



An Energy Action Plan for Lone Tree

February 2022



PARTNERS IN ENERGY
An Xcel Energy Community Collaboration

ACKNOWLEDGEMENTS

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

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Lone Tree Energy Action Plan

Our Commitment

Creating and maintaining a healthy, safe, and livable community for today and future generations is something the City of Lone Tree (City) has prioritized since incorporating in 1995. Building on this foundation, this Energy Action Plan was developed in 2021 with a group of community stakeholders representing City staff, residents, and businesses. Over the course of six months, this Planning Team participated in a series of four workshops facilitated through Xcel Energy’s Partners in Energy program. Through this process, the Planning Team defined the community’s energy vision and goals, as well as strategies for achieving those goals.

Our Energy Goals

By June 2023, Lone Tree will...

- ✓ Increase participation in energy saving programs by 45 percent from 2020 levels (350 additional program participants).
- ✓ Save 6,200 MTCO₂e annually from energy saving activities, equivalent to 3.8 percent of its 2020 building energy-related emissions.

Achieving Lone Tree’s Vision and Goals: 4 Focus Areas, 9 Strategies:



Municipal Operations

- ✓ M-1: Municipal Facility Energy Assessments & Improvements
- ✓ M-2: Renewable Energy for Municipal Facilities



Residents

- ✓ R-1: Residential Energy Education
- ✓ R-2: Multifamily Property Outreach
- ✓ R-3: Home Energy Squad® Buy-Down Campaign



Businesses and Institutions

- ✓ B-1: Business Energy Assessment Outreach
- ✓ B-2: Sustainable Business Program



New Construction

- ✓ N-1: Targeted Developer and Builder Outreach
- ✓ N-2: Sustainable Energy Construction Guidelines and Codes

Our Energy Vision

The Lone Tree community is committed to collaborating toward a sustainable future that provides equitable access to renewable energy and energy efficiency.



2020 Energy Profile

The Planning Team used historic energy use to inform goal and strategy development, and set 2020 as its baseline. In 2020, the Lone Tree community:

- ✓ Consumed 242.7 million kWh of electricity
- ✓ Consumed 8.8 million therms of natural gas
- ✓ Contributed more than 161,000 metrics tons of carbon dioxide equivalent (greenhouse gas emissions) from energy
- ✓ Spent \$27 million on energy costs

By implementing this plan, we will,



Engage with over **6,900 residents and businesses** on Xcel Energy programs



Increase the number of residents and businesses who participate in Xcel Energy programs to a **total of 1,200**



Save **7.6 million kWh** of electricity and **111,500 therms** of natural gas



Save over **7,100 metrics tons** of carbon dioxide equivalent (greenhouse gas emissions)



Save **\$764,000** in Lone Tree's community energy costs

Interested in supporting this plan? Here's how you can help!

- ✓ Residents can sign up for a Home Energy Squad® visit to identify savings opportunities at home and receive FREE energy efficiency products. Visit xcelenergy.com/HomeEnergySquad to learn more.
- ✓ Businesses can sign up for a FREE energy assessment that may include FREE direct installation of energy efficiency products. An energy specialist will help identify efficiency improvement opportunities and work with businesses to identify equipment rebates. Visit xcelenergy.com/SBES to learn more.
- ✓ Interested in renewable energy? Visit xcelenergy.com/renewables to learn more about Xcel Energy's low-cost renewable energy program options for residents and businesses.

INTRODUCTION



Creating and maintaining healthy, safe, livable communities for today and future generations is something the City of Lone Tree (City) has prioritized since first incorporating in 1995. This focus is reflected in the Lone Tree Comprehensive Plan, which includes objectives related to energy and water conservation, air quality, supportive economy, and social connections. In practice, Lone Tree City employees and community members have completed many projects that support community sustainability, several of which are listed in the Existing Energy Efforts section of this plan.

In 2021, the City continued its commitment to sustainability by developing its first Energy Action Plan through Xcel Energy's Partners in Energy program. This Energy Action Plan summarizes the community energy baseline, documents Lone Tree's energy priorities, sets goals to measure progress, and identifies actionable strategies for the next two years.

Planning Process

The creation of this Energy Action Plan began in February 2021 with the identification of a group of community stakeholders representing Lone Tree residents, businesses, and institutions (see Acknowledgements for a complete list). Over the course of six months, these stakeholders, referred to as the Planning Team, participated in a series of four workshops in collaboration with the City of Lone Tree and Xcel Energy Partners in Energy. During the workshops, the Planning Team gained a common understanding of Lone Tree's energy baseline and developed a community energy vision, goals, and strategies. After the workshop series, the Planning Team reviewed this planning document before sending it to the Lone Tree City Council for approval.

About Partners in Energy

Xcel Energy is an electric and natural gas utility that provides the energy that powers millions of homes and businesses across eight Western and Midwestern states. Each community Xcel Energy serves has its own unique priorities and vision for its energy future. To continue to innovatively support its communities, Xcel Energy launched Partners in Energy in 2014 as a collaborative resource with tailored services to complement each community's vision. The program offerings include support to develop an energy action plan, tools to help implement the plan, and resources designed to help each community stay informed and achieve their outlined goals. Lone Tree applied to Partners in Energy in 2021, joining more than 30 other Colorado communities.

Existing Energy Efforts

- All of Lone Tree's traffic signals have been converted to LED lighting, resulting in a cost savings of 60 percent. Moving forward, all future installations of streetlights will also be energy-efficient LEDs.
- Lone Tree has completed six LED lighting projects over the last three years and two energy audits across its four municipal facilities.
- The City of Lone Tree Employee Sustainability Committee is a cross-departmental, volunteer employee group that promotes a sustainable Lone Tree community through a collaborative and innovative approach to environmental, social and economic well-being.
- The Lone Tree Sustainability Team was formed by a group of residents and businesses in February 2020 to create educational opportunities for the community, organize actions to address sustainability needs, and influence and support long-term decisions that align with sustainable solutions (The Lone Tree Sustainability Team, 2020).
- The RidgeGate master planned community incorporates sustainable design principles to develop energy-wise homes. ParkSide at RidgeGate by Harvard Communities and Berkeley Homes was the first all-solar neighborhood in Colorado (RidgeGate, 2020).
- The Lone Tree Arts Center is LEED-certified, a global certification recognizing buildings designed to be environmentally responsible and use resources efficiently.
- The Charles Schwab Lone Tree campus has LEED Platinum and LEED Gold certified buildings due to many sustainable design features, including energy efficiency, indoor air quality monitoring, and an on-site solar array. In addition to building efficiently, Schwab participated in energy savings programs such as Xcel Energy's Energy Efficient Building program which saved 500,000 kWh in electricity and implements an Active Energy Management program to ensure systems are running optimally through continuous improvement, reducing campus energy use by over 60% since 2014. Charles Schwab also supports Xcel Energy's renewable programs at the Public Utility Commission level to help ensure renewable energy is available for all of Lone Tree.

WHERE WE ARE NOW



To better understand what we want Lone Tree’s energy future to look like, we must understand the existing energy landscape. This section includes an overview of energy efforts in Lone Tree, followed by a summary of energy data trends.

Community Energy Data

An integral part of the Partners in Energy planning process is reviewing historic energy data that informs our community’s energy baseline. Xcel Energy provided data on energy use, participation counts in utility energy conservation programs, and associated energy savings for Lone Tree, as detailed in the following sections. Historic energy data for the period 2018-2020 were analyzed to find opportunities to reduce energy use, save money, and transition to renewable energy, with the most recent year of available data at the time of plan development (2020) serving as the baseline year, chosen for its relative energy savings and renewable energy adoption. Appendix C: Baseline Energy Analysis includes a comprehensive picture of Lone Tree’s baseline energy data.

Community Energy Use

Xcel Energy serves electricity and natural gas to 7,670 unique locations (known as premises) in the City of Lone Tree. In 2020 the Lone Tree community used 242.7 million kWh of electricity and 8.8 million therms of natural gas which, combined, is equivalent to 1.7 million MMBtu of energy (Figure 1).

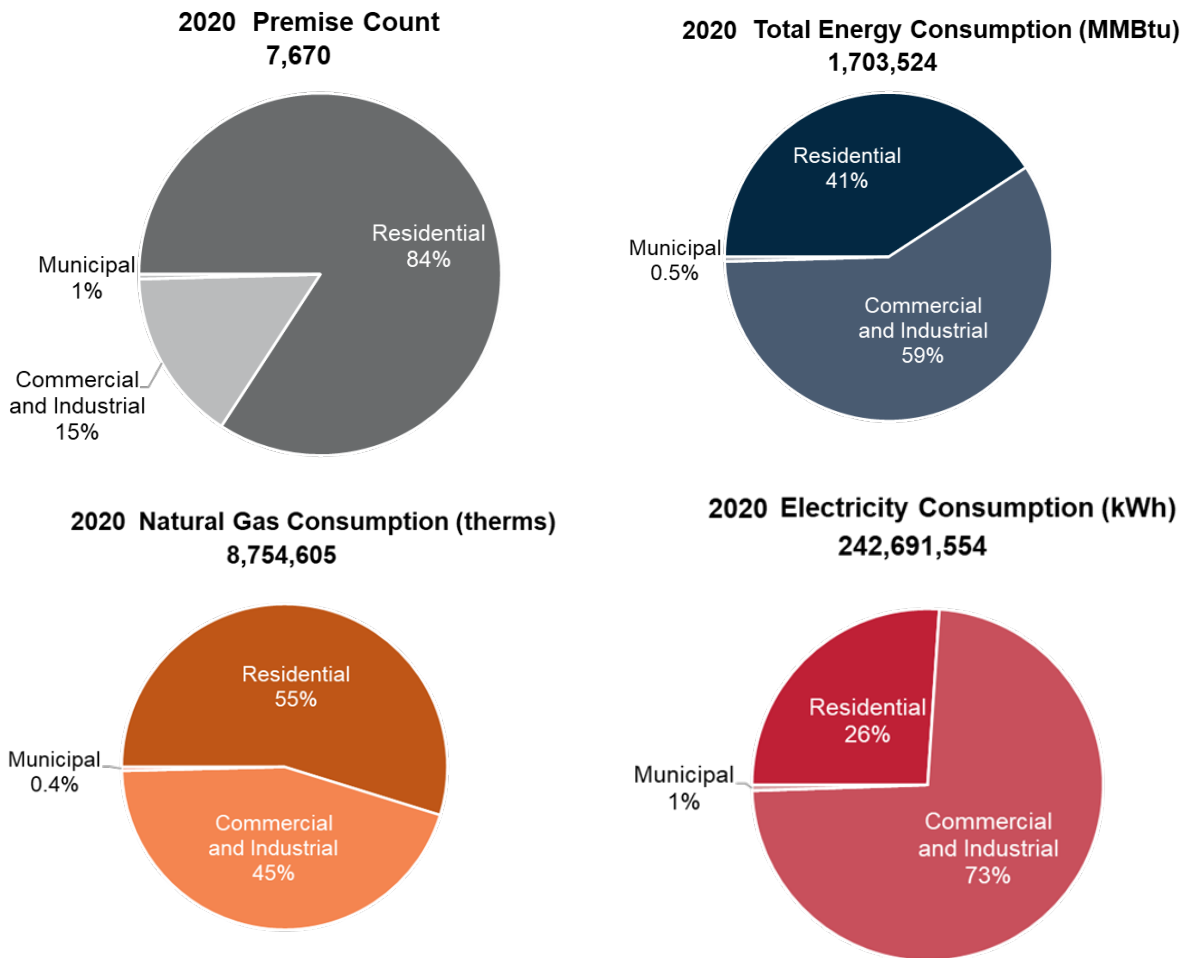


Figure 1 2020 Community Energy Use by Sector

Figure 1). Despite residential premises being the overwhelming majority, commercial and industrial (C&I) premises use 59% of total energy and pay about two-thirds of the energy costs across the community (Figure 3). This finding is largely a function of much higher energy costs per premise for C&I customers. While only 31% of residential energy use is attributed to electricity, electricity use for the C&I sector is 61% of total energy use. This breakdown presents significant opportunities for C&I customers to lower their energy bills through measures that both reduce their electricity use and shift their peak demand. While C&I opportunities may produce larger energy savings, residential energy saving opportunities for both electricity and natural gas should also be considered given the number of customers in the sector.

