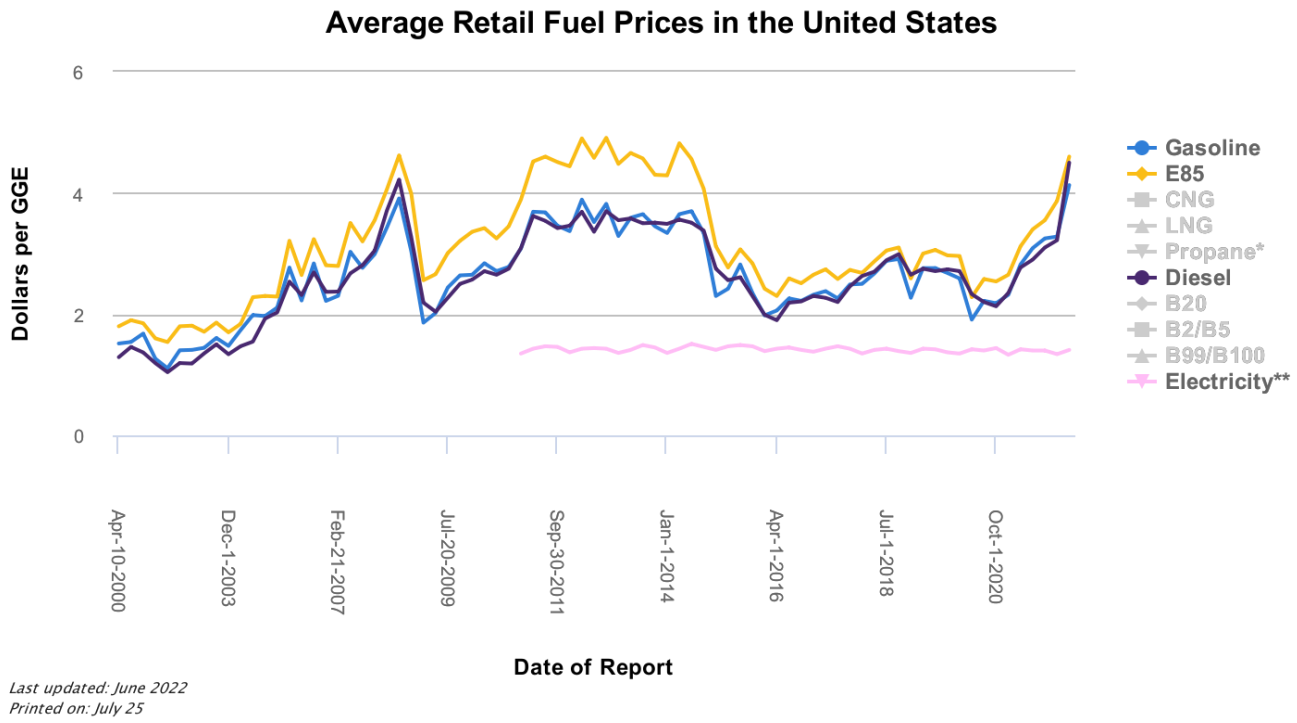


Figure 2. 2022Average Retail Fuel Prices in the United States for Gasoline, E85, Diesel, and Electricity.

Leveraging our Head Start on EV Adoption

EV adoption is escalating nationwide (Figure 3). In Colorado, EVs comprised 10.5% of all new car sales in 2022, increasing from 6.5% in 2021 (State of Colorado, 2023). In total, EVs make up 1.5% of Colorado's light-duty market share.

In Boulder County, 2% of all registered vehicles are Battery Electric Vehicles (BEVs). By comparison, BEVs make up 3% of registered vehicles in Superior, demonstrating Superior's leadership in this area (Boulder County DMV, 2021).

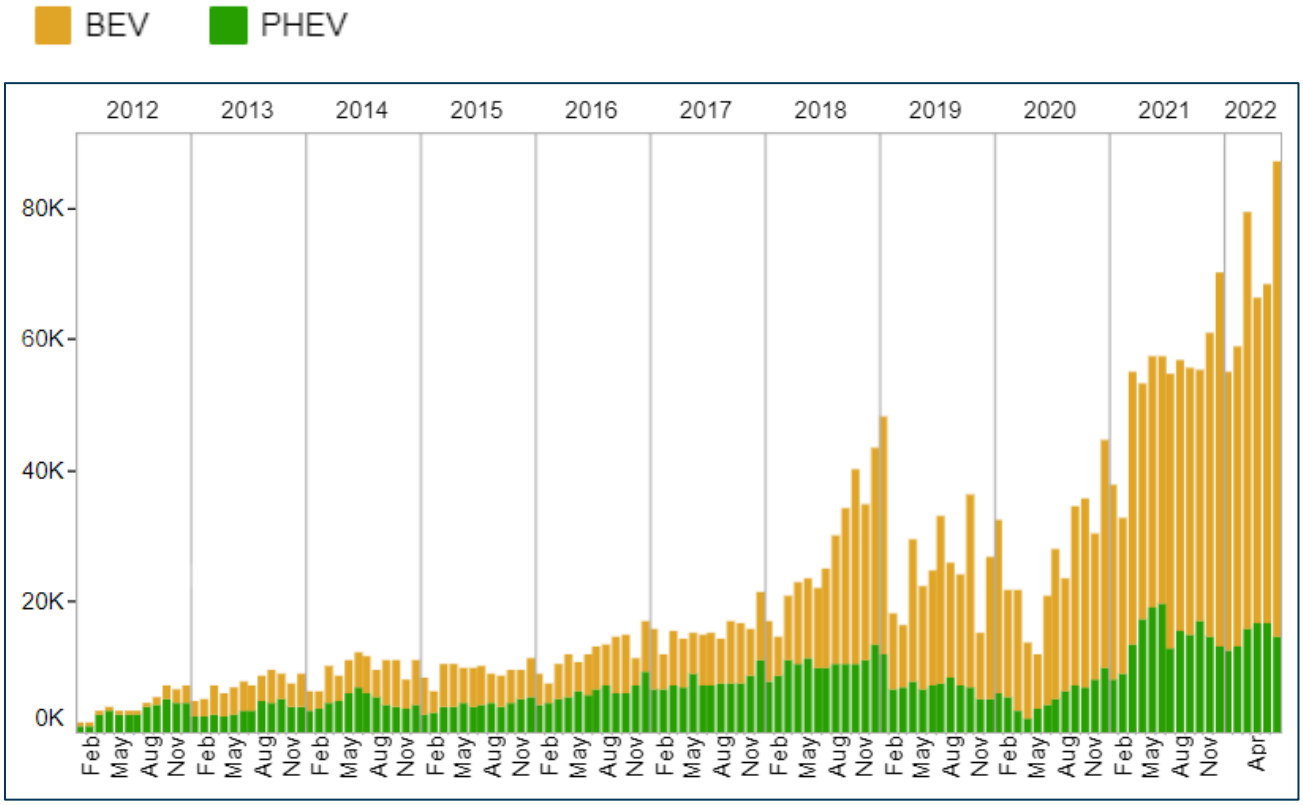


Figure 3: Monthly Battery Electric Vehicle (BEV) and Plug-in Hybrid Vehicle (PHEV) Sales in the United States, (Alliance for Automotive Innovation, 2022)

A strong foundation of public charging may be one reason for this high rate of EV adoption. Superior boasts multiple publicly accessible charging locations concentrated near US 36 and in the commercial area to the northwest. As of this writing, there are 19 level 2 stations dispersed throughout the Town (orange) and 21 level 3 (DC fast charging) ports (blue) (Figure 4). Most of the level 3 charging stations are located at the Tesla dealership.

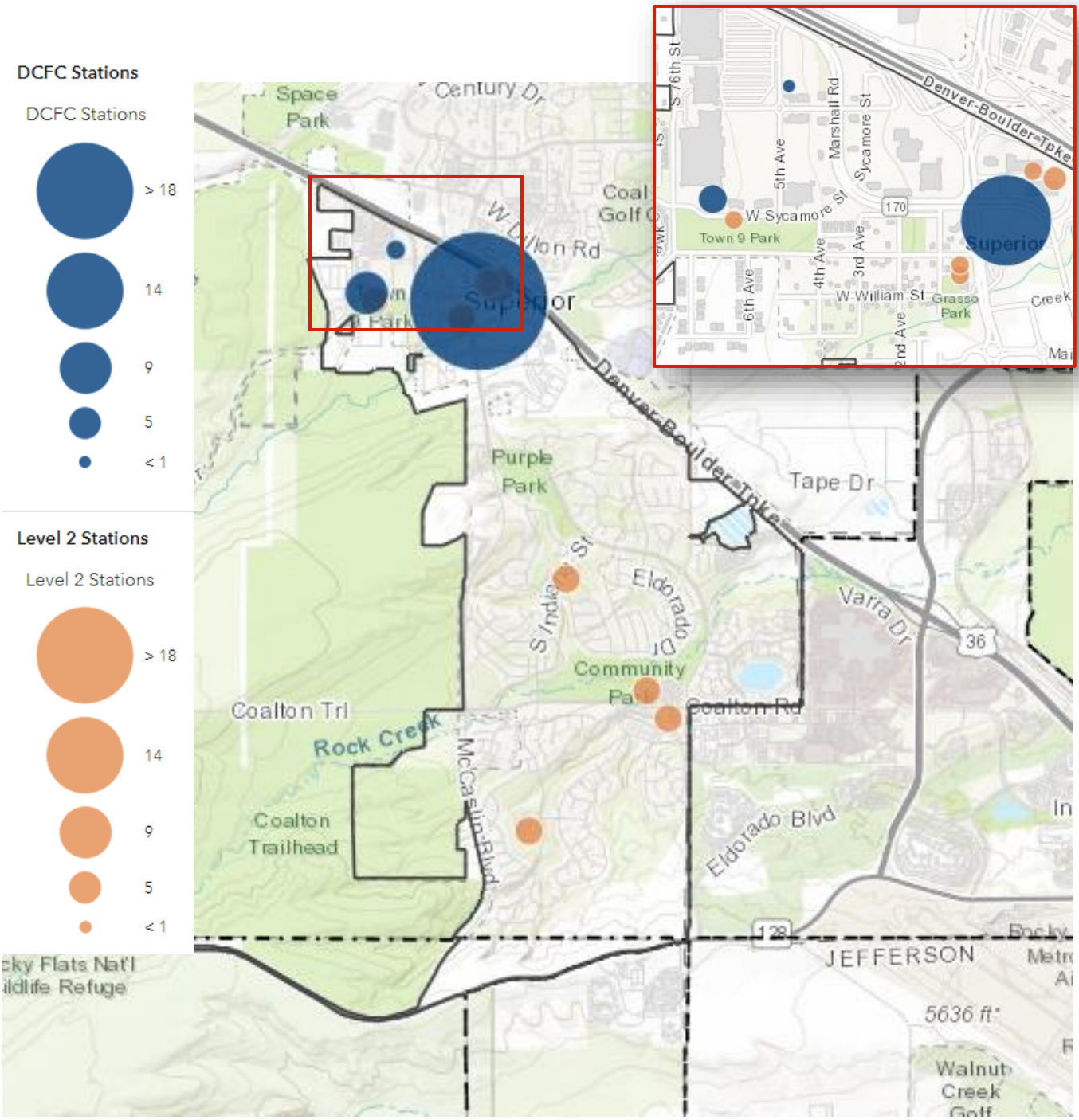


Figure 4. Public charging stations in Superior, with inset map of northwest commercial area.

Defining Charging Types

Level 1 Charging Station: Uses a standard 120-volt AC outlet and can take 8 to 12 hours to fully charge a depleted battery; intended for residential use only.

Level 2 Charging Station: Uses a 220-volt or 240-volt AC outlet and can fully charge a depleted battery in 4 to 6 hours; can be used in both residential and commercial settings.

