










Climate Action Strategies

City of Sonoma

November 2023

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What Can You Do?

LOW CARBON TRANSPORTATION	
	<ul style="list-style-type: none"> • Drive an all-electric, plug-in hybrid, or 100% green hydrogen vehicle. • Bike, walk, carpool, or take public transit whenever possible. • Reduce commuting miles by working from home. • Shut your vehicle off when waiting at the school pick up/drop off lane.
RENEWABLE ENERGY & LOW CARBON ELECTRICITY	
	<ul style="list-style-type: none"> • Switch to Sonoma Clean Power's EverGreen or CleanStart or PG&E's 100% Solar Choice programs. • Install a solar energy system and consider battery storage. • Replace natural gas-fired appliances with electric appliances. • Electrify your lawn care/landscaping equipment.
ENERGY EFFICIENCY	
	<ul style="list-style-type: none"> • Have an energy audit conducted for your home or business. • Consider heat pump technology for your heating, cooling, and hot water needs. • Replace lights with LED bulbs and turn them off when not in use. • Upgrade insulation, seal leaks, and install a programmable thermostat. • Purchase only Energy Star appliances and equipment.
WASTE REDUCTION	
	<ul style="list-style-type: none"> • Repair, repurpose, and reuse items. • Place all food scraps into the green organics container or compost them at home. • Donate extra food, used clothing, and housewares. • Avoid single-use plastics and bring your own bag.
WATER CONSERVATION	
	<ul style="list-style-type: none"> • Replace your lawn with drought-tolerant plants. • Install a drip irrigation system, program it to run early in the morning, and check it regularly for leaks. • Install low water flow faucets, showerheads, and toilets. • Install water-efficient dishwashers and washing machines.
CARBON SEQUESTRATION	
	<ul style="list-style-type: none"> • Plant appropriate trees that will also increase beneficial shade. • Continuously add compost to your soil. • Purchase local carbon offsets for airplane flights and vehicle trips. • Protect trees and replace them when necessary. • Consider "no-mow" areas for your landscaping.
COMMUNITY ENGAGEMENT	
	<ul style="list-style-type: none"> • Join a Climate Action Team, participate in Climate Action Commission meetings. • Calculate your carbon footprint and commit to making it smaller. • Have your business become prepare a Climate Transition Plan or become a Certified California Green Business.

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Appendix I. Environmental Emergency Resolution

Appendix II. Sonoma’s Climate Actions and Data as of April 2020

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List of Acronyms

AMI - Advanced Metering Infrastructure
CAC – Climate Action Commission
CSEC – Community Services and environment Commission
CAS – Climate Action Strategies
CBSM – Community Based Social Marketing
CCA – Community Choice Aggregator
CER – Climate Emergency Resolution
CO₂ – Carbon dioxide
CO₂/MWh - Carbon dioxide per 1,000 kilowatt hours of electricity consumption
CSEC – Community Services and Environment Commission
EV – Electric vehicle
Ft – Feet
GHG – Greenhous gas(es)
HOA - Homeowner association
IPCC – Intergovernmental Panel on Climate Change
JCAS – Joint Climate Action Subcommittee
JPA – Joint Powers Authority
LB – pound
L1 – Level 1 EV charger
L2 – Level 2 EV charger
L3 – Level 3 EV charger
JCAS – Joint Climate Action Subcommittee
MSW – Municipal Solid Waste
MTCO_{2e} - metric tons of carbon dioxide equivalent
O&M – Operation and maintenance
PACE – Property Assessed Clean Energy
PG&E – Pacific Gas and Electric Company
PV – Photovoltaic
RPCA – Regional Climate Protection Authority
SCEIP – Sonoma County Energy Independence Program
SCP – Sonoma Clean Power
SCT – Sonoma County Transit
SCTA – Sonoma County Transportation Authority
V2G – Vehicle-to-grid
V2H – Vehicle-to-home
VMT – Vehicle Miles Travelled
ZNE/C – Zero Net Energy/Carbon
ZWS – Zero Waste Sonoma

Executive Summary

The City of Sonoma’s Climate Action Strategies (CAS) are designed to reduce greenhouse gas (GHG) emissions from community activities and city government operations. This CAS provides a roadmap and list of recommended and priority actions to achieve the city’s GHG emissions reduction target of net zero GHG emissions by 2030. The recommended actions in this CAS are also designed to achieve multiple co-benefits such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life.

E-1 Sonoma’s GHG Emissions

The City of Sonoma’s 2020 GHG inventory (a) identifies the major sources and quantities of GHG emissions produced in Sonoma and (b) tracks the city’s progress in reducing its GHGs since 1990. In 2020, Sonoma emitted approximately 75,085 metric tons of carbon dioxide equivalent GHG emissions (MT CO₂e). As shown in Figure ES-1, the categories of GHG emission sources are transportation (66.05%), buildings (27.69%), and solid waste (5.55%). Other minor categories are government operations (0.4%) and water and wastewater (0.26%). In 2020, Sonoma’s per capita GHG emissions were 7.0 MT CO₂e, third highest among Sonoma County’s jurisdictions and 20% higher than the per capita average (5.81 MT CO₂e) in Sonoma County.

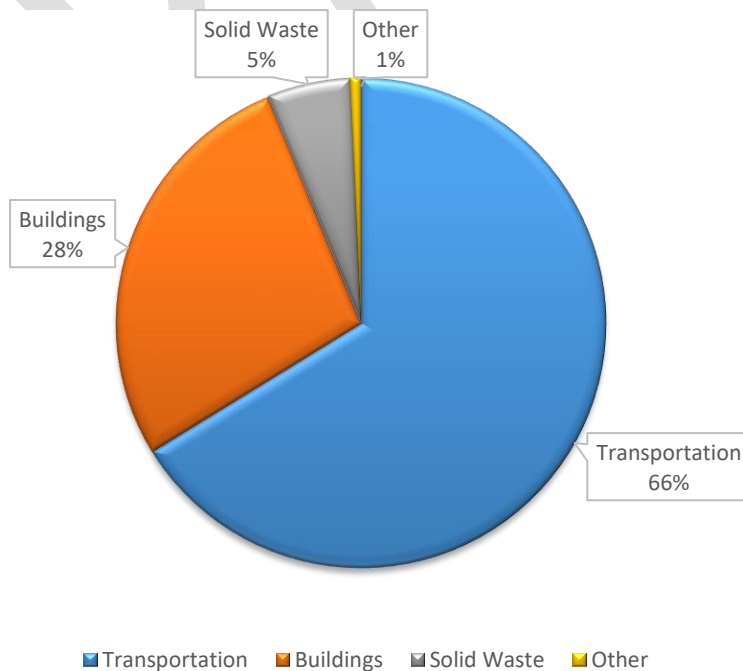


Figure ES-1. Sonoma’s communitywide GHG emissions, 2020.

E-2 GHG Emissions Reduction Target and Climate Actions

In 2020, the City Council adopted a target of net zero GHG emissions by 2030. Net zero refers to the state where GHGs released into the atmosphere are balanced by removal of carbon out of the atmosphere and captured and sequestered. To achieve this target, a three-prong climate action strategy is necessary: (1) a significant reduction of GHG emissions, (2) the generation of “excess” zero carbon electricity (PV solar) to compensate for remaining GHGs, and (3) the sequestration of atmospheric carbon.

To implement the three-prong strategy, the CAS presents a recommended variety of climate actions. The actions selected were based on their low cost/high reduction potential, have potential co-benefits, and have been successfully implemented by other jurisdictions. These actions are organized into the following GHG sources:

- Transportation,
- Buildings,
- Solid Waste,
- Water,
- Government Operations, and
- Carbon Sequestration.

E-3. Recommended and Priority Climate Actions

The top climate actions recommended for Sonoma to achieve the city’s GHG reduction target are presented below. The actions presented in *italics* are considered priority climate actions by the City of Sonoma’s Climate Action Commission¹.

Recommended and Priority Climate Actions	
Transportation	
Expand Bicycle and Pedestrian Infrastructure	<ul style="list-style-type: none"> • Prepare Master Plan for Bicycle and Pedestrian Infrastructure • Connect Sonoma City Trail to Plaza • Increase Downtown Bicycle Parking • Create Cool Corridors for Bicycle and Pedestrian Trails
Electrification of Personal Transportation	<ul style="list-style-type: none"> • Increase EV Charging at Multi-unit Dwellings. • <i>Expand Publicly Accessible EV Charging</i>
Improve Public Transportation	<ul style="list-style-type: none"> • <i>Establish an Electric Downtown Shuttle</i> • Expand the #32 Sonoma Shuttle

¹ At the April 12, May 31, and August 9, 2023, meetings of the CAC, the commission considered and voted to approve a list of priority climate actions.