The municipal sector follows a similar breakdown of fuel use, with about 57% of total energy attributed to electricity in City-owned premises. Higher electricity use contributes to higher energy bills for C&I and municipal sectors compared to residential premises

(Figure 3 and Figure 3). Many of the municipal premises are for outdoor lighting, lowering the overall energy cost per premise compared to C&I customers. Additionally, this distribution means municipal and C&I customers can cover a significant portion of their energy use through available renewable electricity programs. However, renewable energy supplies are generally available at a cost premium that is less attractive to business owners, and few C&I or municipal customers (1.6% of C&I premises, 0.0% of municipal premises) in Lone Tree currently take advantage of renewable energy programs.

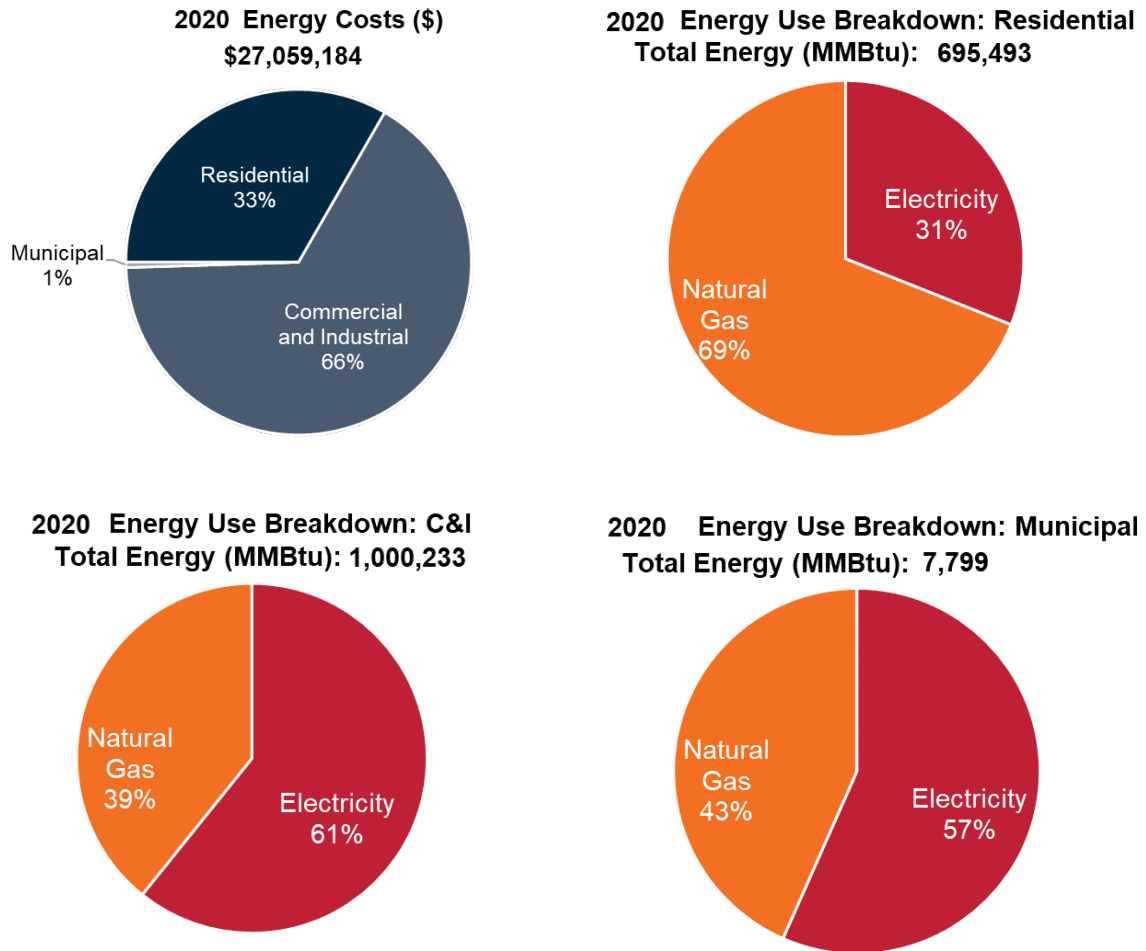


Figure 2: Energy Costs in Residential and Municipal Premises

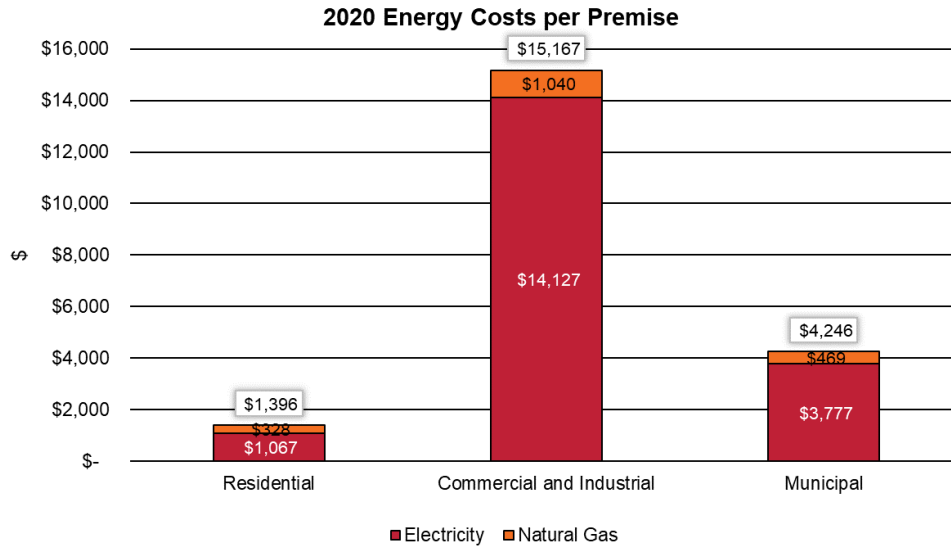


Figure 3: 2020 Energy Costs per Premise

As Lone Tree grows, its energy use and total community energy costs are projected to increase. A large development underway in Lone Tree named RidgeGate is anticipated to bring a total of 10,000 homes and 30,000 new residents to Lone Tree over the next 20 years. With the increase in population anticipated in Lone Tree, energy costs are also anticipated to increase by nearly 70 percent from \$27.1 million to an estimated \$45.7 million once the RidgeGate development is complete (Table 1). This growth underscores the importance of developing strategies to adopt both energy efficiency and renewable energy measures across Lone Tree, particularly in new construction.

Table 1. RidgeGate Build-Out Impacts to 2020 Lone Tree Population and Energy Costs

Anticipated Growth from RidgeGate	2020 ¹	Estimate at RidgeGate Build-Out	Percent Increase
Population	14,500	44,500	+206%
Dwellings	5,748	15,748	+178%
Energy Costs	\$27,059,000	\$45,689,000	+69%

¹ Population and Dwelling data provided by City of Lone Tree website for Demographic Data (<https://cityoflonetree.com/departments/economic-development/demographic-data/>)

Greenhouse Gas Emissions

Building electricity and natural gas usage in Lone Tree contributed over 161,000 metric tons of carbon dioxide equivalent (MTCO_{2e}) to total emissions in 2020. The scale of Lone Tree’s energy emissions is the same as what 35,000 standard passenger vehicles would produce if they were driven for a full year (EPA, 2021). Energy consumption-related greenhouse gas emissions have declined in Lone Tree over the past three years (Figure 4), largely due to the “greening of the grid” - the process of adding more renewable energy supplies into the source fuel mix to support electricity generation.

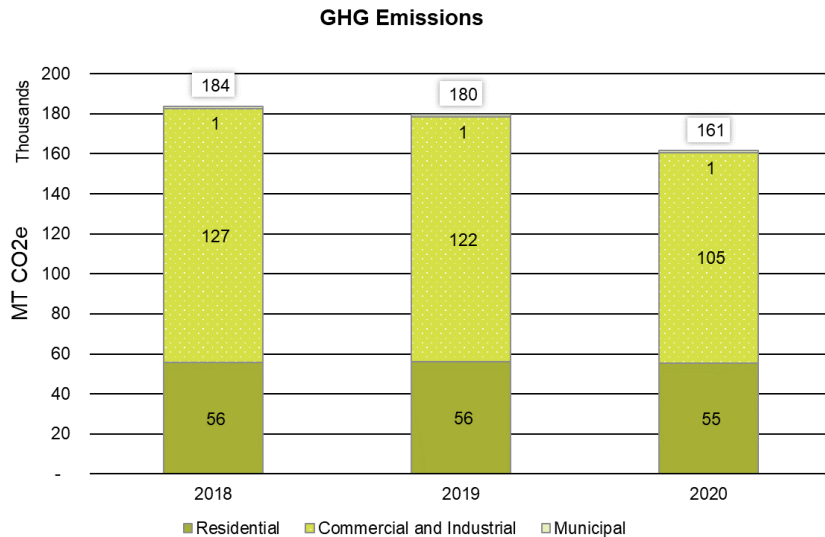


Figure 4. City of Lone Tree 2018-2020 GHG Emissions by Sector

In Xcel Energy territory, emissions related to electricity consumption and generation are projected to continue to decrease in the future. Through increasing its renewable electricity generation resources, Xcel Energy has a 2030 goal of 85 percent lower carbon emissions from electricity and a vision of 100% carbon-free electricity emissions by 2050 from a baseline of 2005.

Program Participation

Xcel Energy offers a variety of energy efficiency rebates and programs, and renewable energy options that provide customers energy and cost savings along with access to carbon-free energy sources for both existing buildings and new construction. In 2020, approximately 6 percent of C&I premises and 3 percent of residential premises participated in energy efficiency programs, which is slightly higher than other Partners in Energy communities across Colorado (Table 2), but indicates a significant opportunity to increase total cost savings by increasing participation. Also in 2020, 1.6 percent of C&I premises and 7.4 percent of residential premises participated in renewable energy programs, which was also higher than Partners in Energy communities across the state (Table 3).