Level 3/DC Fast Charging Station: Uses an industrial 480-volt DC outlet and can charge a battery to 80% in 20 to 30 minutes; used in commercial settings where the anticipated charge time is limited.

Bolstering our Resiliency to Energy Disruptions

As the effects of the climate crisis become more pronounced, natural disasters are likely to affect Superior with more frequency and intensity. Warmer, drier conditions have led to a year-round fire season along the Front Range, and the increased threat of wildfire is expected to be severe in Boulder County (Boulder OEM, 2022). The Marshall Fire is an acute reminder of the potential consequences of these conditions. Electrification, especially when paired with on-site generation and battery storage, can bolster resiliency to grid disruptions and temporary outages.

Other Drivers of Electrification

There are many other drivers that make beneficial electrification an attractive option, many of which are qualitative and therefore harder to measure. For building electrification, these include eliminating the potential for carbon monoxide leaks or explosions, reducing indoor air pollution (and the subsequent potential negative health effects), and others. For transportation electrification, these may include reducing noise pollution, improving local air quality, reduced maintenance needs, and increased torque. In Colorado, air pollution from burning fuels in buildings led to an estimated 181 early deaths and $2 billion in health impacts in 2017 (RMI, 2021).

Relevant Planning Initiatives

The Town of Superior has been involved in many energy initiatives over the past few years. A timeline of major initiatives can be found below (Figure 5).

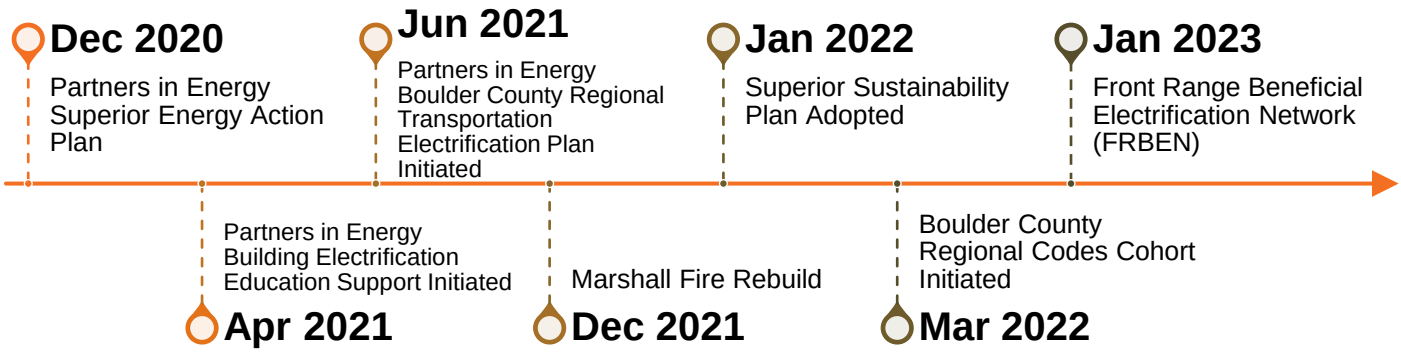


Figure 5. Planning initiatives related to beneficial electrification in Superior

In 2020, Superior finalized its Energy Action Plan, focusing primarily on promoting energy efficiency and renewable energy in homes, businesses, and Town facilities. Following 18 months of implementation, Superior saw:

- 1000% increase in home energy assessments
- 33% increase in HVAC program participation
- 50% increase in residential renewable energy program participation
- 900% increase in commercial renewable energy program participation

The Town completed an energy assessment of six facilities and subscribed 100% of municipal energy use to Windsource® - a renewable energy subscription program. Since the adoption of that plan, Superior has continued to be a regional leader in energy sustainability, participating in multiple regional energy efforts, adopting its first Sustainability Plan, and piloting this integrated Beneficial Electrification Plan.

Superior's Resilient Response to the Marshall Fire

In December of 2021, hundreds of Superior homes, several businesses, and two lives were lost in the Marshall Fire. With support from federal, state, utility, and local partners, Superior began the slow process of recovering and rebuilding. A Resilient Rebuild committee was formed, focusing on connecting residents with essential information and resources to support the reconstruction of homes. A critical function of this committee is to support the construction of energy efficient homes. Though Superior residents were provided the option of complying with 2018 International Energy Conservation Code (IECC) standards, as of February 2023, over 70% of initial permits indicated an intention to comply with Superior's newly adopted 2021 IECC energy codes (including solar ready, EV ready, and electric-preferred requirements). This indicates Superior's commitment to resilience and excellence, even in the face of adversity.

While the strategies in this plan are intended to operate externally from the Marshall Fire rebuild, we hope to build on the momentum and commitment to all-electric new development in Superior.

OUR BENEFICIAL ELECTRIFICATION FUTURE

Superior's Beneficial Electrification Vision

A vision is the north star that guides plan development, and ultimately, implementation. It captures Superior's values and answers the question "where do we want to go?" As summarized in the introduction, Superior has already embarked on a number of different planning processes. Rather than create an entirely new vision, the Beneficial Electrification Action Team chose to align with the vision set forth in the Town's Sustainability Plan:

The Town of Superior aspires to be a leader in environmental sustainability and to unleash its full potential to eliminate greenhouse gas emissions from the community.

Measurable Goals to Evaluate Progress

As with the vision, the Beneficial Electrification Action Team chose to align with an existing goal established through the Sustainability Plan. The success of these implementation efforts will be measured against the Town's ability to:

"Reduce community-wide greenhouse gas emissions 25% below 2016 emissions by 2025" by advancing the adoption of electric building equipment and electric cars.

There are several additional relevant goals in both Superior's Sustainability Plan and the Boulder County Regional Transportation Electrification Plan (BCRTEP). In addition to making progress toward GHG reduction, implementation of this plan will seek to make progress toward the goals summarized in Table 1.

Table 1. Summary of relevant goals from Superior Sustainability Plan and Boulder County Regional Transportation Electrification Plan

Plan	Goal
Superior's Sustainability Plan	Reduce [residential] electricity use by 2% annually and natural gas consumption by 2% annually through 2030.
	Achieve 90% of residential electric needs from carbon-free sources by 2030.
	Reduce combined [commercial] electricity and natural gas use by 3% annually through 2030.
Boulder County Regional Transportation Plan	Transition 30% of all vehicles registered in Boulder County to zero-emissions by 2030.
	By 2030, install a combined 2,380 public level 2 and DC fast charging ports equitably distributed across Boulder County.

HOW WE GET THERE

Opportunities for Electrification

To identify the best strategies to help Superior achieve its vision and goals, the team explored key baseline conditions, to identify areas of opportunity. The following sections summarize the key areas of opportunity for advancing electrification in Superior.

Superior's Residential Sector is Well Suited for Electrification.

Superior is home to approximately 13,000 residents and 4,700 households. The majority of homes are single family (66%) and owner-occupied (62%). Superior's median household income is also relatively high compared to the state's. Finally, more than 70% of residents own two or more vehicles (U.S. Census Bureau, 2021).

Additionally, over a quarter of households report using electricity for heating fuel (U.S. Census Bureau, 2021). Given the age of the housing stock, this is likely older and less efficient electric resistance heating systems rather than the more efficient heat pumps systems recommended in this plan. Upgrading existing electric heating systems can be more cost-effective than replacing natural gas with electric systems.

Increasing Multifamily Charging Access, Regionally

Superior has a growing segment of residents living in multifamily units, where convenient access to charging stations can be hard to find. The Boulder County Regional Transportation Electrification Plan identified multifamily charging access as a high priority for implementation. The regional team developed a map to identify multifamily charging gaps in Boulder County. The team is now working to identify funding for charging stations to fill those gaps. Superior staff actively participate on the regional implementation team and will seek to address multifamily charging gaps in alignment with the regional effort.

Commercial Heating Offers High-Impact Opportunities for Electrification

While commercial use makes up a smaller portion of total energy use (22%), almost half of commercial energy use is natural gas (Figure 6). Additionally, average energy use per business is almost three times as much as the average energy use per residential home (Figure 7). This means an individual action taken by a business could have a much larger impact than an individual action taken by a single resident.

Commercial natural gas use is estimated to be 55% space heating, 28% cooking, and 15% water heating (EIA, 2018). Therefore, the largest opportunity is through converting space heating systems to heat pump technologies, though both cooking and water heating also present excellent opportunities.

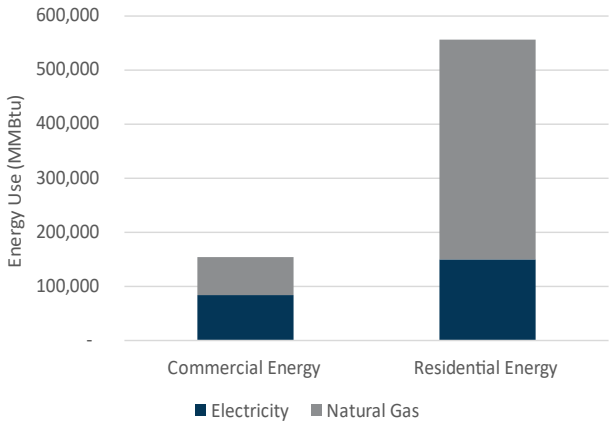


Figure 6. Energy Use Per Sector

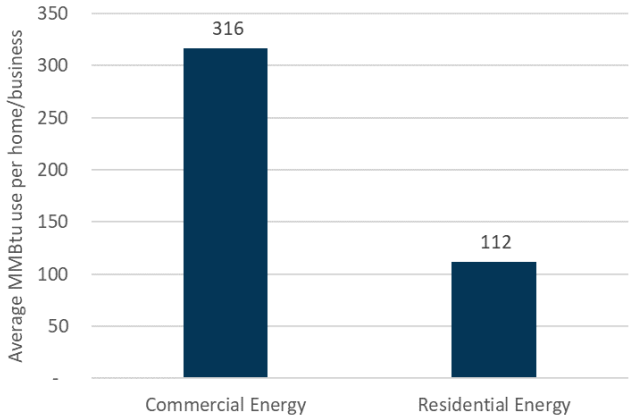


Figure 7. Energy Use Intensity Per Sector

Getting in on the Ground Floor

The sections above describe opportunities for electrifying existing properties, but what about energy for new development? Based on information shared by Superior's planning department, almost 2,300 new residential units are currently planned, 1,300 are entitled, and 800 are permitted at the time of this plan's writing. Superior is also expected to add over half a million gross square footage of commercial space between 2021 and 2030. Superior recently adopted 2021 IECC regulations, including the EV-ready, solar-ready, and electric-preferred appendices. Connecting developers with information and resources to support compliance with these codes, and available incentives and resources to help defray costs, can help accelerate Superior's transition to an electric future!

Leading by Example

Superior wants to lead the region in beneficial electrification and is already putting this commitment into action. On a recent redevelopment of the Town's Parks, Recreation, and Open Space Field House, the Town Board approved a 10% budget increase to support electrification measures. Additionally, the town has already electrified two vehicles, and is piloting the electrification of specialty equipment such as a paint striper, water meter, and buggy.

The Town's fleet and facilities present several additional opportunities for electrification. In 2022, the Town completed energy assessments of six facilities. These assessments revealed a few low-hanging fruit opportunities (e.g., LED replacement, addition of faucet aerators), and a few opportunities for major renovations (see Appendix B: Superior Facilities Assessment for detailed findings). Additionally, the Town is exploring opportunities to substantially expand the current Town Hall, which could present an opportunity for full or partial electrification.

Moving Us Toward Our Goals

Based on the opportunities identified above, the Beneficial Electrification Team identified the following three strategies to guide progress toward this plan's vision and goals:

- **Strategy 1:** Electrify Existing Properties
- **Strategy 2**: Support All-Electric New Development
- **Strategy 3**: Explore Electrification Opportunities for Town Fleet and Facilities

For strategies 1 and 3, targets were identified in alignment with the vision and goals of this plan. Strategy 2 will help make progress toward the targets in strategy 1. Achieving these will ensure that these strategies do their part to help Superior meet its GHG and electric vehicle (EV) goals. Realizing Superior's GHG reduction goal in its entirety will require advancing additional strategies in Superior's Sustainability Plan - such as increasing biking, walking, and transit - that are not addressed in this Beneficial Electrification Plan. The baseline for all Xcel Energy programs reflects a three-year average for 2019-2021. The baseline for all other metrics reflects a baseline of 2021.