Recommended and Priority Climate Actions	
Consider Ban on New Fossil-Fueling Stations	<ul style="list-style-type: none"> • Explore Banning Construction of New Fossil-Fuel Filling Stations
Reduce Idling	<ul style="list-style-type: none"> • Explore Banning New Drive Thru Windows
Buildings	
Reduce Reliance on Natural Gas	<ul style="list-style-type: none"> • Encourage Increased Electrification and Energy Efficiency in Residences and Commercial Buildings • Adopt All-Electric or Electric Preferred Reach Code
Increase Community Energy Efficiency	<ul style="list-style-type: none"> • Sponsor Lighting Efficiency Giveaway Events • Offer Energy Efficiency Workshops • Energy Benchmarking • Deploy Local Energy Conservation Teams
Expand PV Solar	<ul style="list-style-type: none"> • Increase Use of PV Solar
Explore Community Microgrids	<ul style="list-style-type: none"> • Explore Feasibility of Community Microgrids
Solid Waste	
Increase Organic Materials Segregation	<ul style="list-style-type: none"> • Offer Discounted Residential Backyard Composters • Update the Solid Waste Franchise Agreement • Increase Zero Waste Practices
Decrease Consumption of Plastic Shopping Bags	<ul style="list-style-type: none"> • Adopt Plastic Bag Ordinance • Enforce State Bag Fee Requirement
Reduce Single Use Plastic Water Bottles	<ul style="list-style-type: none"> • Increase the Number of Water-Bottle Filling Stations
Increase Use of Compliant Food Serviceware	<ul style="list-style-type: none"> • Increase Use of Compliant Items at Special Events • Enforce City's Ban on Disposable Food Serviceware
Water	
Reduce Use of Irrigation	<ul style="list-style-type: none"> • Expand and Modify the Cash for Turf Program • Encourage Use of Rainwater Capture Systems on Private and Public Properties • Prepare and Implement a Community Based Social Marketing Plan
Install Real Time Monitoring of Water Consumption	<ul style="list-style-type: none"> • Install Advanced Water Metering Infrastructure • Encourage Water Conservation by High Users
Government Operations	
Energy Conservation Measures in City Buildings	<ul style="list-style-type: none"> • Conduct Energy Conservation Audits • Replace Ineffective Window Sash Locks • Install Vacancy Lighting Sensors • Install HVAC Zones in City Hall and Carnegie Library
Upgrade and Expand PV Solar on City Buildings	<ul style="list-style-type: none"> • Upgrade Current PV Solar Arrays • Expand PV Solar on Municipal Buildings • Assess Potential Areas to Install PV Solar Parking Canopies • Explore Solar Battery Storage

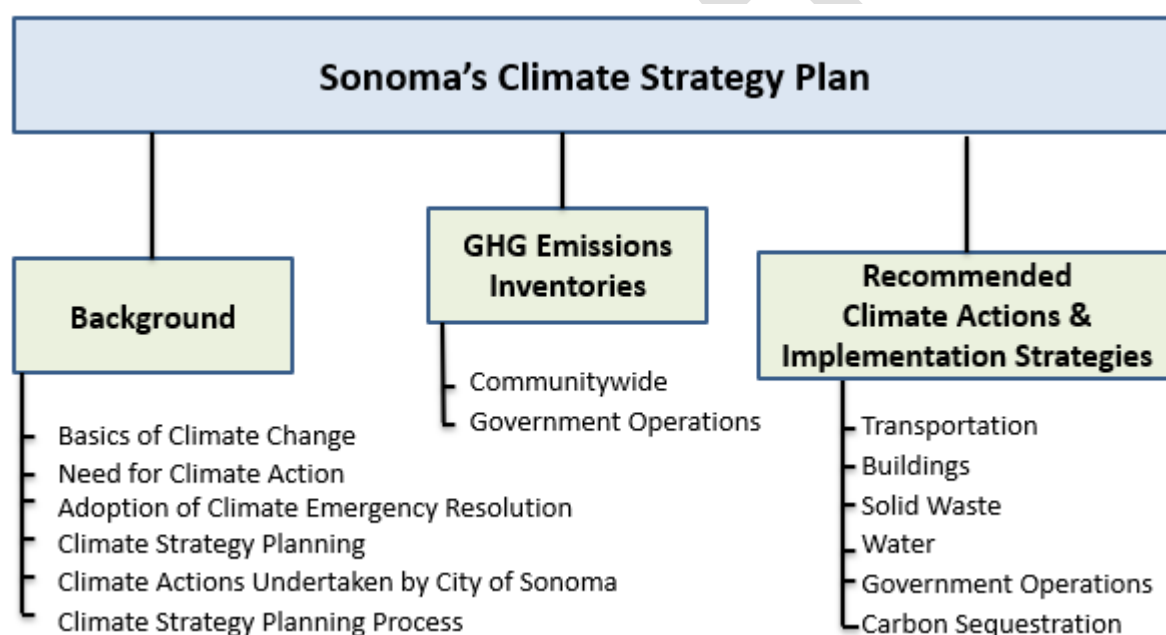
Recommended and Priority Climate Actions	
Electrification of City Vehicles and Equipment	<ul style="list-style-type: none"> • <i>Prepare City Fleet and Equipment Electrification Plan</i> • <i>Install EV Workplace Charging for City Employees</i>
Replace Natural Gas Fired Equipment at City Buildings	<ul style="list-style-type: none"> • <i>Replace Gas-Fired Water Heaters</i> • Replace Gas-Fired HVAC System at the Police Department
Carbon Sequestration	
Soil-Based Carbon Sequestration	<ul style="list-style-type: none"> • Expand the Application of Compost • <i>Explore Application of Biochar</i>
Increase Planting of Trees	<ul style="list-style-type: none"> • <i>Assess and Expand Urban Tree Shade Canopy</i> • <i>Install Green Pocket Forests</i> • Seek Tree City USA Designation
Local Carbon Offset Program	<ul style="list-style-type: none"> • Establish a Local Carbon Offset Program

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E-4 Organization of this Climate Action Strategies Document

As shown in Figure ES-2, the CAS builds on the many years of multiple environmental sustainability actions taken in the city, county, region, state, and nation. Community actions by city residents, businesses, and visitors to Sonoma are all necessary as we move ahead successfully. Each action envisioned in this document will build on all the other related efforts to achieve our critical goal.

Figure ES-2: Organization of Sonoma’s Climate Action Strategies.



E-5 Community Engagement

The overwhelming majority of GHG emissions in Sonoma are from the community, which prompts the following questions:

- How can the community best participate in Climate Strategy Planning?
- What actions does the community consider priority?
- What actions are possible and feasible for community-level implementation?

These are important questions to help build the foundations for impactful change. This means that the community needs to be involved in the formation and implementation of Sonoma’s CAS to ensure success in the coming years.

Enhancing awareness and building capacity is an essential foundation to the City’s approach to climate action. Community engagement brings together key community stakeholders and municipal decision-makers to shape the CAS. And, through community engagement, Sonoma’s community and government can collectively and collaboratively co-create a CAS that is equitable, actionable, effective, and sustainable.

DRAFT

1. Introduction

Goals:

- Understand the impacts of climate change and need for action.
- Examine Sonoma's climate actions to date.
- Develop a strategy for climate action.

The need for local governments in California to act on climate change is increasingly becoming more urgent as demonstrated by the recently extensive drought coupled with the devastating wildfires in 2017 and 2020 and serious flooding in 2017 and 2019. Sonoma has been an environmental leader, and the climate actions contained in this document continue this legacy by incorporating new approaches and ambitious targets to address climate change. The actions presented in this document outline a path towards reducing Sonoma's greenhouse gas emissions through the year 2030 and beyond.

1.1 Basics of Climate Change

Greenhouse gases (GHGs) are gases that trap heat within the Earth's atmosphere increasing surface and ocean temperatures². Although GHGs are naturally occurring, anthropogenic (human caused) emissions from burning fossil fuels, industrial processes, landfills, and raising livestock are responsible for the dramatic increase in the atmospheric concentration of GHGs. While we depend on a minimum concentration of GHGs to keep Earth habitable, certain human activities emit excessive quantities of GHGs that increase their concentration in the atmosphere to damaging levels that traps heat, resulting in an increase in Earth's average temperature.

Each year we experience the increasing deleterious effects of climate change locally, nationally, and globally with more volatile and unpredictable weather; record-breaking heat days, droughts and fires; storm surges and sea level rise; ecosystem degradation; species extinction; ocean warming and acidification; climate-related human deaths; and economic and demographic disruption.

² GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and ozone (O₃).

1.2 Need for Climate Action

According to the Intergovernmental Panel on Climate Change (IPCC), the United Nations' body for assessing the climate change science, human activities have already caused approximately 1.1°C of global warming above pre-industrial levels.³ The IPCC also estimates that global warming will likely reach 1.5°C between 2030 and 2052 if warming continues to increase at the current rate and may exceed this threshold. If so, this will result in potentially catastrophic effects.⁴

The ecological, social, and economic impacts to Sonoma Valley and the North Bay are significant, consequential, and innumerable—several of which we already face. A strong consensus is emerging in California, Sonoma County, and the City of Sonoma on the need to take effective and sustained action to reduce emissions of human produced GHGs, the major factor in human-caused climate change. Local governing bodies (including the City of Sonoma) have already adopted emergency climate resolutions; deciding how to act effectively and efficiently remains our primary challenge. Working together, we are making a difference for our collective future and future generations.

1.3 Adoption of Climate Emergency Resolution

In 2016, the Regional Climate Protection Authority (RCPA), published its Climate Action 2020 and Beyond⁵, setting out a regional framework for the entire Sonoma County community to reduce GHG emissions. This report's overarching goal was to present a plan to reduce GHG emissions 40% by 2020 compared to 1990 levels. By 2018, countywide GHG emissions had been reduced by only 13% below 1990 levels. While in 2020 GHG emissions decreased by 22.5% compared to 1990 levels, the inventory was conducted during the Covid-19 public health emergency. Consequently, it is likely that this dramatic drop was anomalous. The next GHG inventory will cover 2022 but will not be released by the RCPA until the spring 2024.

In September 2019, the RCPA released its model Climate Emergency Resolution (CER) for potential adoption by jurisdictions in Sonoma County. This model was the basis for the City of Sonoma's CER adopted on November 2, 2020 (Resolution No. 59-2020⁶). In this CER, the City Council committed to reduce the carbon footprints of both government operations and communitywide activities and established a target of net zero GHG emissions no later than 2030.

³ https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_SummaryForPolicymakers.pdf (p. SPM-7)

⁴ <https://www.ipcc.ch/sr15/chapter/spm/>

⁵ <https://rcpa.ca.gov/projects/climate-action-2020>

⁶ <https://www.sonomacity.org/documents/climate-emergency-resolution>

In April 2022, the City Council created the Climate Action Commission (CAC)⁷. Regarding the CAC, its charge includes acting in an advisory capacity to the City Council on the following:

- The development, updating, implementation, and communication of the city's Climate Action Plan;
- Policies and programs intended to implement provisions of the Climate Action Plan; and
- Policies and programs intended to preserve and enhance the natural environment.

In addition, the CAC is charged with presenting a GHG reduction scorecard annually to the City Manager prior to the adoption of the budget by the City Council.