Table 2. 2020 Energy Efficiency Program Participation in Lone Tree

Sector	Energy Efficiency Program Participation (#)	Participation (%)
Residential	194	3.0%
Commercial and Industrial	72	5.9%
Total	266	3.5%

Table 3. 2020 Renewable Energy Program Participation in Lone Tree

Sector	Renewable Energy Program Participation (#)	Participation (%)
Residential	475	7.4%
Commercial and Industrial	20	1.6%
Total	495	6.5%

The top residential energy efficiency programs in Lone Tree in 2020 include equipment-based upgrades through the High Efficiency Air Conditioning, Residential Heating, and Refrigerator & Freezer Recycling rebate programs. In the C&I sector, the top energy efficiency programs in 2020 were lighting and equipment upgrades through Small Business Lighting and Lighting Efficiency, Cooling, and Commercial Refrigeration Efficiency rebate programs.

Over the last three years, participation in energy efficiency programs has fluctuated, with 2020 having the lowest participation rates (Figure 5). Energy savings resulting from program participation has not followed the same trend, with 2020 electricity savings being the second highest and 2020 natural gas savings being the highest of the last three years (Figure 6 and Figure 7).

2020 Commercial Energy Trends

In 2020, energy consumption by the commercial sector fell by a record of 7% across the U.S. due to the pandemic that caused many offices and businesses to close their doors temporarily and, in some cases, permanently (U.S. Energy Information Administration, 2021). Lone Tree saw a similar decline, with an 8% decrease in commercial energy use when comparing 2019 and 2020. While this shutdown was devastating to many businesses, many were still able to complete significant energy savings projects, which led to energy saving levels comparable with 2018-2020 average savings. Because of this relative consistency, energy savings achieved through Xcel Energy program participation was chosen as the goal metric for Lone Tree to measure its progress against. Energy savings is an effective way to measure progress, while removing variables that are difficult to control, such as shifts in building occupancy and weather.

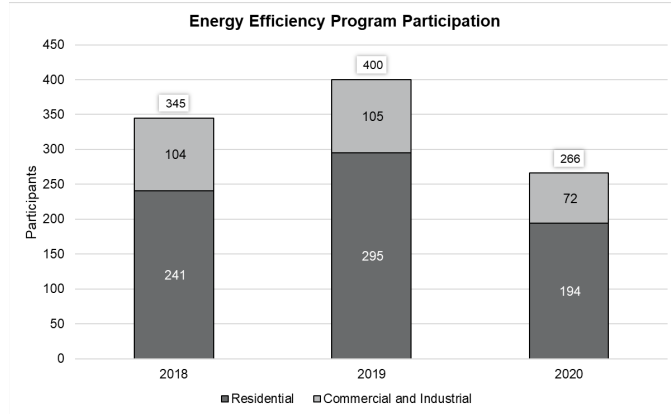


Figure 5. 2018-2020 Energy Efficiency Program Participation

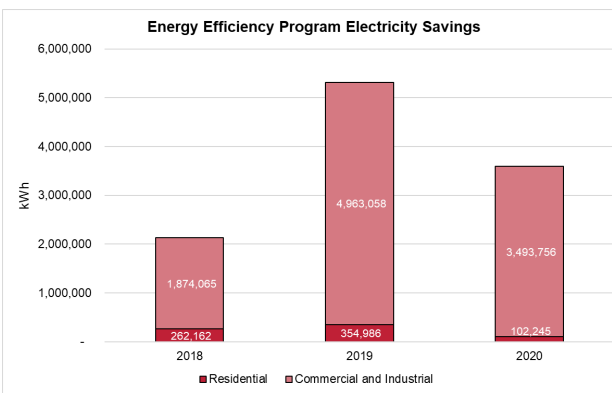


Figure 6. 2018-2020 Electricity Savings from Energy Efficiency Programs

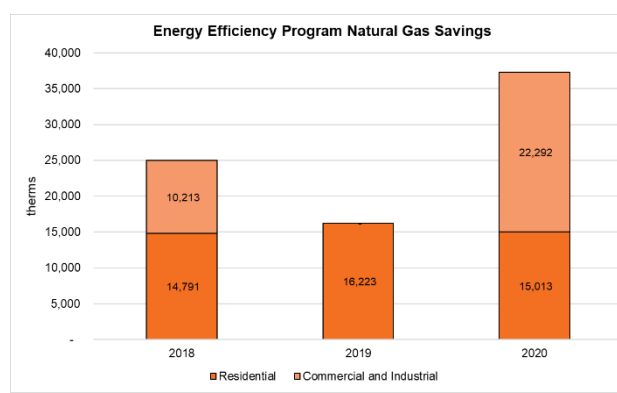


Figure 7. 2018-2020 Natural Gas Savings from Energy Efficiency Programs

As a part of the overall C&I energy efficiency program participation and savings, Lone Tree’s four municipal facilities have completed several projects that achieved energy savings, as shown below in Table 4. Lone Tree has accomplished six LED lighting projects over the last three years and completed two energy audits across the municipal facilities.

Table 4. Lone Tree Municipal Energy Efficiency Program Metrics

Year	Participation	Electricity Savings (kWh)	Natural Gas Savings (therms)	Programs
2018	1	425	0	Small Business Lighting - 1
2019	7	119,000	0	Lighting Efficiency – 5 Business Energy Analysis – 2
2020	0	0	0	n/a
Total	8	119,425	0	

In 2020, City of Lone Tree residents and businesses have taken advantage of both subscription-based and on-site renewable energy programs offered by Xcel Energy. Of the five renewable energy programs offered, Windsource, Renewable*Connect and Solar Rewards Community are subscription-based, whereas Solar*Rewards and Net Metering are on-site solar installations. The most utilized program for residents in 2020 was Windsource, a subscription-based renewable energy offering (Table 5). In the business community, the majority of participants installed on-site solar and utilized the Solar*Rewards program. In 2020, the subscription-based program Renewable*Connect was fully subscribed, however some residents and one business participated prior to the program reaching capacity and remain subscribed. The Net Metering participants shown in Table 5 are representative of the total number of on-site net metered systems installed since 2016.

Overall, 6.1 million kWh of electricity use in Lone Tree was subscribed to or generated through renewable energy programs. This represents three percent of overall commercial electricity use and two percent of overall residential electricity use in the community in 2020. The City of Lone Tree municipal facilities have not participated in renewable energy programs. Given the scale of historic electricity enrolled in renewable energy programs, there is an opportunity to strategize ways to increase renewable energy use in the City of Lone Tree, both at the community scale for residents and businesses and for the municipal scale at city facilities.

Table 5. City of Lone Tree 2020 Renewable Energy Program Participation and Electricity

Renewable Energy Program	Commercial & Industrial		Residential	
	Participation	Total Electricity (kWh)	Participation	Total Electricity (kWh)
2020 Xcel Energy Windsource®	0	0	252	641,821
2020 Xcel Energy Renewable*Connect®	1	165,470	8	37,334
2020 Xcel Energy Solar*Rewards (on-site)	17	3,346,942	147	454,085
2020 Xcel Energy Solar*Rewards Community	1	1,496,082	0	0
Net Metering (on-site solar)	1	Total unknown	68	Total unknown
Total	20	5,008,494	475	1,133,240

WHERE WE ARE GOING



Energy Vision Statement

During the planning process, the Energy Action Team created a vision statement for this Energy Action Plan. This statement helped guide the planning process and reflects the intention of the community.

The Lone Tree community is committed to collaborating toward a sustainable future that provides equitable access to renewable energy and energy efficiency.

The City’s Diversity and Inclusion team states that equity occurs by creating systems that enable all to thrive, equity honors the intentionality of inclusion – giving respect and attention to the rich diversity around us, and equity can happen through designing, evaluating and correcting systems and markets to ensure they deliver equally well for all. Equity in the context of this Energy Action Plan means that outreach and other strategy implementation efforts will be designed in a variety of inclusive ways to reach all community members. Details on how strategies will be implemented equitably will be discussed by the Energy Action Team as part of the implementation process.

Focus Areas

To achieve a community-wide commitment to energy stewardship, the Energy Action Team identified the following focus areas to prioritize strategies and resources.



Municipal Operations



Businesses and Institutions



Residents



New Construction

Goals

Working together, the Team set the following goals to measure success:

- By the end of June 2023, Lone Tree will increase participation in energy saving programs by 45 percent from 2020 levels (350 additional program participants).
- By the end of June 2023, Lone Tree will save 6,200 MTCO₂e annually from energy saving activities, equivalent to 3.5 percent of its 2020 building energy-related emissions.

HOW WE ARE GOING TO GET THERE



The planning team identified nine strategies necessary to achieve Lone Tree’s vision and goals.

- M-1: Municipal Facility Energy Assessments & Improvements
- M-2: Renewable Energy for Municipal Facilities
- R-1: Residential Energy Education
- R-2: Multifamily Property Outreach
- R-3: Home Energy Squad® Buy-Down Pilot Program
- B-1: Business Energy Assessment Outreach
- B-2: Sustainable Business Program
- N-1: Targeted Developer and Builder Outreach
- N-2: Sustainable Energy Construction Guidelines and Codes

The following sections provide implementation details for each of the strategies, which are organized by focus area.



Focus Area: Municipal Operations

Lone Tree has an opportunity to lead by example by advancing energy efficiency and renewable energy in its four municipal facilities. This focus area identifies how Lone Tree will demonstrate energy action leadership and realize energy cost savings at these facilities.

M-1: Municipal Facility Energy Assessments & Improvements

Description

Energy audits can help identify cost-effective energy efficiency projects that will result in energy and cost savings. The City of Lone Tree has recently completed audits for three of its four facilities. This strategy involves 1) completing audits for the remaining municipal facility, 2) reviewing all audit results to form a prioritized plan to address opportunities identified, and 3) implementing the audit recommendations as feasible. As part of this process, the City will continue its efforts to replace all lighting with LEDs, which has consistently been identified as a major energy and cost saving opportunity.

Target Audience

Municipal Facilities

Target Outcome

- Complete 1 municipal facility energy assessment in 2022
- Implement 4 energy efficiency projects at municipal facilities by the end of June 2023
 - Replace 100 percent of municipal facility lighting with LEDs by the end of June 2023

Scope and Timeline

2022 Q1	<ul style="list-style-type: none"> • Schedule and complete a business energy assessment for the Public Works Facility (13750 W Parker Rd. / 10151 First St.) • Review energy efficiency project opportunities identified in 2019 audits at Lone Tree Civic Center, Arts Center, and Municipal Center • Confirm remaining LED lighting conversion opportunities at Lone Tree facilities • Explore financing options to support funding energy efficiency projects through rebates, energy performance contracts, grant funding, and capital budget
2022 Q2-Q3	<ul style="list-style-type: none"> • Develop a plan for implementing feasible audit energy efficiency recommendations, including a phased LED replacement plan <ul style="list-style-type: none"> ○ Identify any further analysis needed to consider other energy efficiency opportunities ○ Outline a proposed implementation schedule for energy efficiency recommendations to help inform budget requests ○ Support technical analysis needed to phase implementation of recommendations

	<ul style="list-style-type: none"> • Prepare and submit any necessary 2023 budget requests by the end of Q2 2022
2022 Q4 – 2023 Q2	<ul style="list-style-type: none"> • Incorporate results of the Public Works Facility Business Energy Assessment into the implementation schedule • Implement targeted energy efficiency projects

Roles and Responsibilities

City Staff	<ul style="list-style-type: none"> • Public Works Department, Facilities Manager (Justin Russell) to lead audit process and project implementation • Public Works Department, Facilities Manager (Justin Russell) to lead budget request submission process
Community Partners	<ul style="list-style-type: none"> • Charles Schwab (Terry Smith) and Park Meadows (Whitney Miller & Willie Pollard) to share lessons learned from their energy audits and how the business case was made to their leadership
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to support technical analysis of energy efficiency implementation schedule and facilitate connecting resources to support funding • Xcel Energy Account Manager (Susan Davis) to support audits and large improvement projects, including LED parking light replacements

Required Resources

- City staff time to coordinate and review audits (estimated 8 hrs.)
- City staff time to plan and implement recommended projects (estimated 40 hrs.)
- Potential City budget to conduct audits (estimated \$0-500)
- City budget to fund projects (TBD)

Other Notes

Opportunities identified in 2019 audits (by building)

- Lone Tree Arts Center – 10075 Commons St. (2019)
 - LED Lighting
 - HVAC Unit Replacement (chiller)
- Lone Tree Civic Center – 8527 Lone Tree Pkwy. (2019)
 - LED Lighting
 - HVAC Unit Replacement (split system air conditioners)
- Lone Tree Municipal Building – 9220 Kimmer Dr. (2019)
 - LED Lighting

M-2: Renewable Electricity for Municipal Facilities

Description

This strategy explores opportunities to increase the amount of municipal facility energy use powered from renewable sources by either 1) installing on-site solar at municipal facilities or 2) subscribing to available renewable energy programs through Xcel Energy.