Table 2. Superior Beneficial Electrification Plan Targets

Strategy	Metric	Baseline	Target (2023-2025)
Strategy 1	HVAC rebate participants	109	825
	Home charger and wiring participants	0	300
	Commercial EVSI participants	0	1
	Battery Electric Vehicles registered in Superior	275	625
Strategy 2	*This strategy will support progress toward targets in Strategy 1.*		
Strategy 3	Municipal electrifications projects	1	1
	Number of electric vehicles in Town fleet	2	TBD based on fleet analysis

Strategy 1: Electrify Existing Properties

Achieving our GHG reduction goals will require supporting electrification in the buildings that already exist. This includes actions to advance beneficial electrification in Superior's existing homes and businesses. Though electrification is most cost effective when considered at the time of development, there are still cost-effective opportunities to retrofit existing buildings with electric technology. This includes electrifying residential building equipment and installing electric vehicle charging infrastructure in both the residential and commercial sectors.

Targets

The baseline for all Xcel Energy programs reflects a three-year average for 2019-2021. The baseline for all other metrics reflects a baseline of 2021.

Metric	Baseline	Target (2023-2025)
HVAC rebate participants	*109*	*825*
Home charger and wiring participants	*0*	*300*
Commercial EVSI participants	*0*	*1*
Battery Electric Vehicles registered in Superior	275	625

Strategy Work Plan

Roles and Responsibilities		
Town of Superior • Lead outreach to existing residents and businesses; encourage and support utilization of existing resources • Lead development of supplemental funding for electrification projects • Track results of outreach • Support research to identify opportunities for signage and enforcement at new and existing EV charging locations	**Partners in Energy** • Coordinate development of outreach plan • Create marketing materials • Identify funding opportunities to support commercial EV charging • Lead research to identify opportunities for signage and enforcement at new and existing EV charging locations	**ACES/Others** • Inform outreach plan, including key channels and messaging • Brixmore to support exploration of EV charging opportunities near Whole Foods

Key Implementation Steps and Timeline			
Action Steps		**Description**	**Timeline**
1.	Explore opportunities for additional	Identify potential funding and delivery mechanisms to connect residents with supplementary funding to support electrification projects.	Q3 2023-Q4-2024

	electrification incentives		
2.	Conduct an outreach campaign to encourage adoption of electric technology	Develop and implement a comprehensive outreach plan to educate community members about the benefits and incentives to support adoption of electric heat pumps, electric cooking equipment, electric vehicles, and EV charging. Educational outreach will also highlight efforts by case studies/testimonials on building and vehicle beneficial electrification.	Q4 2023-Q4 2024
3.	Explore opportunity for EV charging near Whole foods (along with other commercial opportunities)	This action seeks to install one more charging opportunity in Superior Marketplace to ensure complete access to EV charging for all visitors.	Q1 2024

Implementation Considerations

- **Integration** – Outreach should focus on encouraging a holistic approach to beneficial electrification, starting with efficiency first and encouraging electrification across all systems, including heating loads and vehicles. Renewable energy generation and storage should also be encouraged, to help accelerate progress toward goals and to improve resiliency. As advanced metering becomes available in Superior, encouraging residents to run electric-powered equipment during off-peak hours can help reduce operational costs.
- **Coordination with Xcel Energy** – Electrifying multiple building systems and adding EV charging load may require upgrades to supply infrastructure to ensure sufficient capacity. This could include minor upgrades such as panel upgrades, or larger upgrades to the grid. Additionally, installing renewable technology requires interconnection to the grid. These factors emphasize the importance of remaining in close coordination with Xcel Energy to residents and businesses do not encounter unexpected costs or impacts.
- **Equity** – Outreach should be conducted to target diverse groups across Superior and developed to meet the individual needs of those groups as feasible. This may include specific focus on additional funding availability for low- and moderate-income residents, materials translation, or alternate outreach mediums.
- **Affordability** – Beyond the equity considerations above, all outreach should attempt to connect residents with all relevant funding sources to help maximize affordability.
- **Technology** – Many residents lack up-to-date knowledge on the efficiency and efficacy of cold climate heat pumps at lower temperatures. Addressing this concern will be a priority to best maximize uptake.

- **Outreach Fatigue** – Rather than inundating the community with information in a short time period, our strategy will be to provide a varied approach to engagement over a long time period.
- **Resonating with Residents** – Providing residents with opportunities to interact with technology can help deepen interest, as can appealing to values related to renovation, restoration, and innovation.

Regional Plan Linkages

- *Boulder County Regional Transportation Electrification Plan*
  - *CA-1: Regional Community Outreach*
  - *CA-2: Residential EV Purchasing Incentives*
- *Front Range Beneficial Electrification Network*
  - *Standardized Information Focus Group*
  - *Group Buy Focus Group*

Funding Considerations

Potential 2024 Budget Requests

- $5,000 to support Home Energy Squad Plus visits for residents
- Stacking rebates to further incentivize residential electrification measures

Potential Programs, Funding, and Incentives

- Xcel Energy Demand Side Management (DSM) Programs
  - Home Energy Squad
  - Insulation and Air Sealing
  - HVAC Heat Pump Rebates
  - Water Heater Heat Pump Rebates
- Xcel Energy Renewable Energy Programs
  - Net Metering
  - Solar*Rewards
  - Battery*Connect
- Xcel Energy Residential Electric Vehicle Programs
  - Charger and Wiring Rebate
  - EV Accelerate at Home
  - Optimize Your Charge
  - EV Purchase/Lease Rebate (income-qualified)
  - EV Network Dealers
- Xcel Energy Commercial Electric Vehicle Programs
  - EV Supply Infrastructure Program
  - Charger Service
  - Critical Peak Pricing Program
- Federal Incentives
  - Energy Efficient Home Improvement Credit 25C
  - HOMES Program
  - High-Efficiency Electric Home Rebate Program
  - EV, Commercial Clean Vehicle, and EV Infrastructure Tax Credits
  - Charging and Fueling Infrastructure (CFI) Discretionary Grant Program

    - EV, Commercial Clean Vehicle, and EV Infrastructure Tax Credits
- State Incentives
    - Colorado EV Tax Credit
    - Charge Ahead Colorado
    - E-Mobility Education and Awareness

Strategy 2: Support All-Electric New Development

New development presents a significant opportunity to advance Superior's beneficial electrification objectives, in both the residential and commercial sector. This planning process illuminated a need for education and outreach targeting Town staff, contracted building officials, the development community, and homeowners. Outreach will include strong, consistent messaging around cost and maintenance comparisons, rebate and incentive information, and technology options (e.g., cold climate heat pumps). Though much of the development anticipated by 2025 has already been entitled or permitted, there are still opportunities for developers and residents to leverage incentives to support more efficient, and in some cases, electric development. Workforce development was also identified as a critical need, and there is an excellent opportunity to leverage regional workforce development efforts, led by the Front Range Beneficial Electrification Network.

Targets

No targets were set specifically for Strategy 2. The efforts associated with this strategy aim to increase the amount of electric equipment installed by both developers and new homeowners and will be captured through participation in Xcel Energy's HVAC-R program outlined under Strategy 1.

Strategy Work Plan

<table>
<tr><th colspan="3">Roles and Responsibilities</th><th></th></tr>
<tr><td colspan="2">Town of Superior
Connect developers with relevant resources at all applicable points in development review process
Connect new homeowners with resources to support investment in beneficial electrification
Leverage FRBEN and Boulder County EV implementation to support workforce development and outreach</td><td>Partners in Energy
Explore opportunities to support regional efforts, building on experiences in other communities
Share relevant Xcel Energy new development program information and case studies
Draft beneficial electrification-focused development review comment
Host a new development program training for staff
Develop flyer to share with developers and new homeowners highlighting relevant beneficial electrification resources</td><td>ACES/Others
Provide input on areas for improvement and further integration with Town goals throughout implementation</td></tr>
<tr><th colspan="3">Key Implementation Steps and Timeline</th><th></th></tr>
<tr><th colspan="2">Action Steps</th><th></th><th>Timeline</th></tr>
<tr><td>1.</td><td>Developer and New Homeowner</td><td>Implement outreach and education embedded into existing</td><td>Q1 2024-Q4 2024</td></tr>
</table>

	Education and Outreach	development processes to communicate code updates, rebates and incentives, and benefits related to electrification in new development	
2.	Workforce Development	Coordinate with regional efforts stemming from the Boulder County Transportation Electrification Plan and FRBEN to promote further workforce development opportunities in Superior, whether leveraging existing efforts or hosting lunch-and-learns	Q2 2024-Q4 2024

Implementation Considerations

- **Integration** – Superior's new codes support a holistic approach to beneficial electrification. Developers who prioritize efficiency and consider the integration of rooftop solar with electric heating and electric vehicle infrastructure can right size electric supply infrastructure and potentially save on construction costs.
- **Affordability** – All outreach should attempt to connect developers with all relevant funding sources to help maximize affordability.
- **Technology** – Many developers lack up-to-date knowledge on the efficiency and efficacy of cold climate heat pumps at lower temperatures. Addressing this concern will be a priority to best maximize uptake.
- **Outreach Fatigue** – Lessons learned from past outreach in Superior let the Town know that too-frequent outreach leads to disinterest and disengagement. Staggering outreach through different groups or mediums will help alleviate this issue.
- **Timing** – Timing also matters, especially regarding workforce development, where attendees are less busy during cold weather and are incentivized to attend trainings by being offered catered lunches. Finally, waiting to pursue workforce development may allow for better alignment with regional workforce activities being led by FRBEN.

Regional Plan Linkages

- *Boulder County Regional Transportation Electrification Plan*
  - *Short Term Strategy CA-1: Regional Community Outreach*
  - *Short Term Strategy CA-2: Residential EV Purchasing Incentives*
  - *Short Term Strategy CA-4: EV Workforce Pipeline and Training*
- *Front Range Beneficial Electrification Network (FRBEN)*
  - *Workforce Development Focus Group*

Funding Considerations

Potential 2024 Budget Requests

- Funding to host potential trainings of workforce or other in-person events

Potential Programs, Funding, and Incentives

- Xcel Energy Demand Side Management (DSM) Programs
  - Insulation and Air Sealing

    - HVAC Heat Pump Rebates
    - Water Heater Heat Pump Rebates
    - ENERGY STAR New Homes
    - Energy Efficient Buildings
    - Energy Design Assistance
- Xcel Energy Renewable Energy Programs
    - Net Metering
    - Solar*Rewards
- Xcel Energy Commercial Electric Vehicle Programs
    - New Construction Rebate
    - Income-Qualified Rebate
    - EV Supply Infrastructure Program
    - Charger Service
    - Critical Peak Pricing Program
- Other Xcel Energy Programs
    - Codes and Standards support
- Federal Incentives
    - Rebuilding American Infrastructure with Sustainability and Equity
    - Charging and Fueling Infrastructure (CFI) Discretionary Grant Program
- State Incentives
    - Charge Ahead Colorado
    - ZEV Workforce Development Grant
    - I-Codes Technical Assistance

Strategy 3: Explore Electrification Opportunities for Town Fleet and Facilities

The Town of Superior wants to be an innovator and regional leader, demonstrating the pathway toward beneficial electrification. Already, the Town has seized opportunities to electrify its fleet and facilities; the strategies in this section highlight opportunities to build on those existing efforts. The target identified for this strategy indicates electrification of one or more building systems (e.g., HVAC, boiler).

Targets

The baseline for the following metrics reflects a baseline of 2021.