1.4 Climate Actions Already Undertaken by City of Sonoma

Over the past 15 years, the city government has already taken many important actions in reducing GHG emissions. These include adopting and promoting low-carbon electricity, energy efficiency, renewable energy, low-carbon transportation, zero waste activities, and water conservation. (For a complete list of actions and accomplishments, refer to Appendix I - Sonoma's Climate Actions and Data as of April 2020.) Some of our city's major climate actions include:

- **September 2003**, the city completed its first municipal GHG Inventory.
- **August 2005**, the city set ambitious GHG reduction goals:
 - Communitywide: 25% below 1990 by 2015
 - Municipal: 20% below 2000 by 2010
- **February 2008**, the city adopted its first GHG Emissions Reduction Action Plan.
- **September 2010**, the city installed solar photovoltaic (PV) systems on its Police Station and the administrative building at the Corporation Yard.
- **July 2013**, the city joined Sonoma Clean Power's (SCP) Community Choice Aggregation (CCA) to increase consumption of low carbon electricity.
- **October 2016**, Sonoma was the first municipality in Sonoma County to adopt SCP's 100% renewable, low-carbon EverGreen electricity option for government operations.
- **November 2016**, the City Council adopted the 22 measures contained in the Regional Climate Protection Authority's (RCPA) Climate Action 2020 report.
- **June 2017**, Sonoma joined the Mayors' National Climate Action Agenda and reaffirmed its commitment to reducing communitywide GHG emissions to 25% below 1990 by the year 2020, and 80% below 1990 levels by 2050.
- **July 2017**, the city replaced 1,100 streetlights with energy efficient LED fixtures.

⁷ Prior to the creation of the CAC, climate action was under the purview of the former Community Services and Environment Commission (CSEC) and the Joint Climate Action Subcommittee (JCAS). In April 2022, the City Council dissolved the CSEC and the JCAS and created two new commissions: the Parks, Recreation, and Open Space Commission (PROS) and the CAC.

- **December 2019**, the city hired its first-ever, part-time Sustainability Coordinator with responsibilities that included climate action.
- **April 2020**, the city published a comprehensive report: *Sonoma's Climate Action and Environmental Sustainability Accomplishments* (see Appendix I).
- **May 2020**, the City Council adopted a work plan to implement specific climate and environmental sustainability actions.
- **October 2020**, the City Council adopted a resolution for Sonoma to achieve a goal of zero waste by 2030.
- **November 2020**, the City Council adopted a resolution declaring a Climate Emergency and set a target of net zero GHG emissions by 2030 and created the Joint Climate Action Subcommittee (JCAS).
- **April 2021**, the City Council adopted an ordinance that prohibits the use and sale of non-recycled and non-compostable single use food serviceware in Sonoma.
- **November 2021**, the City Council adopted an ordinance that mandates separation and collection of organics from the solid waste stream.
- **April 2022**, the City Council dissolved the JCAS and created the new five-member Climate Action Commission.
- **February 2023**, the first meeting of the new Climate Action Commission was held.
- **August 2023**, the CAC finalized its list of recommended priority climate actions that was presented to the community.
- **October 2023**, a community meeting was held to solicit comments on the draft climate strategies, which was coupled with a written public comment period.

1.5 Climate Action Strategy Planning Process

To achieve the net zero GHG emissions target, a CAS is needed. The CAS will serve as a framework to aid the city in responding to the climate emergency and reaching net zero GHG emissions by 2030. In this CAS, “net zero” refers to the state where GHGs released into the atmosphere are balanced by removal of carbon out of the atmosphere and captured and sequestered. This means that GHG emissions must be reduced to the greatest extent possible coupled with the capture and sequestration of carbon. Because there will still be GHG emissions remaining, carbon free energy (e.g., PV solar) will need to be produced to compensate for remaining GHG emissions. As shown in Figure 1-1, the City of Sonoma’s Climate Strategy Planning process consists of 6 major steps. This draft CAS reflects completion of Steps 1 through Step 3.



Figure 1-1: Steps in the city's climate strategy planning process.

1. **Inventory GHG Emissions** (*completed and ongoing*): An emissions inventory creates a baseline from which to measure progress in reducing GHG emissions. The most current emissions inventories cover government operations (2018) and communitywide emissions (2020)⁸.
2. **Establish Reduction Target** (*completed*): This step involves setting a target to identify how much emissions will be reduced and by when. In November 2020, the City Council

⁸ Communitywide emissions for 2022 are scheduled to be released in the spring of 2024.

set a target of net zero GHG emissions by 2030 for both government operations and communitywide.

3. **Identify Actions to Achieve Target** (*drafted*): This step involves identification of viable and feasible actions to achieve the reduction target. A recommended array of actions is presented in this document.
4. **Adopt Actions to Achieve Target** (*not completed*): Using the list of recommended actions, they need to be (1) evaluated based on relevant criteria including cost, effectiveness, technical and legal feasibility, timeline, and GHG emission reduction potential and (2) based on this evaluation, a prioritized list of actions needs to be adopted as part of the final CAS. The CAC reviewed the draft CAS and identified their priority climate actions to be recommended to the City Council.
5. **Implement Actions** (*not completed*): Based on the results of Step 4, the actions will be prioritized and request for funding will be submitted for the 2024-2025 fiscal year. Based on the need and availability of funding, the actions will begin to be implemented on an ongoing basis.
6. **Evaluate Actions** (*not completed*): As the actions are implemented, they need to be tracked, monitored, and evaluated to assess GHG reductions achieved, costs, co-benefits, technological issues, and barriers to determine if adjustments or modifications are necessary. This will require annual or biennial GHG emissions inventories.

As noted above, the city has completed Steps 1, 2, and 3. This draft CAS presents the list of identified actions and CAC recommended priority actions for consideration by the City Council. Upon the council's adoption, Step 4 will be completed, and additional actions will be implemented and evaluated. After the completion of the General Plan, the CAS will be reevaluated, and additional actions may be identified.

2. Inventory of Greenhouse Gas Emissions

Goals:

- Prepare an inventory and biennial updates of GHGs for Sonoma’s community.
- Identify the major sources and contributors to GHG emissions.
- Monitor progress of GHG emissions reductions.

Critical to developing actions to eliminate/reduce (mitigate) GHG emissions is to establish and maintain an inventory of GHG emissions. The inventory serves as a baseline and identifies the major sources of GHG emissions and documents progress toward the city’s target of no net GHG emissions by 2030. This document contains two separate baseline GHG inventories: communitywide and government operations.

2.1 Communitywide GHG Inventory

Presented in Table 2-1 and Figure 2-1 are the inventories of the City of Sonoma’s communitywide GHG emissions in five different periods from 1990 to 2020; these data include emissions from government operations.⁹ It is important to note that the significant decrease in total GHG emissions reported for 2020 were significantly impacted by the Covid-19 Public Health Emergency due primarily to reduced vehicle use, although its precise impact on GHG emissions has not been measured.

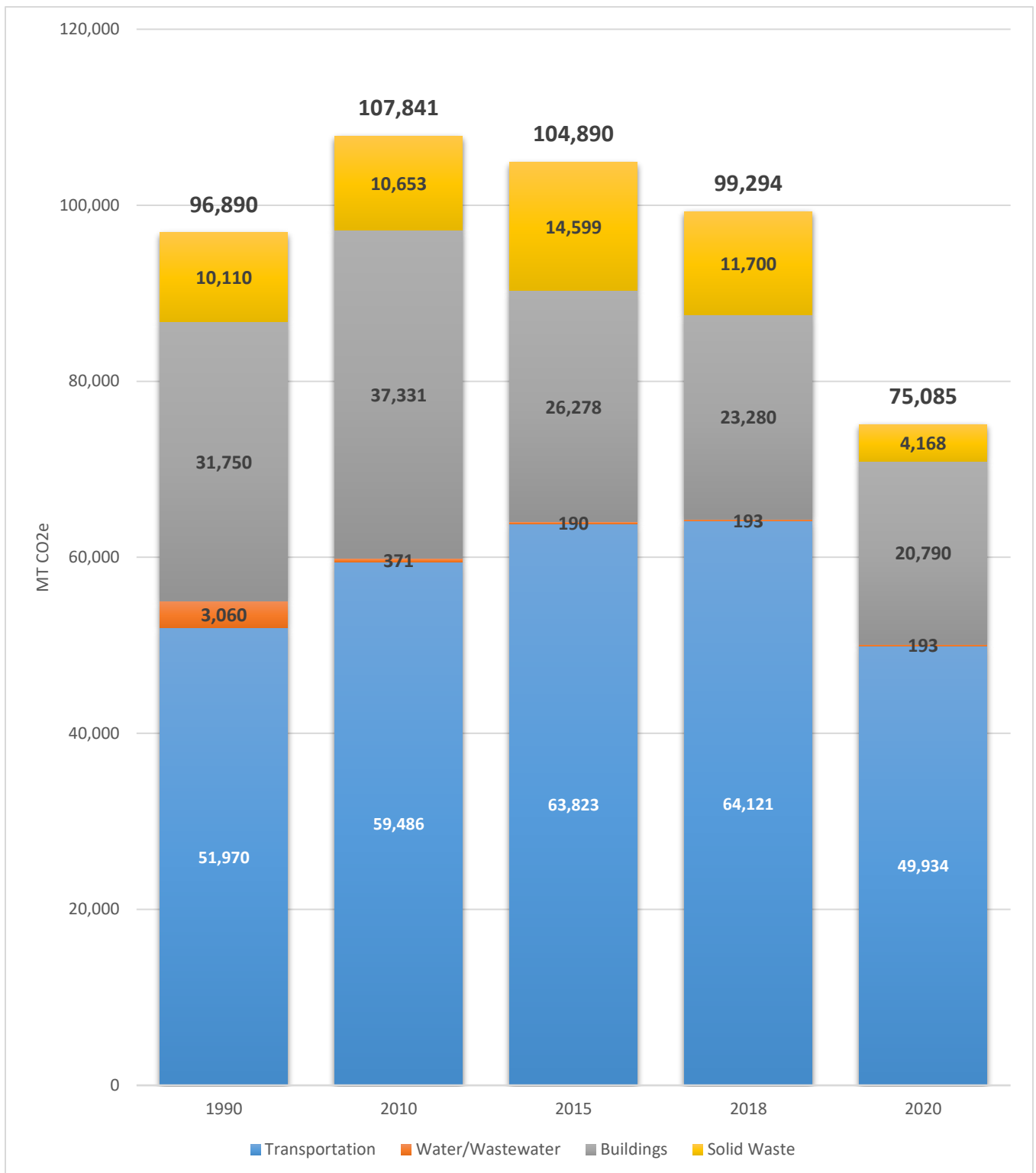
⁹ Sonoma County Greenhouse Gas Inventory: 2020 Update. Regional Climate Protection Authority, September 6, 2022.