Target Audience

Municipal Facilities

Target Outcome

- Enroll the Lone Tree Civic Center (8527 Lone Tree Pkwy.) in a subscription-based renewable energy program by the end of 2023.
- Explore feasibility of achieving 100 percent renewable electricity at the remaining three Lone Tree buildings by the end of 2023 through a combination of on-site solar (preferred) and subscription-based (second preference) renewable energy options
 - Lone Tree Arts Center (10075 Commons St.)
 - Lone Tree Municipal Building (9220 Kimmer Dr.)
 - Lone Tree Public Works Facility (13750 W Parker Rd. / 10151 First St.)

Scope and Timeline

2022 Q1-Q2

- Determine renewable energy priorities to inform on-site or subscription options for municipal facilities (e.g., carbon reduction, leadership by example, and/or cost effectiveness)
 - Provide Lone Tree with information on available renewable energy programs through Xcel Energy to support staff in making informed decisions about priorities
- Conduct a gap analysis to understand the level of renewable energy needed to assess the feasibility of achieving the target beyond Xcel Energy's existing renewable energy mix on the electric grid, including any potential growth expected for municipal facilities
- Evaluate Lone Tree Arts Center and the Lone Tree Municipal Building to determine feasibility of on-site solar projects, utilizing outside contractors where appropriate. Determine if RFP process is needed to inform budget requests.
 - Include an assessment of system size and capacity against facility's electricity usage; structural assessment of the roof condition (e.g., ability to hold the weight of the solar system, and if condition is such that replacement is not expected for 10 years or more); and system design and funding strategy (including grants and other potential incentives).
 - Prepare budget requests based on feasibility assessment outcomes.
 - Lone Tree Arts Center may qualify for the Renewable Energy Trust

	<ul style="list-style-type: none"> • Submit any necessary budget request for an on-site solar project feasibility analysis by the end of Q2, 2022
2023 Q1-Beyond	<ul style="list-style-type: none"> • Complete the on-site solar feasibility study • Evaluate subscription-based program options for remaining facilities deemed unfeasible for on-site solar <ul style="list-style-type: none"> ○ Civic Center and Public Works Facility have been identified as likely targeted municipal facilities for renewable energy subscriptions • Enroll targeted municipal facilities in selected renewable energy subscription programs, depending on the results of the on-site solar feasibility study • Implement design and construction of on-site solar project(s)

Roles and Responsibilities

City Staff	<ul style="list-style-type: none"> • Public Works Department, Facilities Manager (Justin Russell) to lead feasibility assessment and management of renewable energy subscription programs • Arts Center Executive Director (Nicole Davies) to support feasibility assessment for Arts Center • Public Works Department, Facilities Manager (Justin Russell) to lead budget request submission process
Community Partners	<ul style="list-style-type: none"> • Contractors to support on-site solar feasibility assessment, design, and construction • Park Meadows Mall (Whitney Miller & William Pollard) and Charles Schwab (Terry Smith) to share success stories related to their existing on-site solar
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to support technical gap analysis for evaluating renewable energy options and environmental impact (greenhouse gas reduction) • Partners in Energy to facilitate creating success stories from Lone Tree businesses, to assist in municipal action on renewable energy

Required Resources

- City staff time to coordinate on-site solar feasibility assessment, design, and construction (estimated 40 hrs.)
- City staff time to manage renewable energy subscription programs (estimated 18 hrs.)
- City budget for on-site solar feasibility assessment, design, and construction (TBD)
- City budget to enroll in renewable energy subscription programs (TBD)



Focus Area: Residents

The residential sector represents a significant opportunity to reduce energy consumption and save money in Lone Tree by impacting how residents view and consume energy. This focus area identifies ways to increase energy efficiency awareness and encourage energy efficient behaviors and home energy improvements by homeowners and renters.

R-1: Residential Energy Education

Description

Several no- and low-cost opportunities for residents to save energy and money are available with changes to behaviors and through Xcel Energy home audit programs, equipment rebates, renewable energy subscriptions, and other incentives. The purpose of this strategy is to educate residents about these opportunities and encourage participation in energy programs through a citywide education effort in coordination with business education efforts (see Strategy B-1).

Target Audience

Lone Tree households in buildings with fewer than five units (e.g., single-family homes, duplexes)

Target Outcome

- Reach 5,000 residents (34 percent of Lone Tree’s population) through all outreach activities by the end of June 2023
- Increase participation incrementally by 200 participants in residential energy efficiency programs by June 2023 from the 2020 baseline of 194 participants, including all residential strategy impacts
- Increase participation incrementally by 100 participants in renewable energy programs from the 2020 baseline of 475 to a total of 575 by the end of June 2023

Scope and Timeline

2022 Q1

- Develop outreach plan for 2022:
 - Develop branding (e.g., Lone Tree Saves) in coordination with business outreach efforts (Strategy B-1)
 - Develop key messages (e.g., cost savings, environmental impact)
 - Determine which City outreach channels to use (e.g., Timberlines e-newsletter, Lone Tree Voice newspaper, City social media accounts, website, events, permitting process)
 - Identify incentives to include (e.g., Specialty LED Kits)
 - Confirm roles for content creation and distribution
 - Develop timeline for distribution
 - Establish consensus on methods used to track outreach
- Develop outreach collateral based on outreach plan (e.g., flyers, social media graphics, newsletter text, videos)

2022 Q2-Q4	<ul style="list-style-type: none"> • Implement outreach plan through City outreach channels • Reach out to community partners (e.g., schools, City Council, Youth Commission, HOAs) that could support additional outreach <ul style="list-style-type: none"> ○ Work with Youth Commission and schools to identify creative educational activities to engage with youth ○ Provide HOAs with materials to distribute to residents ○ Provide City Council with materials to include in their announcements
2023 Q1-Q2	<ul style="list-style-type: none"> • Use the 2022 outreach plan and lessons learned to inform an outreach plan for 2023 • Develop outreach collateral • Implement outreach plan
Roles and Responsibilities	
City Staff	<ul style="list-style-type: none"> • Communications Department staff to lead outreach planning and implementation • Community Development Department (Kelly First) to share information through permitting process
Community Partners	<ul style="list-style-type: none"> • HOAs to distribute outreach materials to residents • Youth Commission and schools to collaborate on youth engagement activities • City Council to distribute outreach material to constituents • Lone Tree Sustainability Team (Carol Sorensen) to distribute outreach materials
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to support outreach plan development by sharing best practices from other communities • Partners in Energy to draft outreach collateral
Required Resources	
<ul style="list-style-type: none"> • City staff time for outreach planning and collateral review (estimated 12 hrs.) • City staff time for outreach plan implementation and tracking (estimated 65 hrs.) • City staff/volunteer time to support community outreach events (estimated 12-18 hrs.) • Partners in Energy budget for printing and some advertising costs • Giveaways (e.g., Specialty LED Kits) provided by Partners in Energy 	

R-2: Multifamily Property Outreach

Description	
<p>The purpose of this strategy is to encourage property owners, management companies, and HOAs to participate in Xcel Energy’s no-cost multifamily buildings program, which includes on-site assessments with energy experts to identify energy saving opportunities and resources and direct installations of energy saving measures.</p>	
Target Audience	
<p>Multifamily property owners, managers, and HOAs of older buildings with five units or more per structure</p>	
Target Outcome	
<ul style="list-style-type: none"> Engage with 15 of the estimated 20 multifamily properties in Lone Tree by the end of June 2023 Increase participation incrementally by 5 multifamily properties in Xcel Energy’s Multifamily Buildings Program and Income-Qualified Multifamily Buildings Program from the 2020 baseline of 1 (to a total of 6 participants by June 2023) 	
Scope and Timeline	
2022 Q1	<ul style="list-style-type: none"> Gather a list of all multifamily property contacts from Code Enforcement, Police Department, and others Prioritize outreach based on existing relationships and age of the building (targeting older, less efficient buildings) Develop collateral to support outreach efforts
2022 Q2-Q3	<ul style="list-style-type: none"> Conduct direct outreach to priority properties through phone calls or in-person contact Send list of interested parties to Xcel Energy vendor for follow up
2022 Q4-2023 Q1	<ul style="list-style-type: none"> Continue outreach to additional properties Request participating properties share success stories
Roles and Responsibilities	
City Staff	<ul style="list-style-type: none"> Code Enforcement (Sam Waggener) to lead outreach coordination Police Department (Chris Cooper) to support outreach through existing programs
Community Partners	<ul style="list-style-type: none"> Corporate owners of multiple properties to share success stories
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> Partners in Energy to draft outreach materials and share best practices from other communities Xcel Energy vendor to provide follow-up support for interested properties
Required Resources	
<ul style="list-style-type: none"> City staff time for outreach planning and collateral review (estimated 12 hrs.) City staff time for conducting outreach (estimated 20 hrs.) Partners in Energy budget for collateral printing 	

R-3: Home Energy Squad Buy-Down Pilot Program

Description	
Xcel Energy’s Home Energy Squad program includes a visit from an energy expert to identify energy saving opportunities and install LED light bulbs, faucet aerators, weather stripping, and other energy saving items. This strategy focuses on exploring a pilot program for the City to subsidize the cost for residents to participate. If approved, this pilot program would involve a contract with the Home Energy Squad vendor and conducting outreach to promote resident participation.	
Target Audience	
Residents living in buildings with less than five units per structure	
Target Outcome	
<ul style="list-style-type: none"> Engage with 50 percent (1,500) single-family homes in Lone Tree by the end of June 2023 Increase participation incrementally by 75 residences (5 percent of single-family homes engaged) in Xcel Energy’s Home Energy Squad Program from the 2020 baseline of 3 for a total of 78 participants by June 2023 	
Scope and Timeline	
2022 Q1	<ul style="list-style-type: none"> Gather examples from other communities that have conducted a similar campaign, including details on costs, outreach efforts, and participation increases
2022 Q3	<ul style="list-style-type: none"> Prepare an information packet for City Council to explore their interest in funding a pilot buy-down program in 2023 Pending City Council approval, prepare and submit a budget request for pilot buy-down program
2022 Q3-Q4	<ul style="list-style-type: none"> Pending City Council approval, contract with Xcel Energy’s vendor for a pilot buy-down program Pending City Council approval, develop an outreach plan and outreach collateral to promote participation
2023 Q1 and beyond	<ul style="list-style-type: none"> Pending City Council approval, launch outreach to promote participation Track program participation and savings to inform potential future buy-down programs
Roles and Responsibilities	
City Staff	<ul style="list-style-type: none"> Community Development Department (Kelly First) to lead exploration and any necessary budget requests and contracting Communications Department staff to lead any necessary outreach
Community Partners	<ul style="list-style-type: none"> HOAs, Youth Commission, and schools to support outreach to residents
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> Partners in Energy to provide examples from other communities, support any necessary contracting, support outreach plan development, develop any necessary co-branded collateral, and facilitate tracking of results

- Xcel Energy vendor to lead any necessary contracting and tracking of results outside of normal Partners in Energy implementation data support

Required Resources

- City staff time to prepare information for City Council and support any necessary budget requests, contracting (estimated 8 hrs.)
- City staff time to conduct any necessary outreach (hours included in R-1 outreach)
- City budget to buy down the program for 75 residents (\$3,750)



Focus Area: Businesses and Institutions

Although it has far fewer total customers than the residential sector, businesses and institutions consume the majority of energy used in Lone Tree. This focus area engages businesses, to encourage participation in energy saving programs and help businesses become more sustainable.