Metric	Baseline	Target (2023-2025)
Municipal electrifications projects	1	1
Number of electric vehicles in Town fleet	2	TBD based on fleet analysis

Strategy Work Plan

Roles and Responsibilities		
Town of Superior • Connect with peer communities as needed • Lead regional ride and drive for municipal leadership and staff • Lead participation in Fleet Electrification Advisory Program • Continue facilities planning activities to inform potential electrification opportunities	**Partners in Energy** • Support identification of peer communities with electrification experience • Support organization of regional ride and drive for municipal leadership and staff • Connect Town staff with Fleet Electrification Advisory Program • Share information and funding opportunities to support facility electrification projects	**ACES/Others** • FRBEN Standardized Information Working Group – lead peer community research and develop standardized information related to electrification

Key Implementation Steps and Timeline			
Action Steps		**Description**	**Timeline**
1.	Cultivate and Engage in peer learning opportunities	Identifying or cultivating peer learning opportunities, to gain insight from communities that have had the benefit of testing electric fleet and facility equipment	Q3 2023-Q4 2023
2.	Develop an integrated electric vehicle	Participate in the Fleet Electrification Advisory Program (FEAP) to outline an approach for drafting a comprehensive	Q4 2023-Q4 2024

	replacement and charging infrastructure plan	vehicle replacement plan to guide the electrification of Superior's fleet, including suitable vehicles, charging infrastructure, and charging management needs. Importantly this action will include identifying state, utility, and federal funding sources that can support the implementation of this plan	
3.	Explore opportunities to electrify new and existing facilities	Identify one or more building electrification pilot projects to demonstrate innovation and regional leadership	Q3 2023-Q4 2024

Implementation Considerations

- The Town of Superior has a small fleet with little duplication of assets. It is paramount that Superior ensure technologies are tried, tested, and successful before adopting them into Town fleet and facilities.
- Every Internal Combustion Engine (ICE) vehicle procured today represents a 5- to 10-year delay in achieving full fleet electrification. Given constrained budgets, Superior often seeks to stretch the useful life of vehicles, which can further extend that delay. This means that to achieve this goal, any vehicle replaced between 2023-2030 must be replaced with an electric model.
- The Town completed energy assessments on six town facilities. Several assessments identified opportunities to replace gas-powered equipment with electric equipment (see Appendix B: Superior Facility Energy Audit Recommendations).
- The Town has explored electrification opportunities in the past, but projects have not proven cost effective. For instance, Superior explored the feasibility of installing a backup battery system to serve the water treatment plant, but the cost was 10 times greater than the diesel/gas generator option.
- The Town of Superior operates from several locations - some Town-owned and some leased. The Town is currently exploring opportunities to add to the existing Town Hall to reduce leasing requirements. A significant remodel or rebuild could present an opportunity for electrification.

Regional Plan Linkages

- *Boulder County Regional Transportation Electrification Plan*
  - *The Boulder County Regional Transportation Plan has brought together many of Superior's peer communities, with many embarking on a similar journey. These communities can share their successes to help other communities maximize success on their own journies.*
- *Front Range Beneficial Electrification Network*
  - *Funding Focus Group*

Funding Considerations

Potential 2024 Budget Requests

- Funding to execute integrated electric fleet and charging plan
- Funding for at least one building electrification pilot project

Potential Programs, Funding, and Incentives

- Xcel Energy Demand Side Management (DSM) Programs
  - Insulation and Air Sealing
  - Energy Efficient Buildings
  - Energy Design Assistance
- Xcel Energy Renewable Energy Programs
  - Net Metering
  - Solar*Rewards
- Xcel Energy Commercial Electric Vehicle Programs
  - EV Supply Infrastructure Program
  - Charger Service
  - Critical Peak Pricing Program
  - Income-Qualified Rebate
- Federal Incentives
  - Clean Heavy-Duty Vehicle Grants and Rebates
  - Diesel Emissions Reduction
  - Low or No Emission Vehicle Program
  - Rebuilding American Infrastructure with Sustainability and Equity
  - EV, Commercial Clean Vehicle, and EV Infrastructure Tax Credits
  - Charging and Fueling Infrastructure (CFI) Discretionary Grant Program
- State Incentives
  - Colorado EV Tax Credit
  - Charge Ahead Colorado
  - Clean Fleet Enterprise Clean Vehicle and Technology Grant Program

HOW WE STAY ON COURSE

Successfully implementing plan strategies and achieving plan goals will require close coordination between the Town and its partners, along with regular tracking and reporting to ensure that it stays on course. Implementation of the plan will be divided into two main roles as described in Figure 8.

Project Management Team

Participants: Town's Sustainability Coordinator, Sustainability Analyst, and ACES representative; Partners in Energy community facilitators; and Xcel Energy staff

Responsibilities: Coordinating strategy implementation and tracking progress toward goals

Meetings: Monthly

Beneficial Electrification Action Team

Participants: Project Management Team and interested members of Beneficial Electrification Action Team (see Acknowledgements); additional members may be identified through implementation

Responsibilities: Implementing strategies and sharing unique perspectives and resources with the team

Meetings: Quarterly or as needed

Figure 8: Implementation Team

Table 3 illustrates an anticipated timeline for the EV Action Team to implement plan strategies.

Table 3. Action implementation timeline

Strategy	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024
Action EE-1: Explore opportunities for additional electrification incentives						
Action EE-2: Conduct an outreach campaign to encourage adoption of electric technology						
Action EE-3: Explore opportunity for EV charging near Whole foods (along with other commercial opportunities)						
Action ND-1: Developer education and outreach						
Action ND-2: Workforce development						
Action LE-1: Cultivate and engage in peer learning opportunities						
Action LE-2: Develop an electric vehicle replacement plan						
Action LE-3: Explore opportunities to electrify new and existing facilities						

Tracking Progress

The Project Management Team will track and report metrics for plan goals and targets on a biannual basis (Table 4 and Table 5)**.** The results will be used by the Project Management Team and Beneficial Electrification Action Team to understand the impact of strategy implementation and adjust course as necessary. These results will also be shared with the Town Board and the wider community to provide transparency about the implementation process and recognize the collaborative efforts of those involved.

Table 4: Goal Metrics

Goal	Data Source
Reduce community-wide greenhouse gas emissions 25% below 2016 emissions by 2025	Boulder County
30% of light-duty vehicles registered in Superior will be battery electric vehicles by 2030	Boulder County

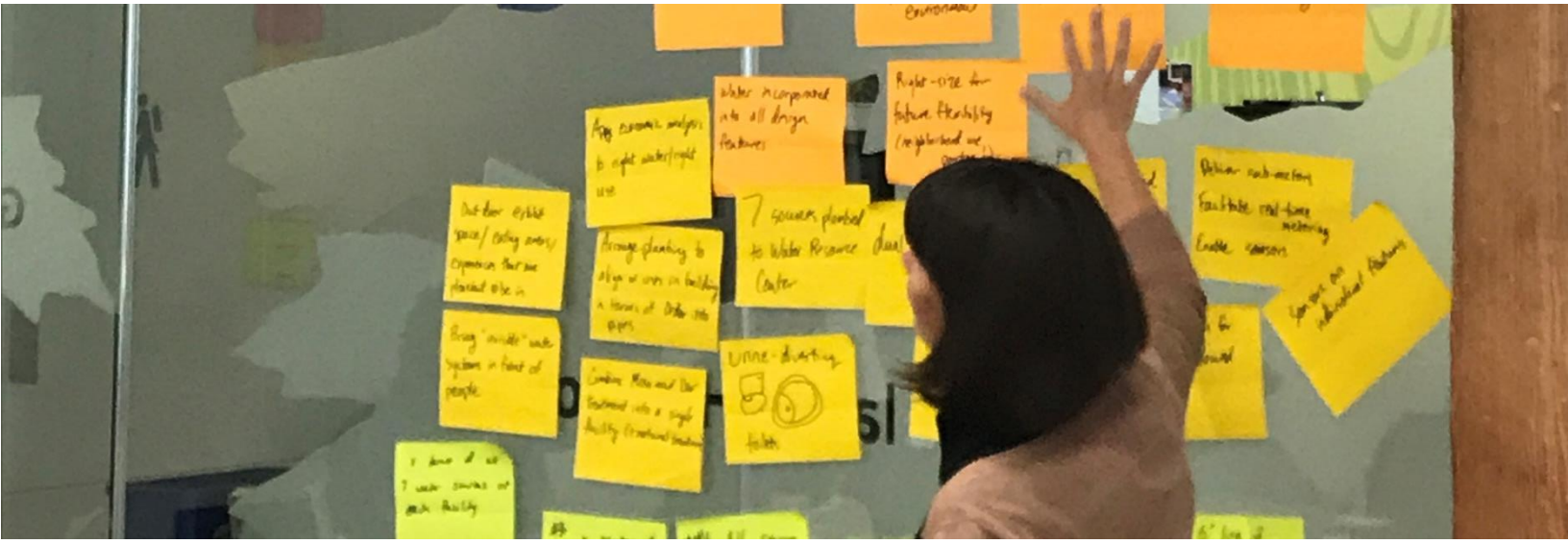
Table 5: Target Metrics

Metric	Data Source
Strategy 1: Electrify Existing Properties	
Participants in Xcel Energy HVAC-R programs	Partners in Energy Data
Participants in Xcel Energy Home Charger and Wiring Rebates	Partners in Energy Data
Participants in Xcel Energy EVSI Rebates	Partners in Energy Data
BEVs registered in Superior	Boulder County DMV
Strategy 3: Explore Electrification Opportunities for Town Fleet and Facilities	
Municipal electrifications projects	Town of Superior
Number of electric vehicles in Town fleet	Town of Superior

Adapting to a Changing Landscape

An effective plan is cyclical in nature; the strategies in this plan involve rapidly changing technologies and industry standards. It will be important that strategies are evaluated and updated throughout implementation to reflect advancements and new offerings from the transportation industry, Xcel Energy, and state and federal resources. The Xcel Energy Partners in Energy EV Toolkit can be a good resource for identifying new strategies to address unexpected barriers that may arise. Any adjustments will be documented and shared with the broader group and community as they occur.

APPENDIX A: DRIVERS OF ELECTRIFICATION



General Drivers of Electrification

To inform motivations and opportunities for electrification in Superior, Partners in Energy collected baseline data about existing trends and conditions. While some of these trends are summarized in the main plan, the sections below provide additional detail that may support implementation efforts.

Reducing Greenhouse Gas (GHG) Emissions

Beneficial electrification reduces greenhouse gas emissions in two ways:

1) Accessing renewable energy and
2) Energy efficiency improvements

The Town of Superior utilizes both natural gas and electricity for energy use in buildings, and gasoline, diesel, and electricity in the transportation sector. Natural gas, gasoline, and diesel are 100% fossil fuels; electricity is more complicated. The current electricity mix is outlined in (Figure 9).

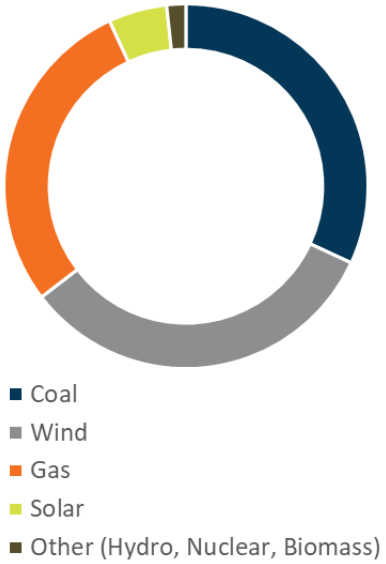


Figure 9. Xcel Energy Electric Grid Mix 2023

Today, about 60% of Superior's electricity comes from fossil fuels (coal and gas), but this proportion is decreasing rapidly as Xcel Energy works to meet their clean energy commitments. Xcel Energy has a goal to reduce carbon emission by nearly 85% by 2030 compared to 2005 levels, and to provide 100% carbon-free electricity by 2050.