Table 2-1: City of Sonoma's communitywide GHG emissions (MT CO₂e)¹⁰, 1990-2020.

Sector	1990	2010	2015	2018	2020	1990-2020 Change
Transportation	51,970	59,486	63,823	64,121	49,934	-4%
Buildings	31,750	37,331	26,278	23,280	20,790	-35%
Solid Waste	10,110	10,653	14,599	11,700	4,168	-59%
Water/Wastewater	3,060	371	190	193	193	-94%
Total	96,890	107,841	104,890	99,294	75,085	-22.5%

¹⁰ The unit MTCO₂e refers to metric tons of carbon dioxide equivalent. It represents an amount of a GHG whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO₂), based on its global warming potential.

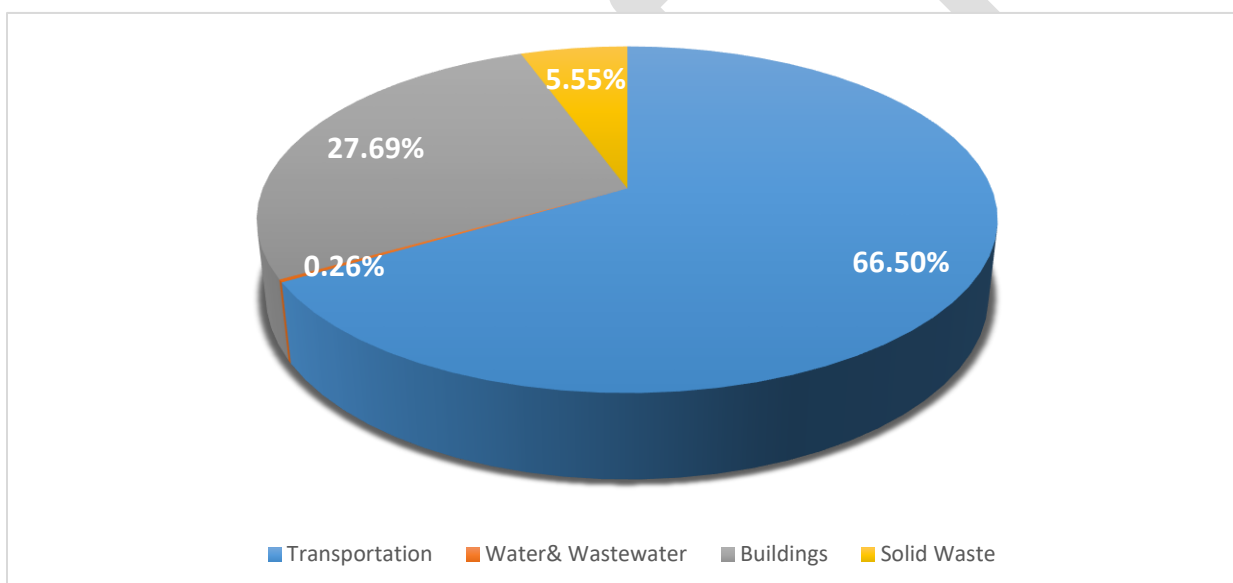
Figure 2-1: City of Sonoma’s communitywide GHG emissions (MT CO₂e), 1990-2020.



Between 1990 (96,890 MT CO₂e) and 2020 (75,085 MT CO₂e), total net GHG emissions decreased by 22.5%. Although the impact from the Covid 19 Public Health Emergency on the total GHG emissions cannot yet be determined, it is known to have reduced GHG emissions, especially in the transportation sector. (GHG emissions between 1990 and 2018 had increased by 2%.) It is not clear to what degree the GHG emissions will change in 2022; the next inventory year is scheduled to be released in the spring of 2024.

As expected, (see Figure 2-2), the transportation sector is the largest source of GHGs (66.5%). Building-related GHGs, Sonoma's second-largest source (27.69%), decreased by 35% between 1990 and 2020. In addition to the increased efficiency of lighting, appliances, and heating and cooling (HVAC) equipment, the most significant reductions were due to access to the low-carbon electricity provided by Sonoma Clean Power as discussed below.

Figure 2-2: Composition of Sonoma's communitywide GHG emissions in 2020.

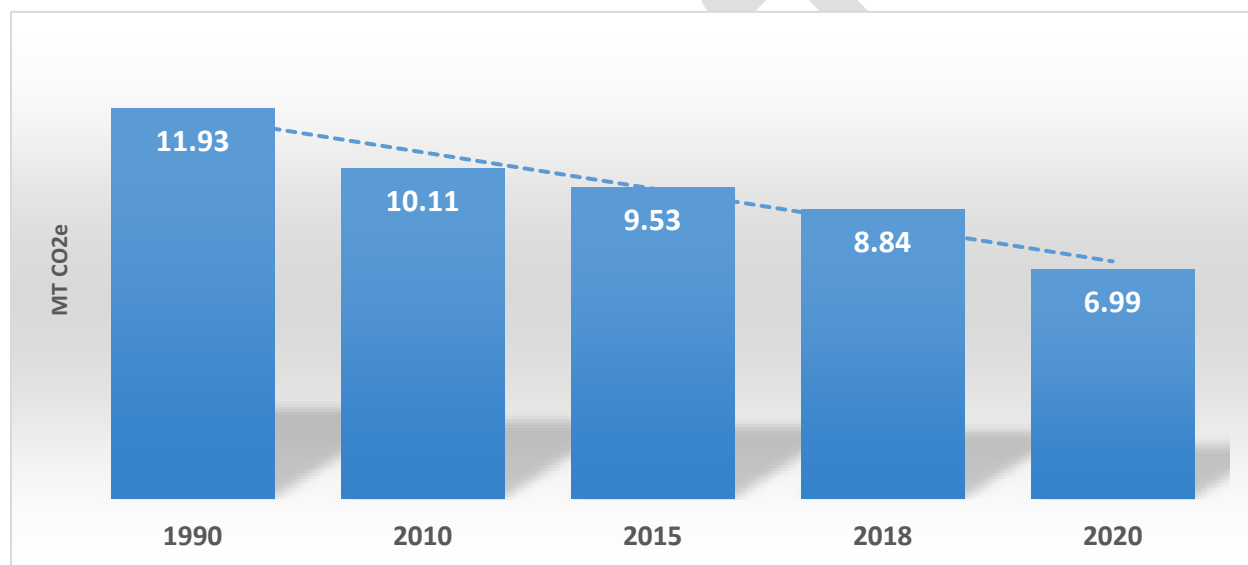


GHG emissions from solid waste management in 2020 were 5.6% of the total. While there was an increase of 16% between 1990 and 2018, by 2020, the emissions had decreased by 59% from 1990 levels. The significant decrease between 2018 and 2020 was likely because of Covid restrictions. GHG emissions generated by solid waste are especially important because they consist primarily of methane from the landfilling of organic materials. This powerful gas has 28 times greater greenhouse warming potential than CO₂ but has a significantly shorter lifespan in the atmosphere meaning. Therefore, it is an especially important GHG to reduce in the near-term.

While water- and wastewater-related GHGs have decreased by 94% between 1990 and 2020, they represent only 0.3% of total emissions in 2020. This decrease is due in part to significant water conservation efforts since 1990.

As shown in Figure 2-3, there has been a steady decrease in per capita GHG emissions. Between 1990 and 2018 (pre-covid), per capita GHG emissions decreased by 25.9% and decreased 41.4% between 1990 and 2020. Per capita measurements are important because they allow for the control of population changes in the data. In 2020, the Sonoma's per Capita emissions were 6.99 MT CO₂e, 15% higher than the countywide average. The City of Sonoma had the third highest per capita emissions among all Sonoma County jurisdictions in 2020.

Figure 2-3: Sonoma's per capita GHG emissions, 1990-2020.