B-1: Business Energy Assessment Outreach

Description

The purpose of this strategy is to encourage business participation in Xcel Energy’s no- or low-cost business energy assessment programs. These programs include on-site assessments with energy experts, to help businesses identify energy saving opportunities and resources as well as direct installations of energy saving measures. These efforts would be done in coordination with residential education efforts (see Strategy R-1).

Target Audience

- Business owners / facility managers
- Commercial property owners / facility managers

Target Outcome

- Engage with 400 businesses through outreach by the end of June 2023
- Increase annual participation in business energy assessment programs from the 2020 baseline of 0 to 20 by June 2023 and encourage each business to complete one recommended upgrade

Scope and Timeline

2022 Q1

- Develop outreach plan for 2022:
 - Develop branding (e.g., Lone Tree Saves) in coordination with residential outreach efforts (Strategy R-1)
 - Identify target audiences (e.g., building size, business type) to help focus outreach planning
 - Determine key Lone Tree events to reach target audiences
 - Develop key messages (e.g., cost savings, property value)
 - Identify additional resources to support participation (e.g., County business grants)

	<ul style="list-style-type: none"> ○ Determine which outreach channels to use (e.g., social media, website, Green Business breakfasts, permitting process, transit ads, business association meetings) ○ Confirm roles for content creation and distribution ○ Develop timeline for distribution ○ Establish consensus on methods used to track outreach ● Develop co-branded outreach collateral (e.g., flyers, social media graphics, newsletter text, videos)
2022 Q2-Q4	<ul style="list-style-type: none"> ● Implement outreach plan ● Reach out to community partners that could support additional outreach <ul style="list-style-type: none"> ○ Leverage South Denver Metro Chamber of Commerce to identify outreach channels and events, to utilize and raise awareness about available programs including the Business Energy Assessment programs ○ Collaborate with Lone Tree Sustainability Committee to develop small business contacts
2023 Q1 and beyond	<ul style="list-style-type: none"> ● Use the 2022 outreach plan and lessons learned to inform an outreach plan for 2023 ● Develop co-branded outreach collateral ● Implement outreach plan
Roles and Responsibilities	
City Staff	<ul style="list-style-type: none"> ● Communications Department staff to lead outreach planning and implementation ● Community Development Department (Kelly First) to share information through permitting process ● Economic Development Department (Jeff Holwell) to share information through interactions with businesses and identify potential businesses to act as liaisons, to encourage other businesses to participate, and to identify key Lone Tree events ● Building Division (Matt Archer) to identify larger buildings, using list of buildings that includes their square footage
Community Partners	<ul style="list-style-type: none"> ● South Denver Metro Chamber of Commerce (Jeff Keener) to support outreach ● Douglas County Community Development to help connect businesses to funding resources ● Charles Schwab (Terry Smith) to share success stories to encourage other businesses to participate ● Park Meadows Mall (Alex Cover) to coordinate on business assessment opportunities for tenants ● Lone Tree Boards and Commissions to support outreach ● Lone Tree Sustainability Team (Carol Sorensen) to support outreach to small businesses
Xcel Energy	<ul style="list-style-type: none"> ● Partners in Energy to support outreach plan development and share best practices from other communities

Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to draft outreach collateral • Partners in Energy to help plan and staff up to two events during implementation • Xcel Energy vendor to provide follow-up support to interested properties • Xcel Energy account managers to help identify businesses that would share their experiences
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Required Resources

- City staff time for outreach planning and collateral review (estimated 12 hrs.)
- City staff time for outreach implementation and tracking (estimated 65 hrs.)
- Partners in Energy budget for collateral printing

B-2: Sustainable Business Program

Description

This strategy involves exploring the feasibility of a sustainable business program to provide support to and celebrate businesses that are working to increase their sustainability practices.

Target Audience

- Business owners
- Business employees

Target Outcome

- Have a feasibility study completed by the end of 2023 for a possible future implementation of this program.

Scope and Timeline

2022 Q3-Q4	<ul style="list-style-type: none"> • Gather examples of sustainable business programs in other communities • Reach out to communities that have had successful and unsuccessful sustainable business programs to understand lessons learned • Reach out to the Colorado Green Business Network to understand how Lone Tree might leverage their program to promote sustainability in the business community
2023 Q1	<ul style="list-style-type: none"> • Interview businesses to understand what type of support and incentives would motivate them to participate • Reach out to partners (e.g., South Metro Denver Chamber of Commerce, Douglas County) to understand their interest in partnering on a sustainable business program.
2023 Q2	<ul style="list-style-type: none"> • Using the collected information, estimate the required staffing, community partners, and costs to support a sustainable business program in Lone Tree and present to City Council to determine next steps.

Roles and Responsibilities

City Staff	<ul style="list-style-type: none"> • Public Works Department and Community Development Department (Justin Russell and Kelly First) to lead exploration of City incentives and feasibility of sustainable business program • Finance Department (Ulli Nierling & Heather Lunde) to support exploration of City incentives and sustainable business program feasibility • Economic Development (Jeff Holwell) to lead coordination with partners and support the feasibility study • Police Department (Chris Cooper) to support business outreach to better understand business needs
Community Partners	<ul style="list-style-type: none"> • Colorado Green Business Network framework to support feasibility study • South Denver Metro Chamber of Commerce (Jeff Keener) to support feasibility study • Douglas County Community Development to support feasibility study • Charles Schwab (Terry Smith) to share success stories and other insights to inform the feasibility study • Lone Tree Boards and Commissions to support business outreach to better understand business needs • Lone Tree Sustainability Team (Carol Sorensen) to support business outreach to better understand business needs
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to support coordination with other communities, business outreach, and exploration of the Colorado Green Business Network framework for a Lone Tree sustainable business program • Xcel Energy account managers to support business outreach to better understand business needs

Required Resources

- City staff time for program feasibility assessment (estimated 24 hrs.)



Focus Area: New Construction

Lone Tree’s is expected to more than triple its current population over the next 20 years, which presents an enormous opportunity to save on energy costs and reduce greenhouse gas emissions by incorporating energy efficiency and renewable energy into construction. Lone Tree currently uses the 2018 International Energy Conservation Code and Amendments and is planning to update its code in 2023. This strategy focuses on identifying ways Lone Tree can further promote sustainable construction by engaging the development community and ensuring the code update includes considerations that advance renewable energy, EVs, and other advanced energy concepts in Lone Tree.

N-1: Targeted Developer and Builder Outreach

Description

Many developers and builders may already use sustainable energy practices during construction, and others may be unaware of the benefits and resources associated with energy efficiency and renewable energy, and available Xcel Energy new construction programs. This strategy involves conducting direct outreach (e.g., one-on-one interviews, focus groups) with Lone Tree's major developers and builders to better understand current practices and encourage sustainable energy practices.

Target Audience

- Major developers and builders

Target Outcome

- Engage 2 commercial developers and 2 residential developers in Lone Tree through direct outreach by the end of 2023

Scope and Timeline

2022 Q1	<ul style="list-style-type: none"> • Develop outreach strategy <ul style="list-style-type: none"> ○ Review the Partners in Energy New Construction & Redevelopment Toolkit ○ Identify major developers and builders (e.g., Shea Homes, Kiewit) ○ Develop key messages (e.g., How are you being sustainable? Do you know about these resources?) ○ Determine outreach channels for direct outreach (e.g., one-on-one interviews) ○ Identify opportunities to collect feedback and share information through development review process (e.g., initial consultation) ○ Develop timeline for implementation
2022 Q2	<ul style="list-style-type: none"> • Develop co-branded outreach materials (e.g., handouts, sample comment language) • Train staff to support outreach
2022 Q3-2023 Q2	<ul style="list-style-type: none"> • Implement outreach strategy and use results to inform outreach with other developers and builders

Roles and Responsibilities

City Staff	<ul style="list-style-type: none"> • Community Development Department (Kelly First) to lead outreach
Community Partners	<ul style="list-style-type: none"> • Thrive Home Builders (Jay Garcia) to share success stories • Lone Tree Planning Commission (Sydney Gieser) to support outreach strategy • South Metro Fire and Southgate Water and Sanitation to potentially collaborate on outreach
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Partners in Energy to develop outreach materials that can be easily updated as new resources become available • Xcel Energy New Construction Program Staff to provide program support

Required Resources

- City staff time for outreach planning and collateral review (estimated 4 hrs.)
- City staff time for outreach implementation (estimated 8 hrs.)
- Partners in Energy budget for printing

N-2: Sustainable Energy Construction Guidelines and Codes

Description

Incorporating energy efficiency, renewable energy, and EV considerations into City codes and guidelines for new construction can realize energy savings up front and avoid costly retrofits. This strategy focuses on incorporating sustainable energy considerations during code updates by leveraging existing regional and state resources and by promoting Xcel Energy new construction programs to help businesses meet code requirements and achieve savings.

Target Audience

- Developers, builders, and other contractors involved in new construction or redevelopment projects

Target Outcome

- Increase annual participation in Xcel Energy’s Energy Design Assistance and Energy Efficient Buildings programs from the 2020 baseline of 2 to 4 by June 2023

Scope and Timeline

2023 Q1-Q2	<ul style="list-style-type: none"> • Leverage resources from Xcel Energy, SWEEP, and the Colorado Energy Office to support the building energy code update process, including EV considerations • Review parking and zoning policies to support EV readiness
2023 Q3 and beyond	<ul style="list-style-type: none"> • Develop and distribute outreach materials to promote benefits and support compliance with code changes; connect developers and builders to supportive programs, including Xcel Energy’s new construction programs

Roles and Responsibilities

City Staff	<ul style="list-style-type: none"> • Community Development Department (Kelly First) to lead
Community Partners	<ul style="list-style-type: none"> • SWEEP to provide support for EV-ready codes • Colorado Energy Office (CEO) to provide support for energy codes • South Metro Fire and South Gates Water and Sanitation to potentially help distribute outreach collateral • South Denver Metro Chamber of Commerce (Jeff Keener) to distribute outreach collateral
Xcel Energy Partners in Energy	<ul style="list-style-type: none"> • Xcel Energy (Hope Medina) to provide support for building code updates and help share information with Council • Xcel Energy New Construction Program Staff to provide program support • Partners in Energy to support development of outreach collateral

Required Resources

-
- City staff time to coordinate with partners for energy code support (estimated 8 hrs.) – this is in addition to staff time required for the overall code update process
-

Energy Action Plan Impact

Over the next 18 months, the combined targets and strategies outlined in this plan will result in the following savings (Table 6).