Transitioning to electricity leverages the 40% clean electricity sources powering the grid today, as well as the additional renewables up to 80% within the next decade. This transition can be expressed through the decrease in fossil fuel use as outlined in Figure 10, assuming immediate electrification covers all natural gas, gasoline, and diesel use (or other fossil fuel end uses such as propane).

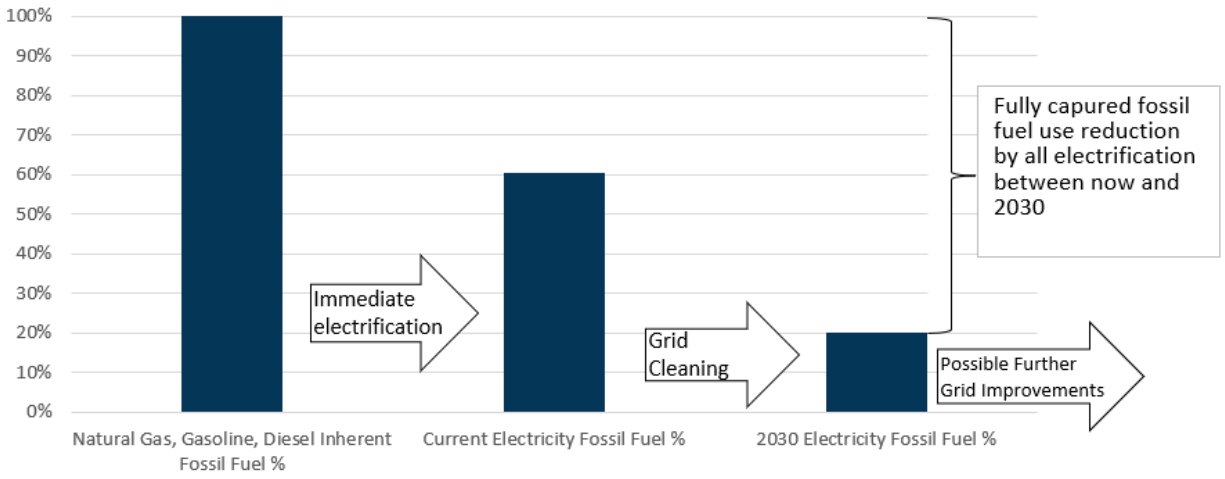


Figure 10. Fossil Fuel Use Percentage Over Time Through electrification

This transition results in a decrease in emissions. The emissions factor (how many metric tons of CO_2 equivalent are released when consuming a unit (1 MMBtu) of energy) is shown below. Electricity becomes cleaner on a per-unit basis in 2029 (Figure 11).

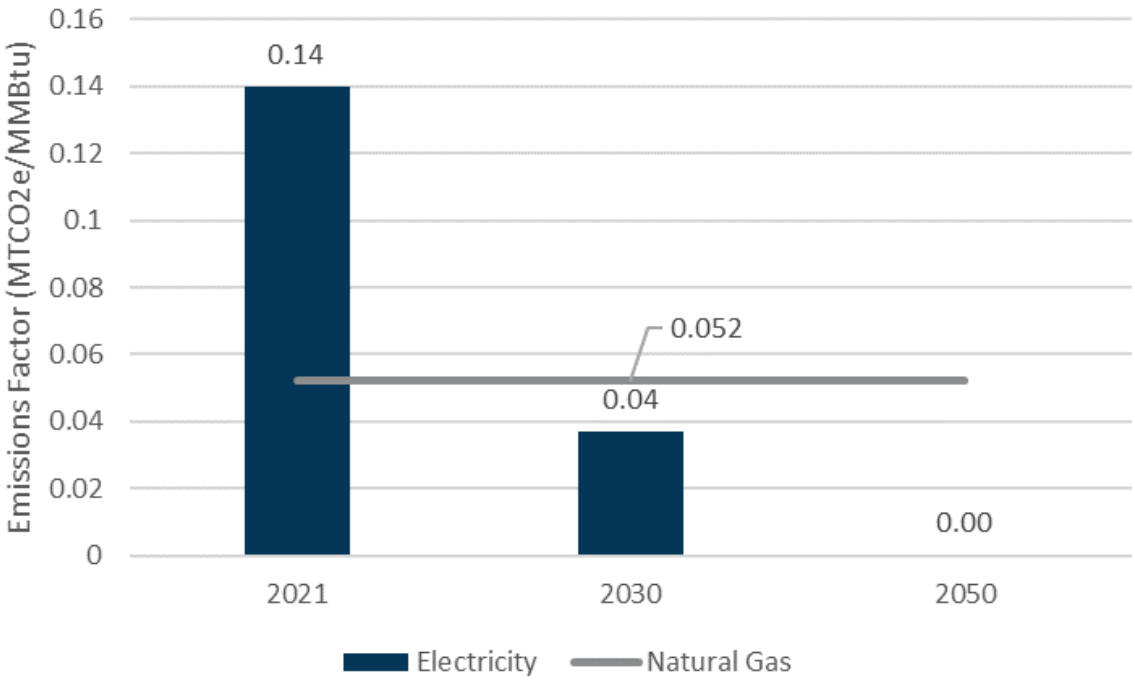


Figure 11. Projected Emissions Factor of Xcel Energy's Electricity and Natural Gas

Note that the above graph does not include efficiency improvements or other benefits that would push the effective emissions equivalence to an earlier date.

Electric technology is also more energy efficient than its gas counterparts. Air source heat pumps used to heat buildings are found to be over **three times as efficient** as highly efficient gas furnaces for heating in Colorado's climate (Figure 12) (RMI, 2022).

In the transportation sector, electric vehicles are found to be vastly more efficient compared to conventional gas powered vehicles. Electric vehicle batteries convert 59-62% of energy into vehicle movement, while gas powered vehicles only convert 17%-21% (Energy Sage, 2022). In terms of total energy conversion, that's approximately a **40% increase, or three times the original efficiency**. A similar or better increase has also been found for electric trucks and busses (California Air Resources Board, 2018).

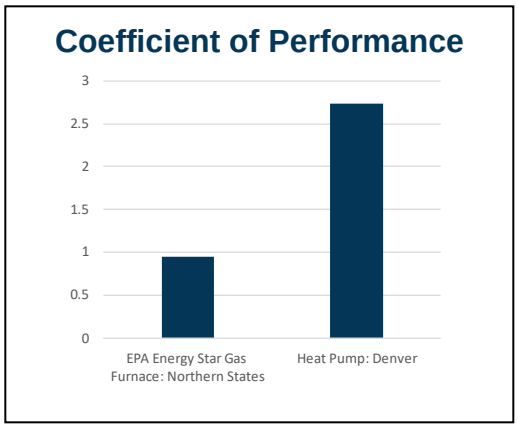


Figure 12. Heat pumps can be more efficient than high-efficiency gas furnaces.

Saving on Operational Costs

Electrification can have differing cost implications depending on the cost and amount of the fuel being replaced, compared to the cost and amount of electricity. For instance, implementing electric heat pumps in single family homes is often cost effective for new development (Southwest Energy Efficiency Project, Colorado Energy Office, 2022; Group14 Engineering, 2020; RMI, 2022). After factoring in available rebates from the federal Inflation Reduction Act (IRA), Xcel Energy's rebate programs, and potential Colorado rebates as currently proposed, it is even more likely to be a cost benefit to electrify, even in retrofit scenarios. Many of the rebates available have higher values for income-qualified residents, which further help making building electrification affordable. However, implementing electric heat pumps in large commercial spaces may require a cost premium.

The first cost and operational costs also vary. While light-duty passenger electric vehicles tend to cost more at point of sale, electric vehicles boast a 50% lower total cost of ownership compared to gas-powered vehicles (Forbes, 2018). Electrification also cushions users from volatile energy prices - especially for gasoline and diesel in the transportation sector, and natural gas in the buildings sector (Figure 13). Xcel Energy has an established goal of making it possible to drive an EV for the equivalent of $1 or less per gallon of gasoline.

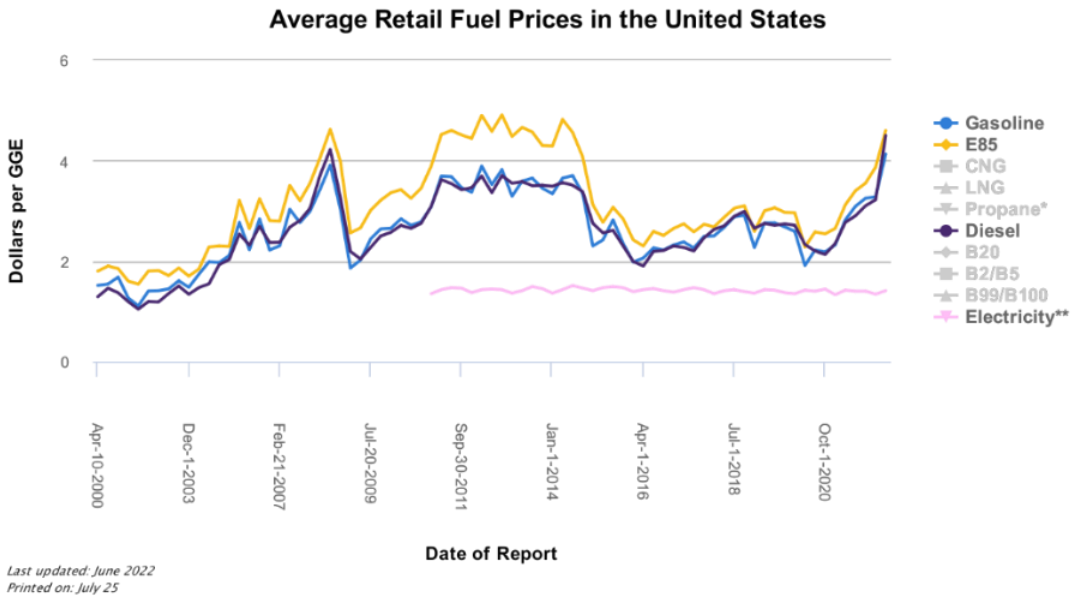


Figure 13. Average Retail Fuel Prices in the United States for Gasoline, E85, Diesel, and Electricity.

Residential Drivers of Electrification

There is a major opportunity to reduce GHG emissions through residential retrofits.

In Superior, residents use the lion's share of total energy (78%), with almost three-quarters of that energy use coming from natural gas. This means that approximately 57% of Superior's total energy use (including homes, businesses, and municipal operations) is attributed to residential natural gas use. In existing owner-occupied homes, the vast majority of natural gas and propane use are for space and water heating, with cooking making up most of the rest (Figure 14).

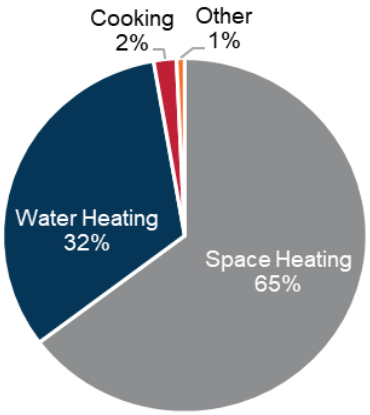


Figure 14. Residential Fuel by End Use, 2015 EIA Residential Energy Consumption Survey (RECS) Table CE5.2 (EIA, 2018).

Electrifying homes can be cost effective.

All three of these end uses are easily electrified. Space heating, representing the majority of residential fuel use, has been found (for new construction in Colorado) to cost anywhere from $0 (Group14 Engineering, 2020) to $3,200 (Southwest Energy Efficiency Project, Colorado Energy Office, 2022) more to fully electrify for a fully centralized system on a first-cost basis. Other studies found that it may be up to $6,500 cheaper to electrify using a ductless mini-split system, even with a gas backup (City of Denver, Lotus, 2021). Operating costs likewise vary significantly in various studies. These same two studies cite anywhere from an $82-350 per year increase to electrify.