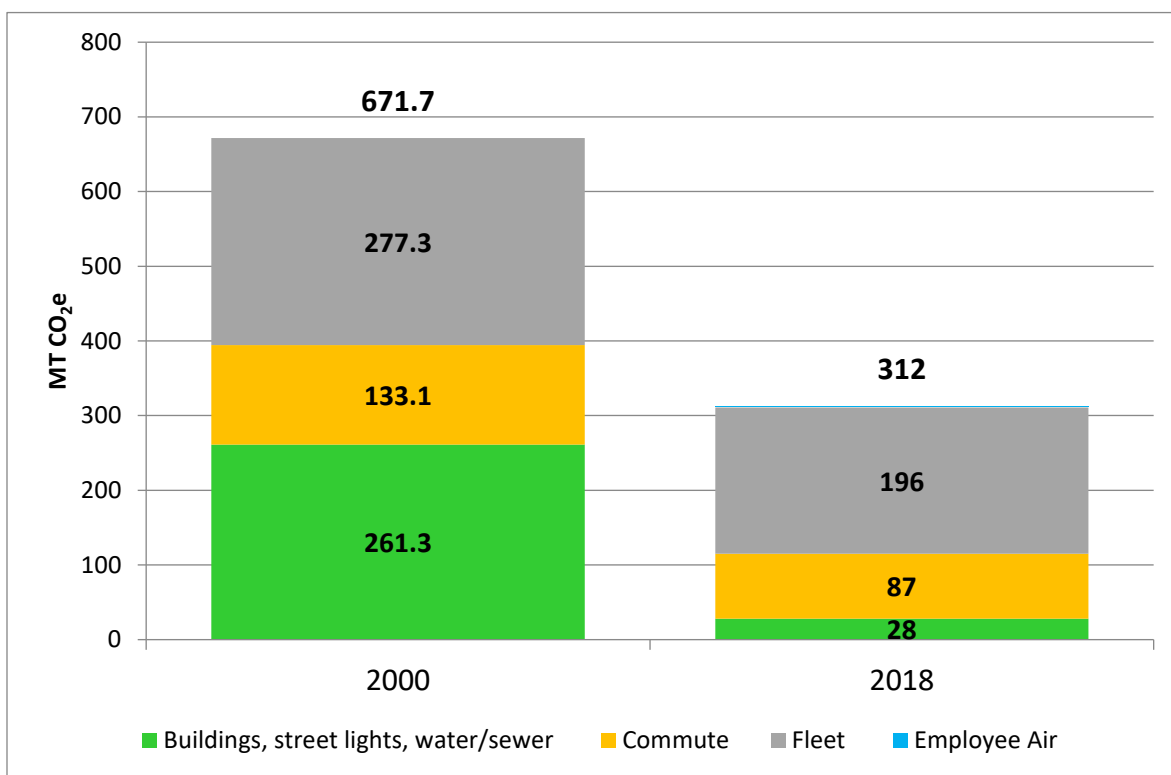


2.2 Government Operations GHG Inventory

The Sonoma Valley Climate Coalition, a local non-profit organization, with support from the city, volunteered to conduct an inventory of 2018 GHGs specifically from government operations. Their June 2020 report showed 2018 GHG emissions from Sonoma's government operations totaled 311 MT CO₂e¹¹, which accounts for less than 0.5% of total GHG emissions communitywide. As shown in Figure 2-4, between 2000 and 2018, Sonoma's GHG emissions from government operations decreased significantly—53.5%. The 2018 GHG emissions were dominated by transportation (91% of the total)—both employee commuting and fleet operations. In contrast, buildings, streetlights, and water/sewer together accounted for only 9% of total GHG emissions from government operations in 2018. Figure 2-5 presents the composition by source of 2018 government operations' GHG emissions.

¹¹ Inventory of Greenhouse Gas Emissions from City of Sonoma Municipal Operations for 2018. Prepared by the Sonoma Valley Climate Coalition, June 10, 2020.

Figure 2-4: Sonoma government operations GHGs, 2000 v. 2018.



2.5 Categories of Actions to Achieve Emissions Reduction Target

The following sections present a range of actions with the potential, collectively, to achieve our stated target of net zero GHG emissions by 2030. These actions have been adopted and implemented by other municipalities throughout the country as part of their municipal climate action plans. These actions are listed and discussed under the following six respective categories:

- Transportation,
- Buildings,
- Solid Wastes,
- Water,
- Government Operations, and
- Carbon Sequestration.

To help promote community engagement, the city should continue to publicize its actions and progress in reducing GHG emissions through a GHG reduction dashboard. This information will also serve as the basis of the CAC’s required annual GHG reduction scorecard.

3. Transportation

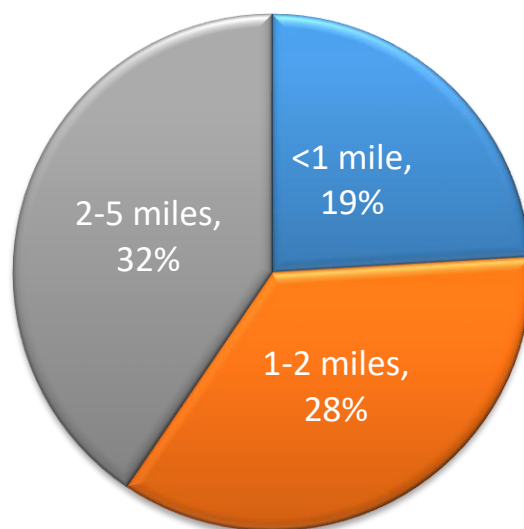
66.5% of Sonoma's GHG Emissions

Climate Strategy Goals:

- Increase use of electrified transportation.
- Decrease reliance on motor vehicles for short trips.
- Expand and enhance bicycle and pedestrian infrastructure.

Transportation is the single largest source of GHG emissions in Sonoma, accounting for almost two-thirds (66.5%) of all GHG emissions in 2020. While reducing transportation emissions is one of the most important tasks, it is the most challenging task. GHG emissions from transportation are primarily a result of our continuing reliance on fossil-fueled vehicles, currently the most dominant form of transportation. Sonoma also faces additional transportation challenges, including limited access to convenient regional public transportation and not being a commercial center. Residents must rely on personal vehicles to work and shop in nearby commercial centers including Napa, Petaluma, and Santa Rosa.

In addition, the city also does not have well connected bike and pedestrian paths to the adjacent populations in the Springs. Data from the Sonoma County Transportation Authority for Sonoma (SCTA) show that 79% of all motor vehicle trips are less than 5 miles, which is the lowest among the county jurisdictions. This means Sonomans heavily rely on motor vehicles to drive within the city and adjacent communities. In 2020, there were 66,000 daily trip origins in Sonoma and the average trip length was 4.2 miles in 2020. Figure 3-1 depicts the percentage of the trip lengths.

Figure 3-1: Distribution of trip lengths in Sonoma (2020).

While reducing reliance on personal, fossil-fueled motor vehicles is important to reduce GHGs, it will require major changes including behavior modifications, improved parking management, and increased bicycle and pedestrian infrastructure. However, the more cost effective and impactful solution to reduce GHG emissions currently resides in technology with increased electrification of transportation.

3.1 State and Federal Actions

3.1.1 California's Fossil-Fuel Vehicle Ban

The state's current GHG reduction targets are to reduce emissions by 40% from 1990 levels by 2030 and reach carbon neutrality by 2045. Governor Gavin Newsom signed Executive Order N-79-20 that seeks to ban the sale of new fossil-fueled vehicles in California by 2035. The Executive Order required the California Air Resources Board to develop implementing regulations, which were promulgated in August 2022. The Advanced Clean Cars II (ACC2) regulations require all in-state sales of new passenger cars and trucks be zero-emission by 2035.¹²

3.1.2 Federal Subsidies for EVs

At the federal level, passage of the 2022 Inflation Reduction Act adds point-of-sale rebates for new (up to \$7,500) and used (up to \$4,000) EV vehicles and provides tax credits and subsidies for auto manufactures to lower EV production costs.

¹² In October 2022, the European Union adopted similar legislation that all auto makers must achieve a 100% reduction in CO₂ emissions by 2035. This would mean a de facto ban on selling new fossil fuel-powered vehicles in the 27-country bloc. This action is likely to increase the availability of EVs in the US.

California leads the nation in the sale of new zero emissions vehicles (ZEVs).¹³ In the first half of 2023, 25.4% (223,298) of all new cars sold in California were ZEVs resulting in 1,623,211 total ZEV sales in California to date.¹⁴ And 40% of ZEVs sold in the U.S. are sold in California.

The National Electric Vehicle Infrastructure program will provide \$5 billion in formula funding to states to expand the EV charging infrastructure along highway corridors to fill gaps in rural, disadvantaged, and hard-to-reach locations.

3.2 Sonoma's Electric Vehicle Infrastructure

According to the U.S. Department of Energy, 80% of EV drivers charge at home due to convenience and lower energy costs.¹⁵ To encourage at-home charging, in 2017, the city adopted an expedited permit process for residential and commercial EV chargers with the time period of three to five business days for permit approval. In 2020, the city adopted the California Green Building Code (CALGreen), which requires L2 EV charging infrastructure—conduit and circuit sizing—for new construction. Additional CALGreen updates have further increased EV capability and readiness for new construction at commercial and multi-family unit dwellings.

In November 2020, city staff gave a presentation to the City Council, Possible Action for Options to Site Public Electric Vehicle Charging Stations. The City Council established an initial goal of Sonoma to have 12 additional, publicly available EV charger ports by 2024. The staff's presentation and subsequent City Council's discussion and recommendations formed the basis of the city's 2020 Electric Vehicle Charging Station Implementation Action Strategies, which was presented in March 2021. The EV charging station strategy plan provided a recommended plan of action to support installation of publicly accessible EV charger ports and meet the City Council's initial goal of 12 additional EV chargers. This included the following recommendations:

EV Chargers

- Level 1 (L1): the least expensive to purchase and operate, L1 charging occurs through a standard household outlet (110 volt) at a rate of about 4-5 miles range per hour. It is designed for overnight charging.
- Level 2 (L2) is the most common public charger. It requires 240-volt power and provide 11-25 miles range per hour. It is ideal for workplace, visitor, and customer charging.
- DC Fast Chargers (L3) (or Tesla SuperChargers) are the most expensive to purchase and operate but provide rapid charging with up to 80% of an EV's capacity in 30-45 minutes.

¹³ Zero emission vehicles include battery EVs, plug-in hybrids, and fuel cell powered vehicles.