Table 6: Energy Action Plan Impact

Metric	Baseline (18-month)	Incremental Impact	Total
Program Participation	874	349	1,223
Electricity Savings (kWh)	5,394,000	2,198,000	7,592,000
Natural Gas Savings (therms)	56,000	55,500	111,500
Renewable Electricity (kWh)	6,142,000	1,361,000	7,503,000
Greenhouse Gas Emissions Savings (MTCO₂e)	5,389	1,764	7,153
Energy Cost Savings (\$)	\$513,400	\$250,700	\$764,100

HOW WE STAY ON COURSE



This Energy Action Plan is a living document and all measures included in this plan are subject to the approvals of the City Manager and City Council. This section outlines how Lone Tree will assess and refine its goals and strategies based on community capacity and data.

Energy Action Team

An Energy Action Team will be formed to support implementation by attending applicable implementation check-in calls and serving as liaisons to the rest of the community. Check-in calls will be used for strategy implementation coordination and discussion progress towards goals. Energy Action Team commitments are more clearly outlined in each strategy. A summary of the roles and timeline of the plan strategies are provided in Table 7.

Table 7: Summary of Strategy Roles and Timeline

TASK	LEAD	Tentative Timeline						
		Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Beyond
M-1: Municipal Facility Energy Assessments & Improvements								
Audit Process	Public Works (Justin R.)	█	█					
Budget Request	Public Works (Justin R.)		█					
Project Implementation	Public Works (Justin R.)			█	█	█	█	
M-2: Renewable Electricity for Municipal Facilities								
Technical Gap Analysis	Partners in Energy	█						
Feasibility Assessment	Public Works (Justin R.)	█	█					
Budget Request	Public Works (Justin R.)		█					
Renewable Energy Subscriptions	Public Works (Justin R.)			█	█			
On-Site Solar Projects	Public Works (Justin R.)					█	█	█
R-1: Residential Energy Education								
Outreach Planning	Communications staff	█				█		
Collateral Development	Partners in Energy	█				█		
Outreach Plan Implementation	Communications staff		█	█	█		█	█
R-2: Multifamily Outreach								
Property Identification	Code Enforcement (Sam W.)	█						
Collateral Development	Partners in Energy	█						
Targeted Outreach	Code Enforcement (Sam W.)		█	█	█	█		
General Outreach	Code Enforcement (Sam W.)		█	█	█	█		
R-3: Home Energy Squad Buy-Down Pilot Program								
Information Gathering	Community Dev. (Kelly F.)	█						
Council Approval/Budget Request	Community Dev. (Kelly F.)		█					
Contracting	Community Dev. (Kelly F.)			█				
Outreach Plan	Communications staff				█			
Outreach Plan Implementation	Communications staff					█	█	█

		Tentative Timeline						
		Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Beyond
TASK	LEAD							
B-1: Business Energy Assessment Outreach								
Outreach Planning	Communications staff	■				■		
Collateral Development	Partners in Energy	■				■		
Outreach Plan Implementation	Communications staff		■	■	■		■	■
B-2: Sustainable Business Program								
Feasibility Assessment	Public Works (Justin R.), Community Dev. (Kelly F.), and Economic Development (Jeff H.)			■	■	■	■	
N-1: Targeted Developer and Builder Outreach								
Outreach Strategy	Community Dev. (Kelly F.)	■						
Collateral Development	Partners in Energy		■					
Staff Training	Community Dev. (Kelly F.)		■					
Outreach Strategy Implementation	Community Dev. (Kelly F.)			■	■	■	■	
N-2: Sustainable Energy Construction Guidelines								
Code Update	Community Dev. (Kelly F.)					■	■	
Outreach for Code Update	Community Dev. (Kelly F.)							■

Data and Reporting

Partners in Energy will provide biannual (twice-a-year) progress reports with metrics of success and overall progress toward plan goals and targets (Table 8). These reports will be shared with both the community and Energy Action Team.

Table 8: Goal and Targets Tracking Summary

Focus Area	Municipal Operations	Residents	Businesses and Institutions	New Construction	Total (Incremental)
Incremental Participation Target (# of Participants)	9	300	38	2	349
Incremental Carbon Reduction Target (MTCO_{2e})	633	352	313	467	1,765
Other Metrics to Track	Energy Savings, Renewable Energy	Energy Savings, Renewable Energy	Energy Savings	Energy Savings	--

APPENDIX A: STRATEGY LIBRARY

This appendix provides a library of additional strategy ideas that were identified throughout the planning process, but not prioritized for the first phase. These strategies are organized by focus area and are available for future consideration as capacity allows.

Municipal Operations

- Explore options for electrifying the municipal fleet.
- Increase opportunities for remote working, to reduce employees' greenhouse gas emissions.
- Provide eco-passes to employees using transit for commuting.

Residents

- Create materials to help residents navigate the process of getting solar installed at home.
- Create a resource library to support residents in completing their projects by connecting them to available resources or tips.
- Create an incentive program to encourage owners of apartment complexes to complete energy audits and make energy efficiency improvements.

Businesses and Institutions

- Work with Xcel Energy Account Managers to encourage large businesses to make energy improvements.
- Require businesses to publicly post who manages their facility, to support outreach efforts.
- Create a resource library to support businesses in completing their projects by connecting them with available resources or tips.

New Construction

- Share with developers and builders the cost-saving and environmental benefits of energy action in new construction. This could include organizing opportunities for experts to speak to the development community.
- Support neighbor-to-neighbor outreach to encourage sustainable energy practices in new home construction.

APPENDIX B: STRATEGY ACTION PLAN TEMPLATE

Description	
Target Audience	
Target Outcome	
Scope and Timeline	
202X Q1	
202X Q2- Q3	
202X Q4	
Roles and Responsibilities	
City Staff	
Community Partners	
Xcel Energy Partners in Energy	
Required Resources	
Other Notes	

APPENDIX C: BASELINE ENERGY ANALYSIS



Data was provided by Xcel Energy for all City of Lone Tree premises for 2018–2020. Xcel Energy provides electric and natural gas service to the community. The data helped the Energy Action Team understand the City of Lone Tree’s energy use along with identifying opportunities for energy conservation and renewable energy. Data included in this section establishes a baseline against which progress toward goals will be compared in the future.

Electricity and Natural Gas Consumption and Cost

Several Partners in Energy peer communities, including Centennial, Littleton, Englewood and Sterling Ranch, were selected to provide additional context for energy use in Lone Tree. Within the peer community group, Lone Tree uses the most energy per premise in both the C&I sector and the residential sector (

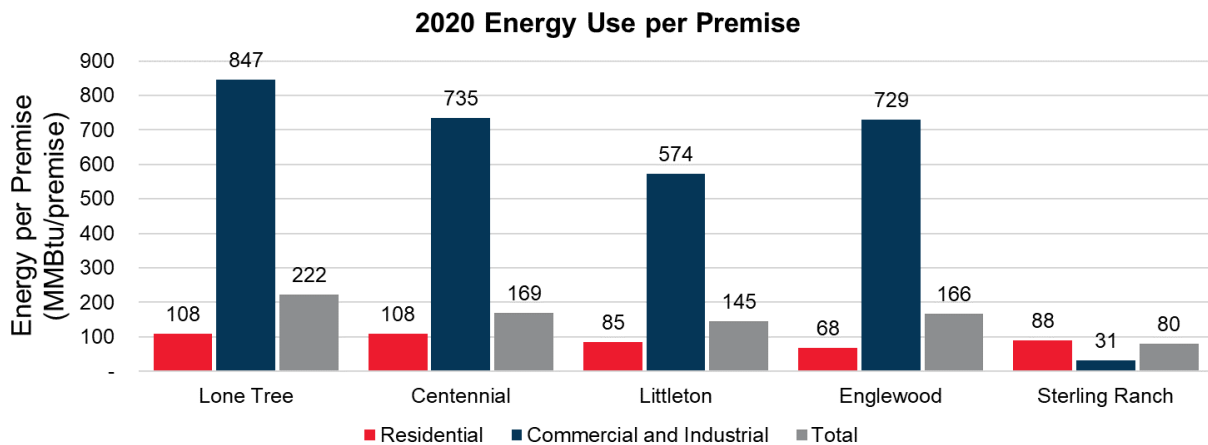


Figure 8). The high residential energy use in Lone Tree may be explained by home sizes, as Lone Tree residences have more rooms compared to other communities in the

peer group (U.S. Census Bureau, 2019). High C&I energy use in Lone Tree may be explained by the types of businesses located in Lone Tree, with energy intensive medical facilities as major employers and several energy intensive data centers located within city limits.

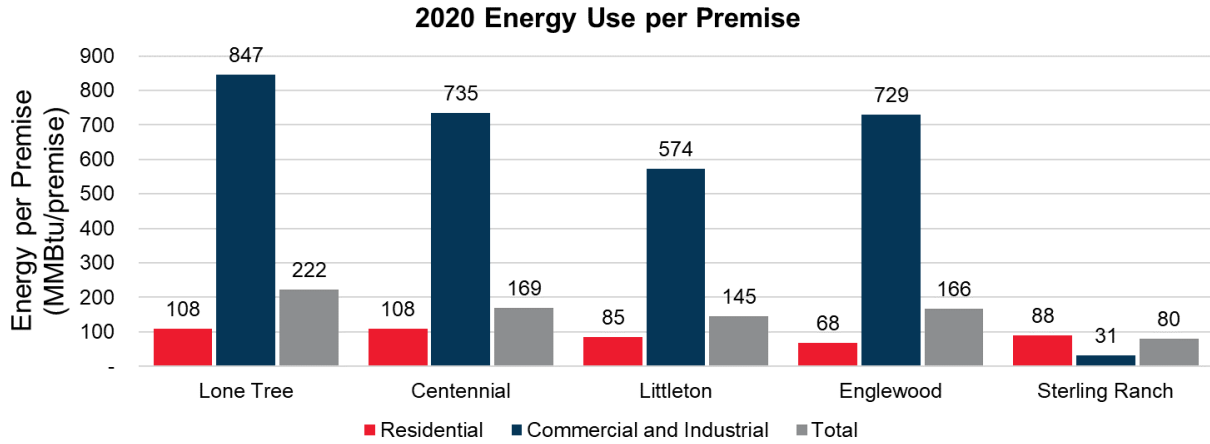


Figure 8. 2020 Energy Use per Premise by Sector for Lone Tree and Peer Communities

Over the last three years, electricity use has been on a downward trend, with 2020 use 4.5 percent lower than 2018 despite a 2.5 percent increase in community premises over the same time period (Figure 9). Some of the decrease in electricity use could be attributed to weather, with a milder summer in 2019 leading to lower need for air conditioning. Cooling Degree Days (CDD) are an indication of how warm the weather was (primarily during the summer). In 2020, a further decrease in electricity consumption from 2019 was driven by a decrease in the C&I sector, which is attributed to the COVID-19 pandemic stay-at-home orders and a number of business closures beginning in March 2020. This decrease in C&I sector electricity use was partially offset by a smaller increase in residential sector use.