For water heating, these same two studies cite a $700-900 first-cost increase, with operational cost savings of $33 per year according to SWEEP.

Factoring in Xcel Energy rebates or other program savings not already factored in by these studies, as well as taking advantage of the new federal funding under the Inflation Reduction Act, provides a theoretical maximum rebate for income qualified individuals of **$11,750** for a heat pump water heater, and **$18,000** for heat pump HVAC (this does not consider project cost caps, income eligibility, or other limiting factors). Add to this any potential upcoming state rebates, and these rebates will easily overcome many cost premiums faced by owners in electrifying their homes; and, in the majority of cases is expected to make electrification less expensive than replacing with gas options. These dollars are also available at a reduced (but still substantial) amount for individuals who are not low-income.

Many of Superior home heating systems may be at end of life.

Nearly 90% of homes in Superior were built between 1990 and 2010; therefore, many of the heating systems in these homes are likely due for replacement, presenting an excellent opportunity to pursue electrification when homeowners update their HVAC systems (U.S. Census Bureau, 2021). Further, almost a quarter of Superior homes already use electricity for heating fuel, indicating an existing commitment to electrification.

Commercial Drivers of Electrification

Superior's commercial sector is relatively small, with a large number of chains.

Superior has a relatively small commercial sector, with very few owner-occupied businesses and a large number of national chains. Since property owners are crucial for decision-making related to building improvements, making progress in the business sector will require partnering with property owners and/or managers.

Commercial building electrification presents an opportunity for high impact across a small number of projects.

Over 22% of Superior's energy (associated with buildings) is used by the commercial sector, and 45% of that energy use is natural gas. This means that 10% of total community energy use is spent on commercial natural gas. Although this a relatively small proportion, commercial properties use 3 times more energy on a per unit basis compared to residential properties. This indicates an opportunity to make a large impact, even with a small number of beneficial electrification projects. Commercial building electrification's feasibility entirely depends on building specifics. Small offices or similar simple commercial buildings are typically the most common, easily electrified commercial spaces (Mascolino, 2023). Anecdotally, the larger the building, the more complex the HVAC system constraints, and the higher the heating/cooling loads, the less likely that electrification (at least of space heating) will be cost effective.

Fleet and Facilities Drivers of Electrification

Superior has already begun exploring opportunities to incorporate electrification into facility upgrades.

The Town of Superior operates from several locations, some Town-owned and some leased. Notably, the Town has considered consolidating by redeveloping the current Town hall to allow all administrative functions to operate from one location. When feasible, Superior is prioritizing opportunities to incorporate electrification elements into redevelopments. In 2022, the Parks and Open Space field house was due for a renovation and Superior enlisted Partners in Energy to recommend potential electrification elements in the Request for Proposal. The final project outcomes are summarized in Table 6.

Table 6. Parks and Open Space Field House Renovation Project Budget and Details

Parks and Open Space Field House Renovation	
Original project budget	$50,000
Electrification budget	$5,000
Efficiency Improvements	LED lamps, duct insulation, air conditioner
Electrification measures	HVAC and water heater
Future Improvements	EV charging infrastructure

The Town has explored additional electrification opportunities in the past, but projects have not proven cost effective. For instance, Superior explored the feasibility of installing a backup battery system to serve the water treatment plant, but the cost was 10 times greater than the diesel/gas generator option.

Superior has already piloted electrification of multiple fleet vehicles.

The Town of Superior has a relatively small fleet with little duplication of assets. Many vehicles are expected to perform multiple duties, such as hauling landscaping equipment or serving as a snowplow during winter storms. Within Superior's fleet, light-duty administrative vehicles present opportunities for electrification, and the Town already owns and operates two Tesla EVs, which are successfully used for administrative purposes.

Superior is currently piloting additional electric equipment such as a paint striper, water meter, and buggy. Fleet vehicles are charged at the Superior Town Hall charging station.

Superior has installed electric vehicle charging stations throughout town, that require a small fee to use, at the following locations:

- Community Park parking lot
- Superior Town Hall
- Founders Park, north side
- 100 Superior Plaza Way, near the former Old Chicago
- Superior Community Center

New Development Drivers of Electrification

Superior has a significant amount of new development on the horizon.

Based on information shared by Superior's planning department, almost 2,300 new residential units are currently planned, 1,300 are entitled, and 800 are permitted at the time of this plan's writing. Superior is also expected to add over half a million gross square footage of commercial space between 2021 and 2030. Though much of residential and commercial development has been entitled or permitted, there are still ample opportunities to connect developers and new homeowners with resources to support efficient, and in some cases, electric development.

The Town of Superior adopted new building codes that support beneficial electrification.

In accordance with Superior's Sustainability Plan, the Town adopted the 2021 International Energy Conservation Codes, applicable to all new commercial and residential development after March 28, 2022. Additionally, the Town adopted appendices defining solar-ready, EV-ready, and electric-preferred requirements. For more information, check out the Town of Superior 2021 IECC Amendments Fact Sheet. These codes apply to all new commercial and residential construction outside the Marshall Fire recovery area, and to residential properties that were destroyed in the Marshall Fire but are no longer owned by the record owner(s) of the property. All other residents and commercial properties rebuilding in the recovery area have the option to adhere to the 2018 IECC standards or to opt in to the 2021 IECC standards. As of February 2023, more than 70% of permit holders elected to opt-in to the 2021 IECC standards.

APPENDIX B: SUPERIOR FACILITY ENERGY AUDIT RECOMMENDATIONS

In 2021, the Town of Superior participated in Xcel Energy's Business Energy Assessments, receiving assessments for 6 facilities. The following table, provided by the Town of Superior and lightly edited for readability, summarizes the findings of these assessments, including key facility features, electrification opportunities, and efficiency improvement opportunities.

Property (linked to report)	***Facility Description***	**Unidentified Electrification Opportunities**	**Energy Use Intensity EUI**	**Identified Energy Efficiency Measures**
Community Center	*The Town of Superior Community Center is a 13,869 sq ft facility that was originally designed as a vehicle dealership in 1999 according to Boulder County Assessor records. The Town of Superior purchased this property in 2018 and converted it to a community center. Operating hours are 8:00 AM to 8:00 PM Monday through Thursday, 8:00 AM to 10:00 PM Friday/Saturday, and 12:00 PM to 6:00 PM Sunday. The primary heating and cooling for the building is supplied by a 10-ton rooftop unit (RTU) manufactured in 1998, an 8.5-ton RTU manufactured in 1998, and a 10-ton RTU manufactured in 2020. They are all controlled with programmable thermostats using unoccupied setbacks. The domestic hot water for the building is supplied by a 199,900 British Thermal Unit (BTU) condensing water heater manufactured in 2020.The bathroom faucets use WaterSense low flow (0.5 gallons per million (gpm)) aerators and are touchless. The interior lighting and exit signs are all LED. The recommended LED upgrades include both full fixture and bulb replacement strategies. The exterior lights are a mix of Compact Fluorescent Lighting (CFL) or High Intensity Diode (HID) fixtures, on a photocell to*	Water Heater (2020) 199.9 kBtu condensing. New - not an opportunity to replace very soon, but consider electrifying later. Rooftop units have natural gas backup and are due to be replaced. Consider 100% electric options.	75.2	Light emitting diode (LED) Lighting (exterior): Exterior - convert to LED HVAC Unit Replacement: Electric; primary heating and cooling are supplied by a 10-ton RTU manufactured in 1998, an 8.5-ton RTU manufactured in 1998, and a 10-ton RTU manufactured in 2020 - all controlled with programmable thermostats using unoccupied setbacks. Envelope Improvements: Several areas on the south and west perimeter of the building have summertime comfort complaints. The west offices and south meeting rooms do not have blinds to help manage solar gain in these rooms. Timer On Ventilation Fan: Manual control, add timer.

	limit operation to nighttime only. The ventilation for the bathrooms is supplied by one fractional horsepower fan that appears to have a manual control. This facility has a small commercial kitchen with medium- and low-temperature reach-in coolers. The pre-rinse spray valve (PRSV) is a water-efficient 1.1 gpm flow rate unit that saves both water and energy. Since hot water is commonly used for dish washing, reducing the amount of hot water used also reduces the amount of water that needs to be heated. Dishwashing is done with a low-temperature, chemical sanitization, undercounter dishwasher. The Town of Superior Community Center facility presently has an average yearly peak demand of 49 kW and consumes about 87,640kWh annually. The average annual cost of this energy is about $10,695. The facility presently consumes about 7,432 therms annually. The average annual cost of this energy is about $4,178. See "Facility Energy Use" section for more information on energy consumption.			
North Pool	*The Town of Superior North Pool is an outdoor pool facility with a 2,650 sq ft structure that houses a front desk, locker rooms, bathrooms, and mechanical spaces that contain the pool equipment. There is one main pool and one kid's pool. There are also tennis courts that appear to be on the same electrical service. Operating hours for the pool are 6:00 AM to 8:00 PM Monday through Friday, and 10:30 AM to 8:00 PM Friday and Saturday from Memorial Day through Labor Day. Operating hours for the tennis courts have a switch for on-demand operation and are only enabled between 6:00 PM and 10:00 PM. Heating for the building is supplied by both radiant and convective electric unit heaters. This facility only operates in the summer, and there is no cooling inside the building. Hot water for the main pool is supplied by a 1,250 kBTU non-condensing pool boiler manufactured in*	Pool boiler - non-condensing manufactured in 2016, so "new", but are there electric boiler replacement options? DHW - 199.9 kBtu condensing tank water heater manufactured in 2016. Go electric at end of life.	681	Faucet Aerators: The existing bathroom sinks were found to have standard efficiency aerators rated at 2.0 gpm flow rate. LED Lighting: Interior lighting is a mix of CFL and T8 fluorescent fixtures while the exterior lights are CFL. The tennis courts have a switch for on-demand operation and are only enabled between 6:00 PM and 10:00 PM. Since the tennis court lights are on-demand, precise annual operating hours could not be confirmed, so half of the maximum possible hours was used for savings calculations. VFDs on Pool Pumps: Circulation for the pools is supplied by a 3-hp pool pump with an integral VFD, and a 10-hp single-speed pump. Pool Measures

	2016, with a 1/2-hp factory-mounted circulation pump. Hot water for the kid's pool is supplied by a non-condensing Raypack pool boiler for which the size and manufacture date could not be confirmed, but is currently out of service. Circulation for the pools is supplied by a 3-hp pool pump with an integral VFD, and a 10-hp single-speed pump. The domestic hot water for the building is supplied by a 199,900 BTU condensing water heater manufactured in 2016. Ventilation for the locker rooms is supplied by a fan that appeared to have a manual control. The fan was inaccessible, so the size could not be confirmed. The interior lighting is a mix of CFL and T8 fluorescent fixtures, the exterior lights are CFL, and the exit signs are LED. The tennis courts have a switch for on-demand operation and are only enabled between 6:00 PM and 10:00 PM. There is a 7.98kW solar array that was installed in 2009.The Town of Superior North Pool facility presently has an average yearly peak demand of 33kW and consumes about 96,712kWh annually. The average annual cost of this energy is about $11,464. The facility presently consumes about 14,745 therms annually. The average annual cost of this energy is about $7,913. See the "Facility Energy Use" section for more information on energy consumption.			Motors: This outdoor pool is more susceptible to evaporation than typical indoor pools.
South Pool	*The Town of Superior South Pool is an outdoor pool facility with a 2,656 sq ft structure that houses a front desk, locker rooms, bathrooms, and mechanical spaces that contain the pool equipment. There is one main pool and one kid's pool. Operating hours are 6:00 AM to 8:00 PM Monday through Friday, and10:30 AM to 8:00 PM Friday and Saturday from Memorial Day through Labor Day. Heating for the building is supplied by both radiant and convective electric unit heaters. This facility only operates in the summer, and there is no cooling inside the building. Hot water for the main*	Pool boiler - non-condensing manufactured in 2020; so new, but are there electric boiler replacement options for end of life? DHW - 199.9 kBtu	445.1	Faucet aerators: The existing bathrooms sinks were found to have standard efficiency aerators with a flow rate at 2 gpm. LED Lighting: The interior lighting is a mix of CFL, and T8 fluorescent fixtures. The exterior lights are CFL. Operating hours for the interior lights are based on operation from Memorial Day through Labor Day. Operating hours for the exterior lights are assumed to be dusk to dawn year-round