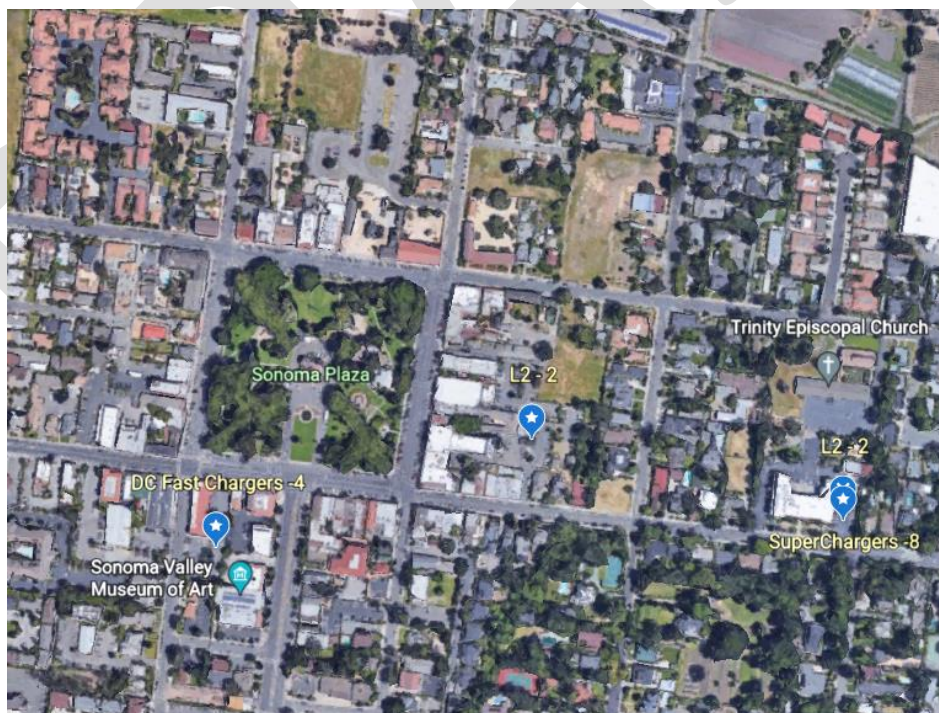
¹⁴ www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/new-zev-sales

¹⁵ <https://www.energy.gov/eere/electricvehicles/charging-home>

- Identify charging opportunities on the Plaza;
- Develop a city-funded cost sharing program to support installation of publicly accessible EV chargers on private property;
- Install EV chargers at Depot Park; and
- Install workplace chargers for City employees.

Simultaneous to this plan, the city has supported the expansion of public EV charging on non-city property (see Figure 3-2). In October 2021, eight new Tesla Superchargers plus two L2 universal EV chargers (the L-2 chargers were paid for by the city) were installed at the Sonoma Community Center. These 10 new chargers greatly expanded EV charging opportunities for residents, Sonoma Community Center patrons, visitors to the city, and commuters. These eight fast chargers (currently usable only by Tesla vehicles) complement four existing ElectrifyAmerica's DC Fast Chargers located at the Bank of America's parking lot at 35 West Napa Street. These publicly available EV chargers are well-located near the Plaza and are accessible by all types of EVs, not just Teslas. In July 2022, the city replaced its two, inoperable L2 (J 1772) chargers at the public parking lot (Lot B) at 152 East Napa Street.

Figure 3-2. Location of Publicly accessible EV Chargers in Sonoma.



3.3 Existing Bicycle and Pedestrian Infrastructure

Expanded bicycle paths are another core element of the city's climate strategy. Sonoma has created dedicated Class I pathways (3.91 miles), Class II bike lanes (1.99 miles), and Class III bike routes (2.41 miles).¹⁶ Although dedicated paths are the safest and most popular infrastructure components for bicycles, the city has limited available land resources to create more dedicated paths.

3.3.1 Currently Planned Future Trails

Sonoma's primary Class I path is the Sonoma City Trail, a paved, 1.5 mile east-west, multi-use trail that extends from Highway 12/Sonoma Highway across from Maxwell Regional Park to 4th Street East. Sonoma County Regional Parks has proposed a 4-mile, Class I bike and pedestrian trail that will connect the Sonoma City Trail to Highway 121 and 8th Street East in Schellville.¹⁷ When completed, this combined Class I trail will be 5.5 miles and would provide future connectivity to Sonoma County Regional Park's proposed Central Sonoma Valley Trail.¹⁸ This trail will be a 2.76-mile bike/pedestrian pathway consisting of bike paths, bike lanes, and bike routes that parallels Highway 12 is partially constructed and will better connect the Springs with the City of Sonoma. The entrance to this proposed trail will be a short distance from the Sonoma City Trail entrance. In addition, Sonoma County Regional Parks has a long-term plan for a Class I bike and pedestrian trail (the Sonoma Valley Trail) from Santa Rosa to the Springs.¹⁹

The recently completed Fryer Creek Pedestrian & Bicycle Bridge project improves access for residents on both sides of Fryer Creek and improves the connectivity to the citywide bicycle and pedestrian system. This means a safer route to local schools, workplaces, residential areas, and parks. The new paved bicycle and pedestrian path extends from the eastern bridge approach to the existing residential street on the north side of Newcomb Street.

3.3.2 Currently Planned Bicycle Parking

The adopted Downtown Parking Management Plan identifies improved and strategic bicycle parking near the Plaza as a component of reducing vehicle parking demands.²⁰ This includes

¹⁶ Sonoma Bicycle & Pedestrian Master Plan (2008, updated 2014).

¹⁷ <https://parks.sonomacounty.ca.gov/learn/planning-projects/project-directory/all-active-projects/sonoma-schellville-trail>

¹⁸ <https://parks.sonomacounty.ca.gov/learn/planning-projects/project-directory/all-active-projects/central-sonoma-valley-trail>

¹⁹ <https://parks.sonomacounty.ca.gov/learn/planning-projects/project-directory/all-active-projects/sonoma-valley-trail>

²⁰ <https://www.sonomacity.org/documents/public-draft-downtown-parking-management-plan/>

more secure and appropriate concentrated parking (e.g., corrals) and placement near path and lane entry and exit points.

3.3.3. Recent Pedestrian Infrastructure Improvements

In 2021 and 2022, CalTrans completed multiple pedestrian safety enhancements on Highway 12 (Broadway and West Napa Street), which included:

- Installing pedestrian crosswalk signs,
- Restriping pedestrian crossings with high visibility crosswalk markings,
- Installing pedestrian-activated crosswalk lights, and
- Upgrading ADA curb ramps.

The city has recently improved pedestrian crossings on Broadway. The project provided enhanced pedestrian safety improvements that included the installation of Rapid Rectangular Flashing Beacons at Patten Street, France/Andrieux Streets, Malet Street, and at a relocated crosswalk north of Traintown at Clay Street along with new curb ramps.

3.4 Recommended Transportation Actions

Table 3-1 lists recommended climate actions that have been adopted by other jurisdictions for transportation that are appropriate for Sonoma.

At the April 12, May 31, and August 9, 2023, meetings, the CAC voted to approve a list of priority climate actions related to transportation. The climate actions that appear in *blue italics* in Table 3-1 (in the Action column), are CAC-recommended priority climate actions.

Table 3-1: Recommended actions for transportation.

Category	Action	Summary
T-1. Expand Bicycle and Pedestrian Infrastructure	Prepare Master Plan for Bicycle and Pedestrian Infrastructure	Prepare master plan to improve and expand bicycle and pedestrian infrastructure.
	Connect the Sonoma City Trail to the Plaza	Enhance pedestrian and bicycle access to the Plaza area by connecting the Sonoma City Trail to the Plaza via a Class I or II trail.
	Increase Downtown Bicycle Parking	Create high visibility concentrated bicycle parking.
	Create Cool Corridors for Bicycle and Pedestrian Trails	Increase shade and passive cooling on bicycle and pedestrian trails.
T-2. Electrify Personal Transportation	Increase EV Charging at Multi-unit Dwellings	Increase availability of L2, EV chargers at multi-unit dwellings.

Category	Action	Summary
	<i>Expand Publicly Accessible EV Charging</i>	Add additional publicly accessible L2 EV chargers at Depot Park parking lot.
T-3. Improve Public Transportation	<i>Establish Electric Downtown Shuttle</i>	Establish an electric-powered downtown shuttle.
	Expand the #32 Sonoma Shuttle	Expand the run times for the #32 Sonoma Shuttle.
T-4. Ban New Fossil-Fueling Stations	<i>Explore Banning New Fossil-Fuel Filling Stations</i>	Consider adoption of an ordinance to prohibit construction of new fossil-fuel filling stations.
T-5. Reduce Idling	<i>Explore Banning New Drive Through Windows</i>	Consider adoption of an ordinance to prohibit construction of new drive-through windows.

3.4.1 Expand Bicycle and Pedestrian Infrastructure

Prepare Master Plan for Bicycle and Pedestrian Infrastructure - Appropriate and sufficient infrastructure is needed to increase people-powered transportation. It is recommended that the city prepare a master plan to identify where and how to expand bicycle and pedestrian infrastructure beyond existing trails. The plan would focus on identifying and ameliorating physical barriers to walking and bicycling (e.g., safety, secure parking, transit shelters, lighting, path/trail stripping, etc.) where appropriate. It should identify and explore opportunities to increase access by expanding or creating new bike/pedestrian lanes and trails where appropriate and to improve connections to sidewalks, paths, walks, and parks throughout the city.

Connect the Sonoma City Trail to the Plaza – A critical element of improving the use of bicycles and pedestrians is to ensure connection to and between main trails and destination locations for residents, workers, and visitors. A primary destination location in Sonoma is the Plaza, yet there is an inadequate connecting trail between the Sonoma City Trail and the Plaza. The city should create a Class I path or Class II bike lane that directly connects the existing multi-use Sonoma City Trail to the Plaza.

Improve Downton Bicycle Parking - A key component of increasing and improving bicycle and pedestrian infrastructure is to improve bicycle parking, especially near the Plaza. Rather than the current approach of scattering individual bicycle parking options around the downtown, the current trend to promote significant use by bicycles is to use concentrated parking, such as corral parking. A common approach is to convert an existing motor vehicle parking space to corral parking with space for 10-12 bikes; this can be more cost effective than multiple standalone racks scattered about. Corral spaces are highly visible, which is an important visual prompt for potential users

and are easier for bicyclists to identify and use. They need to be located at key points of entrance and exit for desirable places and transportation links such as the Plaza.

Create Cool Corridors for Bicycle and Pedestrian Trails - To maximize use of bicycle and pedestrian trails, it is important to identify potential barriers to their use. One barrier is high daytime temperatures during late spring, summer, and early fall. Dark colored pavement has low solar reflectance (albedo) and thus absorbs and retains heat from the sun; “black top” absorbs 80-95% of sunlight. The U.S. Environmental Protection Agency has found that conventional paving materials can reach peak summertime temperatures of 120–150°F. Heating of the pavements subsequently heats the pedestrian/bicyclist zone. After sundown, heating continues through environmental radiation where the thermal energy (heat) emanates from asphalt that had absorbed sunlight throughout the day (the urban heat island effect).