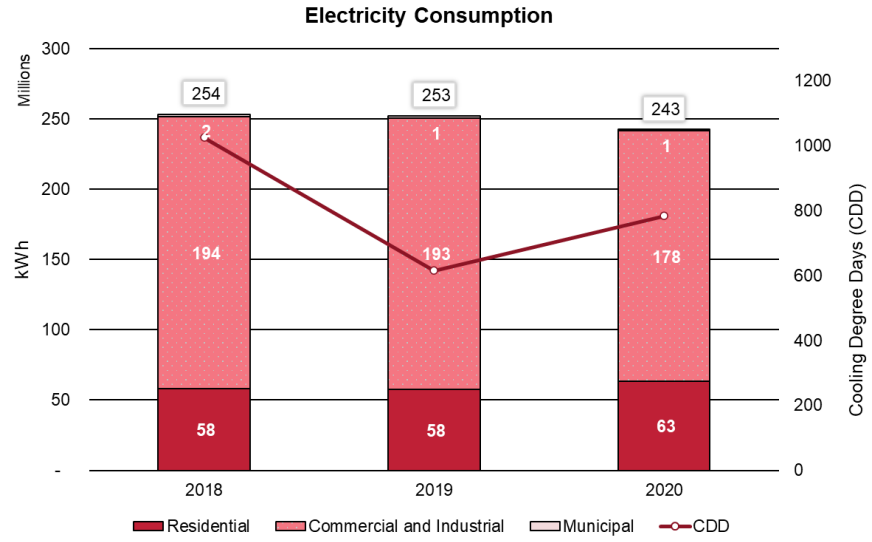


Figure 9. 2018-2020 Trend in Lone Tree Electricity Use by Sector (kWh)

Between 2018 and 2020, natural gas use fluctuated (Figure 10), as weather could be attributed as the largest driver of natural gas use across the community. Heating Degree Days (HDD) are an indication of the need for heating in the wintertime, and natural gas use in the community follows a similar trend of HDDs despite a 2.5 percent growth in premises over the same period. In 2020, some of the decrease in natural gas use from 2019 use can be attributed to a decrease in the C&I sector due to the COVID-19 pandemic that caused business closures beginning in March 2020.

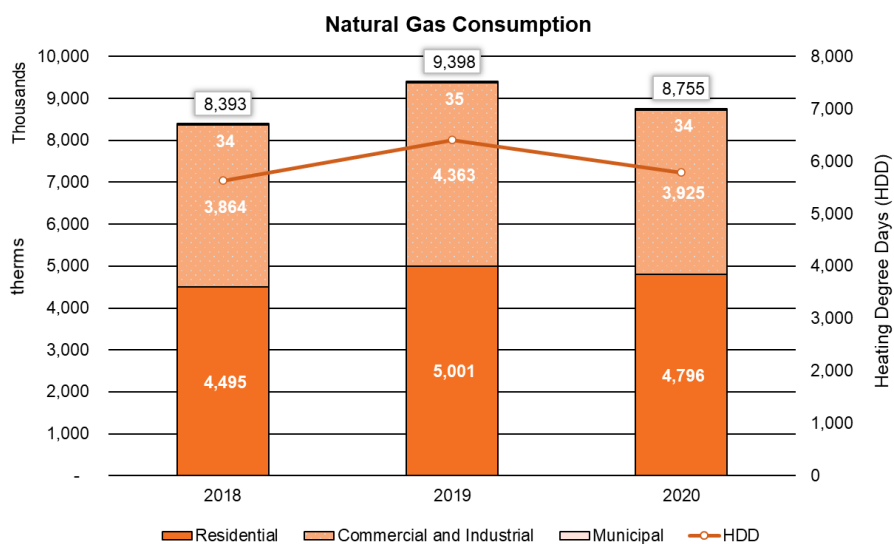


Figure 10. 2018-2020 Trend in Natural Gas Use by Sector (therms)

Greenhouse Gas Emissions and Trends

Building electricity and natural gas usage in Lone Tree contributes over 161 thousand metric tons of carbon dioxide equivalent (MTCO_{2e}) to total emissions. The scale of Lone Tree’s emissions is the same as the amount 35,000 standard passenger vehicles (EPA, 2021) would produce if they were driven for a full year. Well aligned with their overall energy consumption, C&I customers contribute 65% of greenhouse gases associated with stationary building energy use (Figure 11). Energy consumption-related greenhouse gas emissions have declined in Lone Tree over the past three years, despite total energy consumption fluctuating over the same time period (Figure 12, Figure 13). This finding is largely due to the “greening of the grid” or the process of adding more renewable energy supplies into the source fuel mix to support electricity generation.

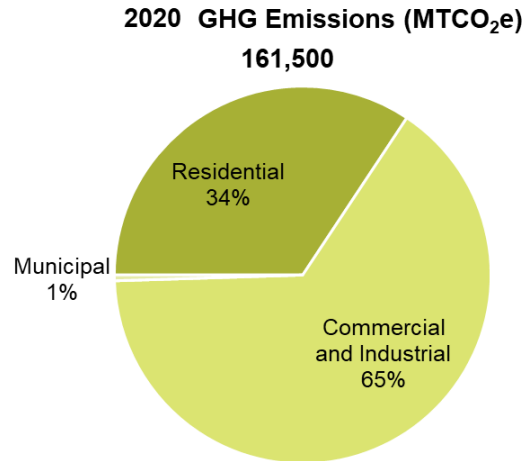


Figure 11. City of Lone Tree 2020 Greenhouse Gas Emissions by Sector

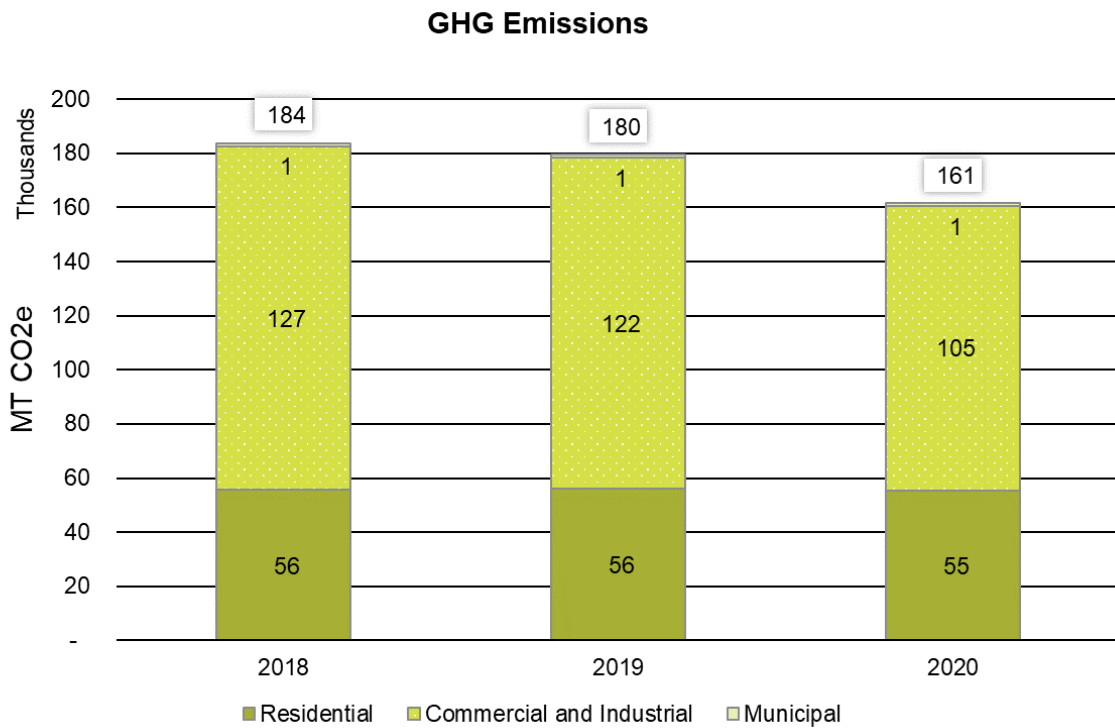


Figure 12. City of Lone Tree 2018-2020 GHG Emissions by Sector

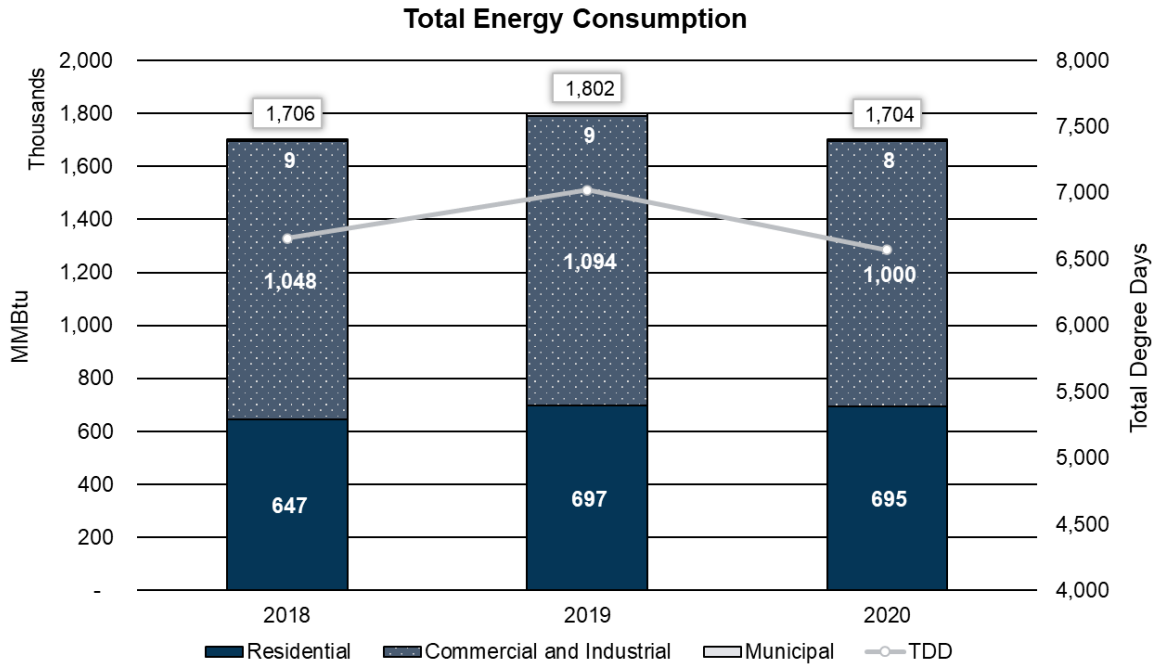


Figure 13. City of Lone Tree 2018-2020 Energy Consumption by Sector

Program Participation and Savings

Many energy programs are available to help residents and businesses reduce their energy use, reduce their utility costs, and increase the portion of their energy sourced from renewable electricity sources. In 2020, energy efficiency programs saved Lone Tree customers \$342,000 (Figure 14). C&I participants made up 27% of total program participants (Figure 15), but received 95% of cost savings, for an average energy cost savings of almost \$4,500 per participant. Residential participants made up 73% of total program participants, but only received 5% of cost savings, for an average energy cost savings of \$86 per participant.