	pool is supplied by a 999 kBTU non-condensing pool boiler manufactured in 2020, with a 1/2 hp factory-mounted circulation pump. Hot water for the kid's pool is supplied by a non-condensing Raypack pool boiler for which the size and manufacture date could not be confirmed. Circulation for the pools is supplied by a 1.5 hp, and two 5 hp single-speed pumps. There is an additional 7.5 hp single speed pump for the water slide. The domestic hot water for the building is supplied by a 199,900 BTU condensing tank water heater manufactured in 2020. Ventilation for the locker rooms is supplied by a fan that appeared to have a manual control; it was inaccessible, so the size could not be confirmed. The interior lighting is a mix of CFL and T8 fluorescent fixtures, the exterior lights are CFL fixtures, and the exit signs are LED. There is an 18.2 kW solar array that was installed in 2012. The Town of Superior South Pool facility presently consumes about 15,798kWh annually. Electrical demand data was not available for this commercial rate meter. The average annual cost of this energy is about $2,269. The facility presently consumes about 11,28 2therms annually. The average annual cost of this energy is about $5,766. See "Facility Energy Use" section for more information on energy consumption.	condensing tank water heater manufactured in 2020. Switch to electric at end of life.		VFDs on Pool Pumps: Circulation for the pools is supplied by a 1.5 hp, and two 5 hp single-speed pumps. Pool Measures: This outdoor pool is more susceptible to evaporation than typical indoor pools.
Town Hall	*The Town of Superior Town Hall is a 5,503 sq ft 1-story office building that was originally a residential home with a vented crawlspace and vented attic. This facility was originally built in 1906 but was remodeled in 1999. Primary heating and cooling area supplied by three residential-style gas-fired forced air furnaces in the attic. Only one of these was accessible and is a 97 kBTU high-efficiency condensing furnace manufactured in 2012. Rebate paperwork on file indicates the other two units are 97 and 110 kBTU, and they all appear to have been manufactured in 2012. These furnaces are paired with three 5-ton split*	3x gas-fired forced air furnaces in attic - manufactured in 2012. Paired with AC split systems Natural gas backup generator - Possible to tie solar array to new battery storage?	84	LED Lighting: Interior lighting is all LED. Exterior lights are nearly all LED, but there are two HID monument lights for the flagpole and one CFL recessed can in the canopy over the front porch. HVAC Maintenance: Coils on the mini-split heat pump condensers are clogged with tree cotton. Line Set Insulation: Lines of the refrigeration and split system air conditioner have damaged and missing insulation.

	system air conditioners manufactured in 2012. The HVAC systems are controlled by programmable thermostats with unoccupied setbacks. Cooling for the server room is supplied by one window AC unit whose size and manufacture date could not be confirmed and a 1-ton mini-split heat pump manufactured in 2015.The domestic hot water for the building is supplied by a 2kW electric 20-gal tank water heater manufactured in 2004 that is in the vented crawlspace below and is leaking from the bottom of the tank. The bathroom faucet aerators are Water Sense low flow (0.5 gpm) and fixtures are touchless. The interior lighting and exit signs are LED. The LED upgrades recommended include both full fixture and bulb replacement strategies. The exterior lights are a mix of LED, HID, and CFL fixtures. There is a small (~2 hp) pump in the crawlspace that appears to be associated with an old boiler system no longer in service. This facility has a natural gas backup generator, electric car charger that appears to be on its own separate electric meter, and 6kW solar array installed in 2009.The Town of Superior Town Hall facility presently has an average yearly peak demand of 28kW and consumes about 73,053kWh annually. The average annual cost of this energy is about $9,925. The facility presently consumes about 2,128 therms annually. The average annual cost of this energy is about $1,581. See "Facility Energy Use" section for more information on energy consumption.	How long are typical outages and could the backups be staged - battery first then natural gas? Water heater is electric	Envelope Improvements: This facility was originally a residential house and has typical residential construction with a vented attic and crawlspace. Fiberglass batts are used in the attic above the hearing room; however, blown fiberglass insulation appears to have been used for the rest of the building. There appears to be confusion about where the thermal boundary is in the attic above the hearing room. There is insulation both along the underside of the sloped roof deck and on the attic floor; typically one or the other approach is chosen. Further, some of the insulation installed on the underside of the roof deck is falling in places, and some of the blown insulation in the south attic has been compressed by foot traffic.

Wastewater Treatment	*The Town of Superior Wastewater Treatment Facility is separated into multiple buildings, with a total size of 33,531 sq ft. These buildings include The Headworks, Secondary Treatment Facility, Solids Handling (Digestions and Dewatering), and the Advanced Water Treatment Building. Most of the energy consumed by this facility is used by pumps and aeration motors, which are not all individually cataloged here. Most motors that have high operating hours are premium efficiency motors and many of them are new. Facility personnel said all motors that have a suitable variable load have VFDs controlling them. Some of the remaining motors are on timers. Two of the 50 hp aeration blower motors in the Secondary Treatment Building are at the end of their life. There is a large centrifuge in the Material Handling Building with a VFD that is set to be replaced. It is currently being shut off manually because it does not currently need to run 24/7. Primary space heating is supplied by electric and gas unit heaters controlled by non-programmable thermostats. Cooling for some of the office spaces is supplied by window AC units for which size and manufacture date could not be confirmed. Most of the interior and exterior lighting is LED; all exit signs are LED. Exterior lights are on photocells; however, one of the exterior area lights was on during the day which may indicate a faulty photocell. Domestic hot water for the Advanced Wastewater Treatment (AWT) Building is supplied by a 4.5 kW electric 50 gal tank water heater manufactured in 2005. Only one 1.5 gpm faucet aerator was found in the AWT Building. This facility has a diesel backup generator. The Town of Superior Wastewater Treatment Facility presently has an average yearly peak demand of 147kW and consumes about 346,073kWh annually. The average annual cost of this energy is about $37,159. See "Facility Energy Use" section for more information on*	Building is not in XE territory for natural gas. Gas unit heaters (non programmable thermostat) - replace with electric at end of life? Natural gas backup generator - Possible to tie to new battery storage? How long are typical outages and could backups be staged - battery first then diesel? Water heater is electric	10.3 kWh/ft2	Faucet Aerators: The one bathroom sink that was found has a standard efficiency aerator with a flow rate of 1.5 gpm. LED Lighting: Most interior and exterior lighting is LED; however, there are fifteen CFL wall packs throughout the four buildings. Facility personnel said three of the wall packs are on motion sensors and get less usage. Those hours are estimated to be half of a typical wall pack that is on from dusk to dawn. Exterior lights are on photocells; however, one of the exterior area lights was on during the day which may indicate a faulty photocell. Motor Replacement: While most of the motors in this facility are NEMA premium motors, facility personnel said there were two 50 hp aeration blower motors in the Secondary Treatment Building at the end of their life. Water Heater Domestic hot water for the Advanced Wastewater Treatment Building is supplied by a 4.5kW electric 50 gal tank water heater manufactured in 2005.

energy consumption. Natural gas is not provided by Xcel Energy; facility personnel did not provide information on their service provider. Natural gas bill history was not available for this report.

APPENDIX C: FUNDING RESOURCE DETAILS

There is a wide range of existing and anticipated funding opportunities and incentives to support beneficial electrification. The following sections summarize key programs, grants, tax credits, and other financial incentives available through Xcel Energy, the State of Colorado, and the Federal government.

Xcel Energy Rebates and Programs

Energy Efficiency Programs and Rebates

- Home Energy Audits
- Home Energy Squad
- Insulation and air sealing
- EnergyStar New Homes
- Energy Efficient Buildings
- Energy Design Assistance

Electrification Rebates

- HVAC heat pumps
- Water heating heat pumps

Electric Vehicles Programs and Rebates

- **Critical Peak Pricing Program** offers discounted rates for electricity used in charging electric vehicles, data insights, and monitoring.
- **EV Supply Infrastructure (EVSI) Program** offers low or no-cost installation of EV supply infrastructure, choice of pricing plan for charging, upfront consulting, and technical assistance. The program is open to fleets, workplaces, public charging stations, community charging hubs, and multifamily buildings.
- **Charger Service** is an option to pay a monthly fee for an Xcel Energy owned level 2 charger for multifamily, fleet, and workplace customers.
- **Small Business Rebate** offers a $2,500 rebate for wiring costs for small businesses.
- **New Construction Rebate** offers an allowance of $2,000 per charging port to support new multifamily construction for EV ready parking spots.
- **Income-Qualified Rebates** are available for eligible organizations. Qualifications vary depending on organization type. Rebate amounts are determined by the organization type as well as the level and number of chargers installed.
- **Residential Programs**
    - **Charger and Wiring Rebate** offers $500 or for income-qualified customers, a $1,300 - 2,500 rebate for home wiring or a level 2 charger.
    - **EV Accelerate at Home (EVAAH)** Xcel Energy installs and maintains a level 2 charger for a monthly fee on bill, with no upfront cost.
    - **Optimize Your Charge (OYC) Program** rewards customers for charging at times that benefit the grid.
    - **EV Purchase/Lease Rebate** offers income-qualified customers $5,500 for a new EV or $3,000 for a pre-owned EV.
    - **EV Network Dealers** have information on Xcel Energy programs and can provide the EV rebate at the point of sale.

Renewable Energy Programs

- Net Metering
- Solar*Rewards
- Battery*Connect

Federal Incentives

Inflation Reduction Act Rebates and Program

Energy Efficient Home Improvement Credit 25C

$2,000 rebate for electric heat pumps and heat pump water heaters

HOMES Program

$4,000 to $8,000 for efficiency and electrification projects

High-Efficiency Electric Home Rebate Program (HEERA)

- Heat Pump HVAC: $8,000
- Heat pump water heater: $1,750
- Electric stove/cooktop: $840
- Heat pump clothes dryer: $840
- Breaker Box: $4,000
- Electric wiring: $2,500
- Weatherization: $1,600

Clean Heavy-Duty Vehicles Grants and Rebates

$1 billion in funding, including replacing heavy duty vehicles with EVs and associated charging infrastructure.

Diesel Emissions Reduction

Funds grants and rebates that protect human health and improve air quality by reducing harmful emissions from diesel engines.

Low or No Emission Vehicle Program

The Low or No Emission competitive program provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities.

Rebuilding American Infrastructure with Sustainability and Equity (RAISE)

To build and repair critical pieces of our freight and passenger road, rail, transit, and port transportation networks. Criteria for innovation include electric vehicles.

Charging and Fueling Infrastructure (CFI) Discretionary Grant Program

A competitive grant program distributing $2.5 billion over five years to strategically deploy EV charging infrastructure and other alternative fueling infrastructure projects in urban and rural communities in publicly accessible locations, including downtown areas and local neighborhoods, particularly in underserved and disadvantaged communities.

EV, Commercial Clean Vehicle, and EV Infrastructure Tax Credits

Up to $7,500 Credit for new vehicles under 14,000 pounds, and for commercial vehicles above 14,000 pounds (up to $40,000). EV chargers are eligible for a tax credit of up to 30% of the cost, or 6% in the case of property subject to depreciation (not to exceed $100,000). Consumers who

purchase qualified residential fueling equipment through December 31, 2023 may receive a tax credit of up to $1,000.

State Incentives and Programs

Colorado EV Tax Credit

Up to $2,500 Credit for new vehicles

Charge Ahead Colorado

Offers an 80% match for charging station costs up to $9,000 for level 2 chargers and between $35,000 and $50,000 for DCFC chargers (depending charger power output).