The city’s bicycle and pedestrian trails should become “cool corridors.” Cool corridors offer residents, commuters, and visitors of all ages and abilities relief from hot weather by creating and promoting natural and engineered shade, reducing the use of heat absorbing materials to lower daytime air temperature, increasing the availability of strategically located benches, and installing bottle-water filling stations or drinking water fountains to support rest and recovery in a cooler location. This approach would increase the use of trails during warmer months. A co-benefit of this action would be to decrease the urban heat island effect that would help lower cooling costs.

The most effective and lowest cost strategy is to increase the natural shade enhancement (trees) of the trail, specifically at existing benches. Benches, especially when coupled with shade, provide attractive and cooler rest stops. As presented in Table 3-2, the Sonoma City Trail has 39 benches, more than 40 percent of the benches lack shade. Following the installation of natural shade at benches lacking shade, the next step would be to increase shade throughout the trail.

Table 3-2: Inventory of existing benches and lack of shade on the Sonoma City Trail.

Section	Area	Existing Benches	Benches Lacking Shade	Percent Lacking Shade
Section 1*	Highway 12 to 4 th St. West	8	3	37%
Section 2	4 th Street West to 1 st Street West	9	4	44%
Section 3	1 st Street West to 1 st Street East	7	1	14%
Section 4	1 st Street East to 4 th Street East	15	9	60%
Total		39	17	43%
In Section 1, there is one additional bench without shade, which is technically in Olsen Park, but adjacent to the trail. Thus, it is not included in this inventory.				

3.4.2 Electrify Personal Transportation

Workplace charging for EV vehicles in Sonoma is very limited (only one workplace charger is currently known). The U.S. Department of Energy notes that 80% of EV drivers charge at home because of convenience and lower energy costs.²¹ However, EV charging at home is not generally possible for residents of multi-unit dwellings such as apartments and condominiums or residents who lack garages, driveways, or off-street parking adjacent to their home. Table 3-3 summarizes the breakdown of housing units in Sonoma as of 2021.

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²¹ <https://www.energy.gov/eere/electricvehicles/charging-home>

Table 3-3: Housing units in Sonoma, 2021.²²

Housing Unit	2021	Percent
Single-family detached	3,186	55.7%
Single family attached	583	10.2%
2 to 4 units	558	9.7%
5 units or more	914	10.6%
Mobile homes	484	8.5%
Total	5,725	

Increase EV Charging at Multi-unit Dwellings - As indicated by the above data, 20.3% of Sonoma's housing units are two or more units, which typically are apartment and condominium buildings. This percentage represents the minimum number of residential units likely without access to EV charging. Because the lack of charging opportunities is a barrier to EV ownership, increasing the availability of L2, EV chargers at or near multi-unit dwellings is a critical climate action. This would include the exploration of concentrated EV charging pods designed for residences and by exploring the use of non-utility owned light poles to install chargers.

While the city will continue to encourage existing multi-unit dwelling owners to install EV chargers for their residents, the city also should amend the building code to expand EV charging requirements for multi-family and non-residential properties as part of an EV reach code. For example, instead of requiring EV ready installations, the city could require actual EV charger installations.

Expand Publicly Accessible EV Charging - As noted above, staff recommended installing two L2 bollard post mounted chargers at the city-owned portion of the Depot Park parking lot. This action would provide 4 additional EV charger ports. While availability of public land suitable for EV chargers is extremely limited in the city, staff continue to explore additional candidate sites.

An alternative to the city purchasing, installing, operating, and servicing L2 EV chargers on public property, it is recommended that the city fund a five-year, cost sharing program for the siting and construction of publicly accessible EV chargers on non-city property. Entities would also be able to apply for CALeVIP rebate programs or other state or federal grants or rebates to significantly reduce their costs. In addition, private entities may be able to take advantage of tax deductions or credits that are not available to the city. This action eliminates the need for the incurring operational and maintenance costs and electricity costs for the city while achieving the goal of increasing the number of publicly accessible EV chargers. Under this option, assuming a \$10,000 per L2 charger port cost and a 50% (or \$5,000 per port cost sharing), the city would need to

²² www.sonomacity.org/documents/hcd-review-draft-of-the-6th-cycle-housing-element-background-report-part-2/

budget \$25,000 per year for 5 years to increase the number of publicly accessible L2 chargers by 25. This option could also be used to increase the number of EV chargers at multiple dwelling units.

3.4.3 Improve Public Transportation

Establish Electric Downtown Shuttle - An electric-powered shuttle service that connects, for example, senior housing to local shopping, the Sonoma County Transit bus stop at the Plaza, and public parking areas, would decrease reliance on personal vehicles for short trips. This action would require grant funding to purchase or lease an electric vehicle and ongoing funds to operate the route(s). In addition, an appropriate operator/partner would have to be determined (e.g., Sonoma County Transit, non-profit organization, etc.). At the Plaza, riders can use the Fare-Free Sonoma Shuttle (Route 32), subsidized by the city, which services Sonoma Valley. Route 32 has a north and south segment extending to Agua Caliente Road/Highway 12 to the north and to Temelec to the south. Riders can also use intercity buses to travel to Petaluma (Route 40) or to Oakmont and downtown Santa Rosa (Routes 30 and 34).

Expand the #32 Sonoma Shuttle – The city subsidizes the “Fare-Free” Sonoma Shuttle (Route 32). The shuttle runs Monday through Saturday, the last bus departing from the Plaza to the Springs leaves at 4:25 pm and the last bus that departs the Plaza for Temelec also leaves at 4:25. These times do not necessarily correlate to standard work hours and thus could limit ridership and increase personal vehicles. Therefore, it is recommended that the city explore options to expand the #32 service by adding additional departure times.

3.4.4 Consider Banning New Fossil-Fuel Filling Stations

The city should consider adopting an ordinance to ban new fossil-fuel filling stations (i.e., gasoline and diesel). A co-benefit of this action would be to prevent future sources of contamination and pollution by reducing air emissions and soil, groundwater, and surface water contamination from leaking and spilled fossil fuels. However, this action would not have any direct impact on GHG emissions. Currently there are five fossil-fuel filling stations located in city limits with additional stations located nearby in the Springs. An ordinance to prohibit construction of new fossil fuel stations (including any expansion of existing stations’ capacity) should exempt hydrogen fueling and electric charging infrastructure.

3.4.5 Reduce Idling

The city should consider adopting an ordinance to ban construction of new drive-through windows. Customers who wait in idling cars release more carbon emissions than those who park and walk-up or visit inside. A co-benefit of this action would include improved traffic flow and reduced traffic congestion.

3.5 Implementation of Climate Actions for Transportation

This section outlines a strategy to implement each category of transportation related climate actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will include initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months). Regarding GHG reduction potential, in the absence of specific reduction data, relative, qualitative categories for potential reduction in GHG emissions relative to the specific category (not total community GHG reductions) are used for comparison purposes including none (0%), low (1-10%), moderate (11-24%), and high (25% or greater).

T-1 Expand Bicycle and Pedestrian Infrastructure					
Starting in Fiscal Year 2024-25, expand and improve opportunities and connections for people-powered transportation.					
Target Year	Performance Metric				GHG Reduction Potential
2023	Added Downtown bicycle parking				Medium
2024	Create cool corridor bicycle and pedestrian trails				Medium
2025	Master plan for bicycle & pedestrian infrastructure				Low
2025	Connect Sonoma City Trail to the Plaza				Low-Medium
Implementation Details					
Implementation Timeline	Medium to Long	Start Year	2023	Completion Year	2027
Co-Benefits	<ul style="list-style-type: none"> • Reduced traffic and parking needs for Plaza area • Improved public health 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Suitable locations for bicycle parking at the Plaza have been identified, a preliminary cool corridor plan has been prepared, and a potential connection to the Plaza has been identified. 2. Estimate site-specific costs for options and a master plan. 3. Issue an RFP for consulting services for plan preparation. 4. Prepare site-specific plans. 5. Complete cost estimates. 				
City Costs	<ul style="list-style-type: none"> • Staff time required to develop detailed costs for the cool corridor program and the connection to the Sonoma City Trail. • Constructing a connection trail to the Plaza would cost about \$300,000. • Staff time needed to identify grants to support tree planning for the cool corridor project. • Purchase of bicycle parking corrals for the Plaza and their installation would cost approximately \$2,000. • Hiring a consultant for a master plan for bicycle & pedestrian infrastructure for the city will cost approximately \$50,000. 				
Community Costs	No known community costs at this time.				
Funding Opportunities	USDA Urban & Community Forestry				

T-2 Electrification of Personal Transportation					
Starting in Fiscal Year 2024-25, increase the availability of publicly accessible EV charging.					
Target Year	Performance Metric				GHG Reduction Potential
2024	Fund a cost sharing program to add 25 L2 charger ports				Medium/High
2026	Add 20 L2 EV charger ports for multifamily units.				Medium
2026	Add 4 L2 EV charger ports for public charging				Low
Implementation Details					
Implementation Timeline	Short-term, then Ongoing	Start Year	2024	Completion Year	2026, then ongoing
Co-Benefits	<ul style="list-style-type: none"> • Cost-savings for EV owners/lessees • Equitable access to charging for all residents 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Identify suitable charger locations for multifamily dwellings, private partners, and/or public property. 2. Estimate site-specific costs for options. 3. Explore city-funded cost sharing program. 				
City Costs	<ul style="list-style-type: none"> • Staff time required to update the 2021 EV Charger Implementation Strategy. • To add 4 L2 EV charger ports on public property, capital costs will be approximately \$50,000, annual operation and maintenance costs will be approximately \$500. • If city funds a cost-sharing program for a private-public partnership for existing structures, \$100,000 would result in ~25 EV charger ports with no annual operation and maintenance costs to the city. 				
Community Costs	Residents and businesses would pay for the electricity costs to charge. Using the cost sharing program, building owners would pay a portion of capital costs, installation, and operation and maintenance.				
Funding Opportunities	CALeVIP Federal BIF/IRK Sonoma Clean Power				

T-3 Improve Public Transportation					
Starting in Fiscal Year 2024-25, increase availability of public transportation.					
Target Year	Performance Metric				GHG Reduction Potential
2024	Expand operational times for the free #32 Sonoma Valley Shuttle.				Low
2025	Establish a downtown circular electric shuttle				Low
Implementation Details					
Implementation Timeline	Short-term, then ongoing	Start Year	2024	Completion Year	2028, then ongoing
Co-Benefits	<ul style="list-style-type: none"> • Reduced traffic and parking demands. • Reduced traffic congestion around the Plaza area. • Reduced ground-level ozone. • Increased equitable access for Sonoma Valley residents. 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Contact Sonoma County Transit to discuss feasibility and funding requirements for expanded shuttle operations. 2. Develop a downtown shuttle feasibility study with potential routes, cost estimates, and identification of potential contractor/partner to provide service. 				
City Costs	<ul style="list-style-type: none"> • Increase in funding contribution for expanded shuttle operations. • Development of a feasibility study. • Cost of a downtown electric shuttle is unknown. 				
Community Costs	No known community costs as this time.				
Funding Opportunities	None known at this time.				