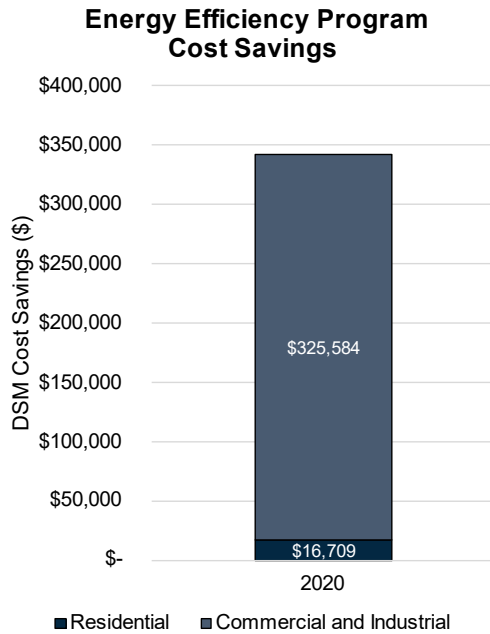


Figure 14. City of Lone Tree 2020 Energy Program Cost Savings by Sector

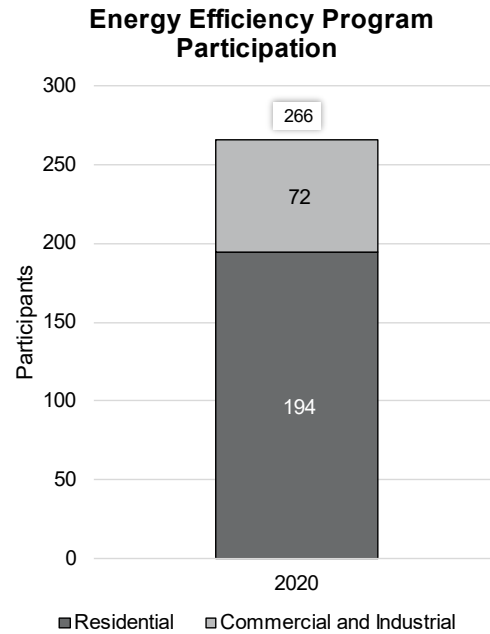


Figure 15. City of Lone Tree 2020 Energy Program Participation by Sector

In general, participation tends to ebb and flow with economic conditions, but lighting programs and cooling rebates have been most popular over the past three years for businesses and other commercial entities (Figure 16). Residential participation over the last 3 years has focused on equipment programs such as high efficiency air conditioning, residential heating, and refrigerator & freezer recycling (Figure 17). Lone Tree has an opportunity to both build on the success of these programs and increase participation in underutilized programs.

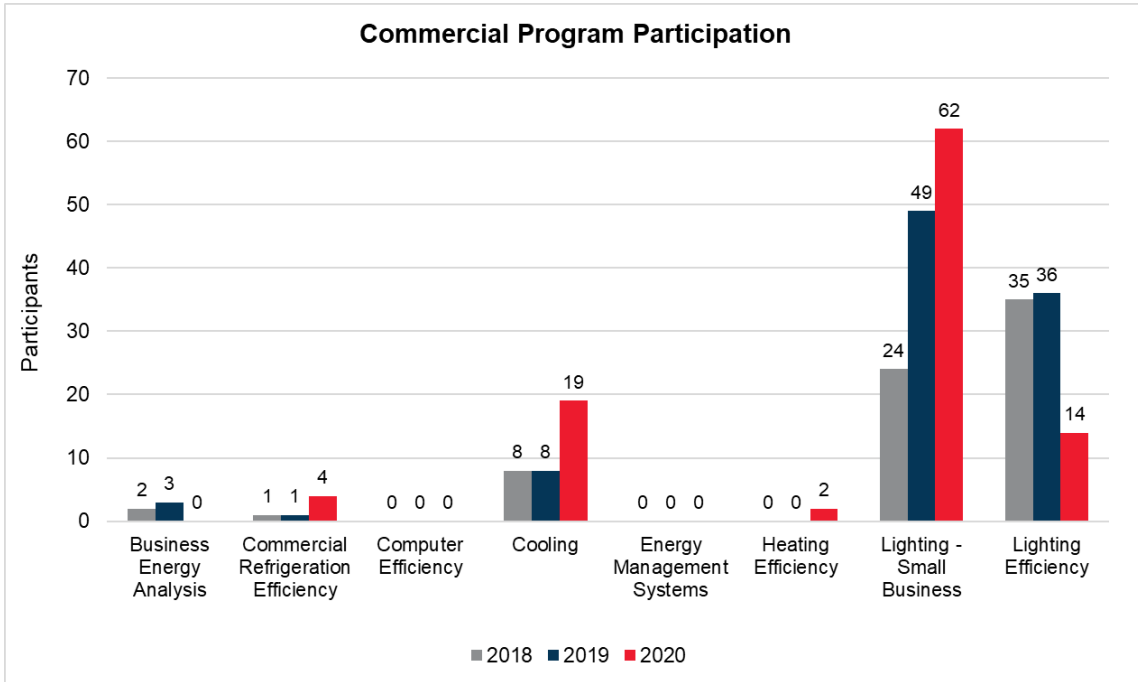


Figure 16. City of Lone Tree 2018-2020 Commercial Program Participation by Program

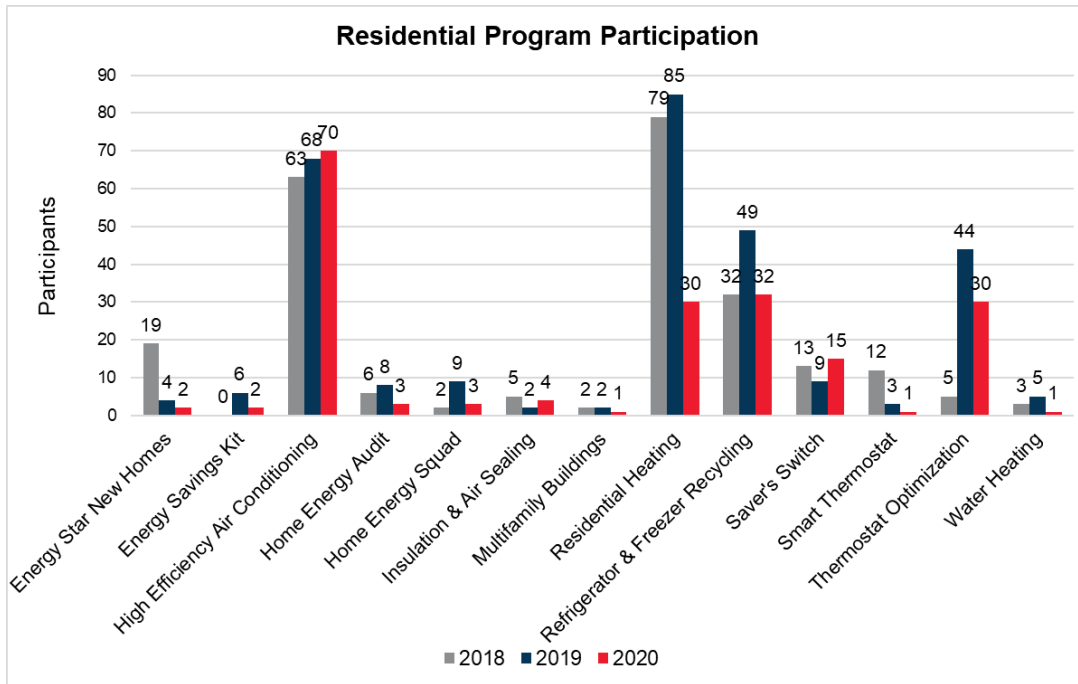
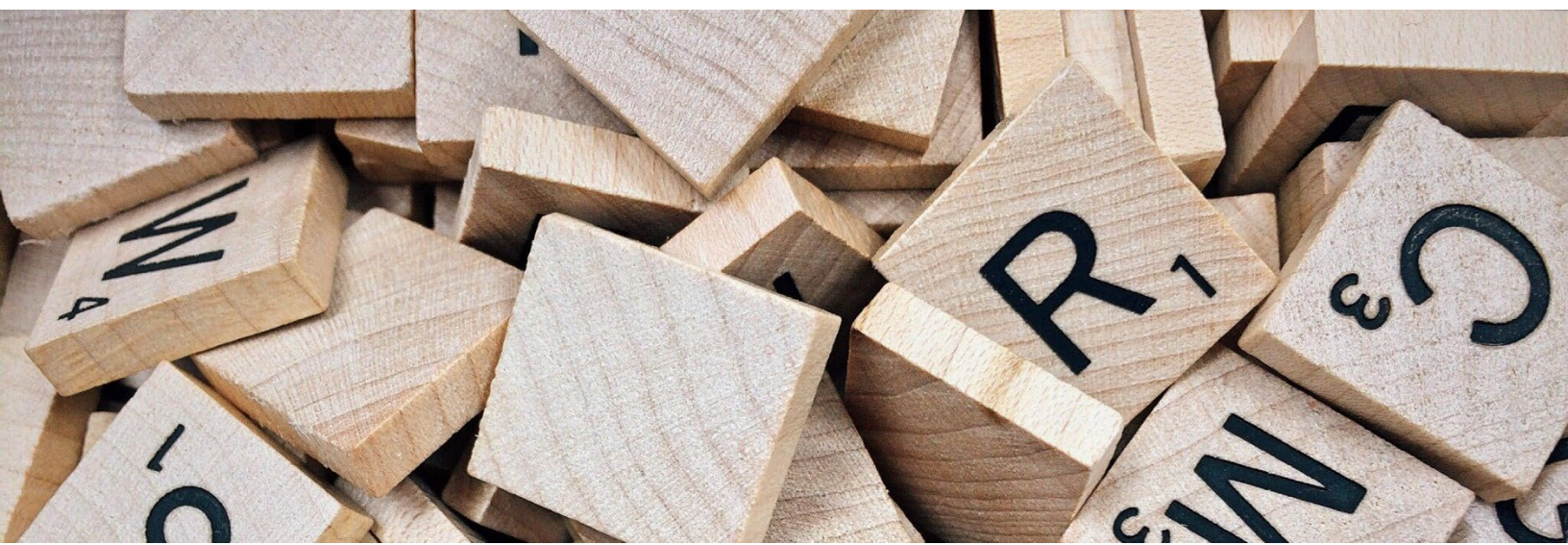


Figure 17. City of Lone Tree 2018-2020 Residential Program Participation by Program

APPENDIX D: GLOSSARY OF TERMS



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 percent of the total. Following these rules, if a premise is responsible for more than 15 percent of the total for that data set, it is are removed from the summary.

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

Carbon-free: Carbon-free refers to 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: 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. Carbon-neutral 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 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.

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

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

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

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

Energy Reduction: The result of behavior changes that cause less energy to be used. For example, setting the thermostat lower *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 percent less to keep your home at the same temperature (all things being equal), resulting in energy *savings* of X percent. For accounting purposes, energy savings are only counted in the year the new equipment is installed.

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

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

Kilowatt-hour (kWh): A unit of electricity consumption.

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

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

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

Premise: A unique 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; for a larger business, it is a separately-metered portion of the business's load at that address.

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

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

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

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

Therm (thm): A unit of natural gas consumption.

Trade Partner: Trade Partners, also known as Trade Allies or Business Trade Partners, are vendors and contractors who work with business and residential customers in 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.

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