ZEV Workforce Development Grant

This Colorado Department of Transportation (CDOT) grant addresses multiple challenges that Colorado and the wider mobility and electrification industry are facing: talent shortages, gaps in new skillsets, and the growing need for training due to technological advances.

E-Mobility Education and Awareness

This CDOT grant is designed to expand public awareness and education around EVs and increase public understanding of their benefits, capabilities, and availability.

I-Codes Technical Assistance

The Colorado Energy Office (CEO) offers free technical assistance for jurisdictions adopting 2021 I-Codes. Questions about building I-codes, how to review or inspect for a measure, how I-codes interact, or how to comply, can be submitted to CEO's free Code Helpline.

Colorado Heat Pump Tax Credit

Valid only for 2023 and 2024, this credit provides a 10% tax credit and sales tax exemption (2.9%), equating to a 12.9% discount on the price of equipment. These also extend to electrical panel upgrades and energy storage systems. See SB22-051 for more information.

Clean Fleet Enterprise Clean Fleet Vehicle and Technology Grant Program

Created to incentivize and support the use of electric motor vehicles and other clean fleet technologies by owners and operators of motor vehicle fleets. Includes a portfolio to provide training and development of a clean transportation workforce to support the adoption of clean fleet vehicles for use in motor vehicle fleets.

(Anticipated) Community Access Enterprise

Programs to equitably reduce and mitigate the adverse environmental and health impacts of air pollution and greenhouse gas emissions produced by motor vehicles. It includes several programs.

(Anticipated) Fleet Zero-Emission Infrastructure Program

Designed to support decarbonization of light-, medium-, and heavy-duty fleets - focusing on both depot and public infrastructure. Program anticipated to launch during the second quarter (Q2) of 2023.

(Anticipated) eCargo Bike Commercial Delivery Pilot Program

A pilot grant program available to community-based organizations, local governments, bike shops, delivery fleets, and others for replacing traditional delivery fleet vehicles with eCargo bikes. Grant program anticipated to open for applications spring 2023.

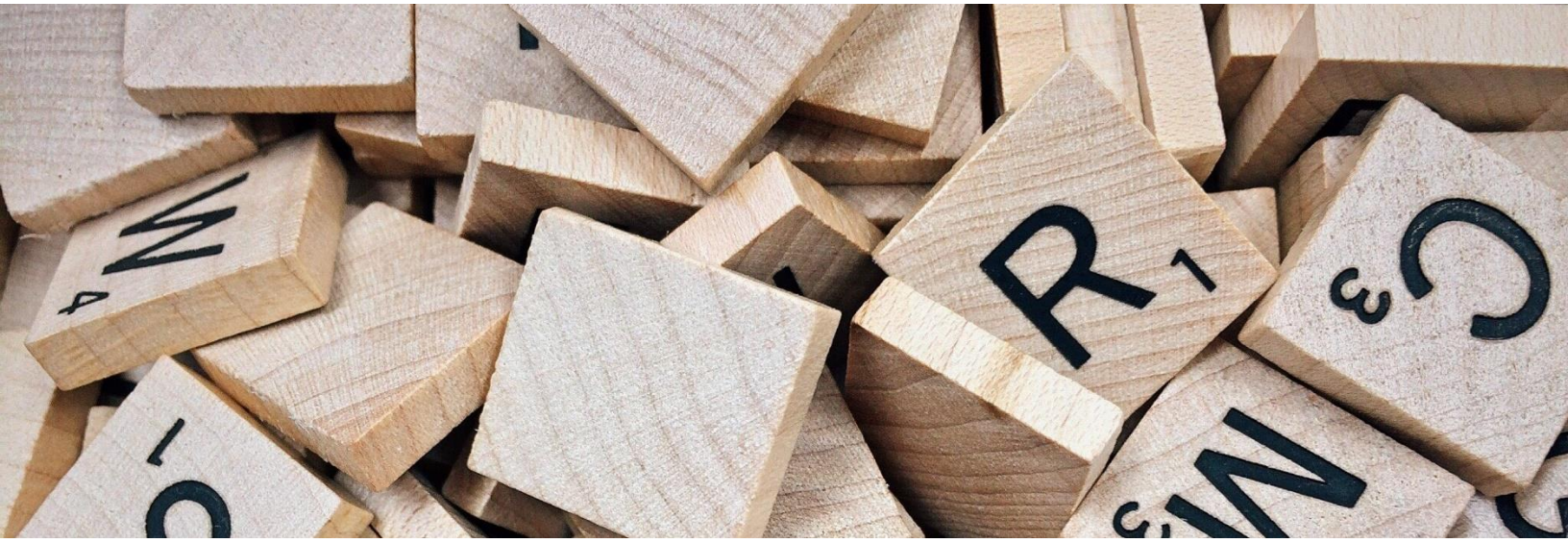
(Anticipated) Vehicle Exchange

State rebate program to encourage income-qualified Coloradans to replace high-emitting vehicles with EVs and other low-emitting mobility options. Program anticipated to start summer 2023.

(Anticipated) Community-Accelerated Mobility Project

Develop mobility solutions that meet needs specific to local communities, including flexible funding that includes electric carshare, electric vanpool, community eBike share, community charging infrastructure, and others.

APPENDIX D: GLOSSARY OF TERMS



The following section defines a list of terms related to utilities, energy use, building electrification, and transportation electrification. While this list is not comprehensive, it does include some terms not present in this plan, but potentially useful for reference throughout implementation.

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

Battery Electric Vehicle (BEV): An all-electric vehicle, fueled by plugging into an external charger, that has no tailpipe emissions. Requires low maintenance costs.

British Thermal Unit (BTU): The amount of heat needed to raise one pound of water at maximum density through one degree Fahrenheit

Beneficial Electrification: The replacement of direct fossil fuel use that results in either lower costs, reduced emissions, or more effective use of the power grid.

Building Electrification: Transitioning fossil-fueled appliances to ones powered by electricity, such as HVAC or water heating systems.

Carbon-free: Sources of energy that will not emit additional carbon dioxide into the air. Wind, solar, and nuclear energy are all carbon free sources, but only wind and solar are renewable.

Carbon-neutral: Also described as "net zero"; could include carbon-free sources but is broader and refers to energy that removes or avoids as much carbon dioxide as is released over a set period of time. Is sometimes used to describe a site that produces an excess amount of electricity from a renewable energy source, such as solar, compared to what it consumes. That excess energy is put back into the electric grid, in an amount that offsets the

carbon dioxide produced from the electricity it draws from the grid, when it is not producing renewable energy.

Coefficient of Performance: Discussed in relation to equipment such as space and water heaters or heat pumps, it represents the ratio of energy input to useful energy outputted. For heating, useful energy outputted refers to the energy outputted as heat; energy input refers to the electricity or natural gas required to generate or move that energy

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. 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 Current (DC): The form of electricity where the current only flows in one direction. This is the type of electricity that batteries both supply and require to charge. EV chargers must convert the supplied AC electricity to DC power.

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

Electric Vehicle (EV): A vehicle that uses an electric engine for all or part of its propulsion.

Electric Vehicle Supply Equipment (EVSE): Infrastructure, such as chargers, electrical supplies, etc., required to support EVs.

Emissions Factor: Quantity of emissions released per unit of energy use.

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

Energy Reduction: The result of behavior changes that cause less energy to be used. For example, setting the thermostat to a lower temperature *reduces* the energy used in your home during the winter. Since energy reductions can be easily reversed, they are not accounted for when calculating changes in energy usage.

Energy Savings: Comes from a permanent change that results in using less energy to achieve the same results. A new furnace uses X% less energy to keep your home at the same temperature (all things being equal), resulting in energy *savings* of X%. For accounting purposes, energy savings are only counted in the year the new equipment is installed.

EV-Ready Codes: Local government codes that require installation of a 40 amp, 208/240 volt, dedicated branch circuit (similar to that of an electric dryer or oven), along with a circuit terminating in a receptacle, junction box, or EV charging station at certain parking facilities (Southwest Energy Efficiency Project, 2023).

Fleet Electrification: Replacing internal combustion engine vehicles with equivalent electric vehicles in a public or business fleet.

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 (H_2O), carbon dioxide ($CO_{2)}$, methane (CH_4), nitrous oxide (N_2O), and ozone (O_3).

Grid Decarbonization: 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.

Gross Floor Area (GFA): Total of all floor areas of a building included in the building between exterior walls.

Heavy-Duty Vehicles: Commercial vehicles over a minimum Gross Vehicle Weight Rating (GVRW) of 8,500 lbs.

HVAC: Heating, Ventilation, and Air Conditioning

Hybrid Electric Vehicle (HEV): Contains both an electric motor and a gasoline engine. The gasoline engine powers a generator that charges the electric motor. No external battery charger is used. Runs at a constant speed, which increases fuel efficiency.

Internal Combustion Engine (ICE): Traditional vehicle engine that uses the direct combustion of gasoline, diesel, or other fuels.

Kilowatt-hour (kWh): A unit of electricity consumption. For EVs, it is the amount of electricity being sent to the EV battery from the charger in one hour. This is calculated by volts times amps divided by 1,000.

Level 1 Charging Station: Uses a standard 120-volt AC outlet and can take 8 to 12 hours to fully charge a depleted battery; intended for residential use only.

Level 2 Charging Station: Uses a 220-volt or 240-volt AC outlet and can fully charge a depleted battery in 4 to 6 hours; can be used in both residential and commercial settings.

Level 3/DC Fast Charging Station: Uses an industrial 480-volt DC outlet and can charge a battery to 80% in 20 to 30 minutes; used in commercial settings where the anticipated charge time is limited (e.g., supermarket, gas station); will be used on Alternative Fuel Corridors – a national network of major thoroughfares supporting EVs and other alternative fuels.

Light-Duty Vehicles: Passenger cars with a maximum Gross Vehicle Weight Rating (GVRW) of 8,500 lbs.

Micromobility: Transportation using lightweight vehicles such as bicycles or scooters, including electric bicycles and scooters, often used to travel short distances.

Million British Thermal Units (MMBtu): Unit of energy consumption that allows electricity and natural gas consumption to be combined.

Metric Tons of Carbon Dioxide Equivalent (MTCO2e): Unit of measure for greenhouse gas emissions. The unit "CO2e" represents an amount of a greenhouse gas whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO_2), based on the global warming potential (GWP) of the gas.

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

Plug-in Hybrid Electric Vehicle (PHEV/PEV): Contains both an electric motor and a gasoline engine. An external plug is used to fuel the electric motor. The electric motor is used until the battery is depleted; at this point the gasoline engine takes over. Offers lower tailpipe emissions than traditional ICE vehicles and longer ranges than most BEVs.

Premise: A unique combination of service address and meter. For residential customers, this is the equivalent of an individual house or dwelling unit in a multi-tenant building. For business customers, it is an individual business, or for a larger business, a separately-metered portion of the business's load at that address.

Range Anxiety: Fear of running out of power in an EV before reaching a charging station or desired destination.

Range Per Hour (RPH): A measurement of the miles an EV can travel on one hour of charge. This is generally applied to EV charging stations and expressed in terms of typical EV efficiency.

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

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 existing building systems can be tuned up to run as efficiently as possible.

Solar Garden: Shared solar array with grid-connected subscribers who receive bill credits for their subscriptions.

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

Subscription: Agreement to purchase a certain amount of something at regular intervals.

Therm (thm): Unit of natural gas consumption.

Trade Partner: Also known as Trade Ally or Business Trade Partner. 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.

Transportation Electrification: Transitioning fossil-fueled vehicles to ones powered by electricity, such as passenger vehicles or transit.

Vehicle Miles Traveled (VMT): A way to measure the integration of EVs and associated reduction in GHG emissions by considering electric miles that replace traditional vehicle miles.

Volts: Measurement of the force pushing the flow of energy through a charger. Determined by electricity supply. Standard household outlets provide 120 volts; outlets for dryers or other high-powered household equipment supply 240 volts.

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