T-4 Ban New Fossil-Fueling Stations					
Consider a ban on construction of new fossil-fueling stations.					
Target Year	Performance Metric				GHG Reduction Potential
2024	Effective date of a new ordinance.				None/Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced potential for future threats to soil, surface water, and groundwater from spilled and leaked fossil fuels. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Research regional, model ordinances. Write Sonoma-specific ordinance. 				
City Cost	Staff time required to write proposed ordinance and supporting materials.				
Community Cost	No known community costs as this time.				
Funding Opportunities	None				

T-5 Reduce Idling					
Consider ban on construction of new drive-through “windows.”					
Target Year	Performance Metric				GHG Reduction Potential
2024	Effective date of a new ordinance.				Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced traffic congestion. Improve flow of traffic. Reduced ground-level ozone. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Research regional, model ordinances. Write Sonoma-specific ordinance. 				
City Cost	Staff time required to write proposed ordinance and supporting materials.				
Community Cost	No known community costs as this time.				
Funding Opportunities	None				

4. Buildings

27.69% of Sonoma's GHG emissions

Climate Strategy Goals:

- Increase the electrification of buildings.
- Expand adoption of Sonoma Clean Power's CleanStart and Evergreen options.
- Improve energy efficiency of heating, cooling, and appliances.
- Increase the conservation of energy in buildings.
- Decrease consumption of natural gas.
- Increase interior and exterior lighting efficiency.
- Expand installation of PV solar systems.
- Explore the feasibility of microgrids and multi-family solar systems.

At 27.69% of Sonoma's GHG emissions in 2020, buildings are the second largest category of GHG emissions. GHG emissions from buildings include direct (from combustion of natural gas) and indirect emissions (from electricity) to heat, cool, and light buildings. And, from the energy consumed to power appliances (e.g., washers, dryers, hot water, dishwashers, refrigerators, freezers, televisions, and stoves) and office equipment (e.g., computers and printers). A building's envelope, the physical separator between the conditioned and unconditioned environment also can be a source of indirect emissions where it has insufficient insulation, leaks, and gaps.

Electricity-generated GHGs in Sonoma County are far lower than GHGs from combustion of natural gas used for heating and certain appliances (hot water, stoves, and dryers) due to our local supply of low carbon-intensity electricity. Moreover, improving the efficiency of electric heating and cooling systems (e.g., using heat pumps) and appliances reduces GHG emissions.

In July 2013, Sonoma joined the Sonoma Clean Power (SCP) consortium, a Community Choice Aggregation (CCA) program. The CCA program authorizes qualifying governmental entities to purchase and/or generate electricity for their residents and businesses. SCP serves the residents

and businesses in Sonoma and Mendocino counties by purchasing low-carbon energy from renewable resources, such as geothermal, wind, and solar. With SCP, the default electricity service is called CleanStart which is 49% renewable and 93% carbon free (this service relies heavily on hydropower, which the state does not classify as renewable). Customers can also choose SCP’s EverGreen option, which is 100% renewable energy from local, low carbon sources (solar and geothermal). As the system is structured, all new customers in the SCP service area are automatically enrolled into CleanStart. Customers have to opt-out of CleanStart and either opt-in to the EverGreen program or a Pacific Gas and Electric (PG&E) option with varying carbon emissions. In 2022, the carbon emissions rate for EverGreen was 70 lbs. CO₂/MWh and for CleanStart was 112 lbs. CO₂/MWh.

As shown in Figure 4-1, Sonoma has a total of 6,436 electrical power meters used by 5,614 customers: residential (83.8%), commercial & industrial (16%), state government (0.2%), and agriculture (0.1%). Of the total eligible meters in 2023, 87% use SCP (CleanStart and Evergreen) while only 13% opted out. Of the SCP customers in Sonoma, only 1.5% subscribe to EverGreen, which is ranked seventh out of the nine Sonoma County jurisdictions.

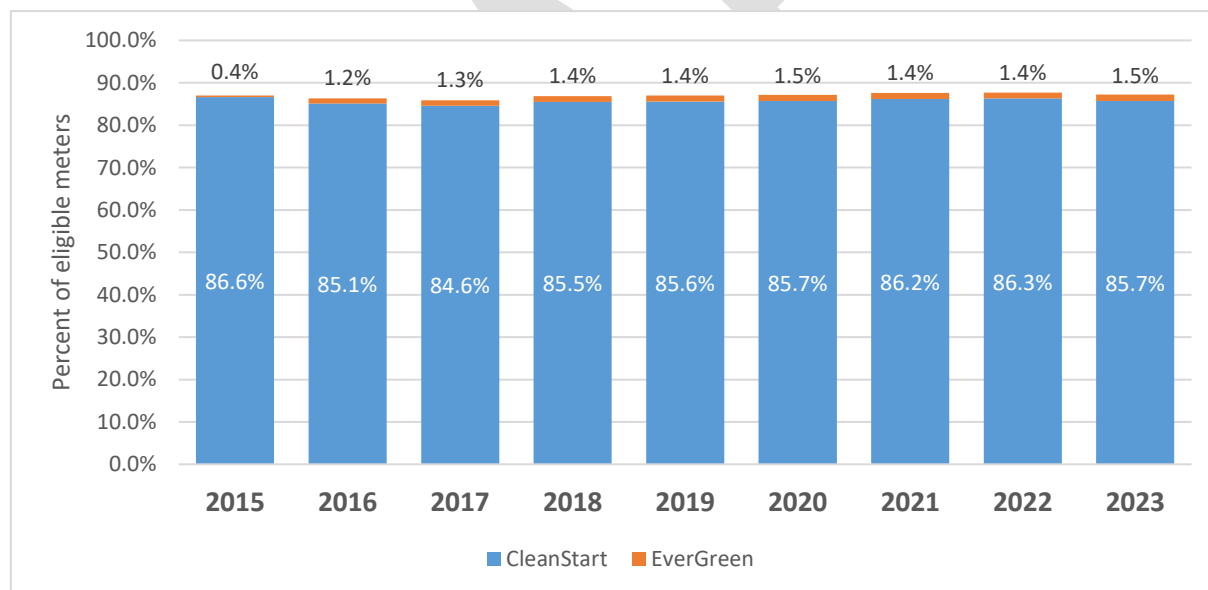


Figure 4-1: Percent of Sonoma customers using Sonoma Clean Power.

Using low carbon power from SCP, especially Evergreen, is critical for meeting the city’s climate targets and can be combined with expanded installation of photovoltaic (PV) solar systems and solar water heaters. In addition, installing battery storage allows for the capture, storage, and later consumption of excess solar-generated power. With a battery system, a house or building can be powered during the evening and overnight without drawing power from the grid. EVs (many models) can have a bidirectional charger installed, which allows the EV to power a building

using some of the energy stored in its battery (also known as vehicle-to-grid [V2G] or vehicle-to-home [V2H] charging). In this way, an EV can reverse the process of taking power from the grid with the EV battery supplying energy back to the grid or to a building. They can also serve as a backup system during power outages. For example, a 70 kWh EV battery (the average size in a vehicle) can power an average home for 2 days (depending on its energy load).

4.1 Federal Financial Credits and Rebates

Through the 2022 federal Inflation Reduction Act, the federal government has created numerous federal rebates and tax credits to increase the generation of zero carbon electricity, install energy efficient equipment, and involve energy conservation actions. For example, the installation of home solar panels is eligible for a 30% tax credit through 2032, which drops to 26% in 2033, and 22% in 2034. Installing energy efficient heat pumps for climate control is eligible for rebates of up to \$8,000. Installing electric heat pump water heaters can receive \$1,750 rebates. Additional consumer subsidies include \$840 for an electric induction cooktop and up to \$9,100 for improvements to electric panels, wiring, and home insulation.

4.2 Increased PV Solar Installations

There have been significant installations of PV solar in zip code 95476 (the data is collected based on zip code rather than jurisdictional boundaries).²³ For example:

- Between 2002 and 2023, 2,066 residential accounts in zip code 95476 (51% increase since 2019) installed PV solar units for a total of 14,209 kW DC installed capacity (61.8% increase since 2019); an average of 6.88 kW DC per installation.
- Between 2002 and 2023, 105 commercial accounts in zip code 95476 installed PV solar units with 5,031 kW DC total installed capacity for an average of 47.92 kW DC per installation.
- Between 2016 and 2023, 5 non-profit accounts in zip code 95476 installed PV solar units with 162.5 kW DC installed capacity.
- Between 2016 and 2023, 3 industrial accounts in zip code 95476 installed PV solar units with 1,134.7 kW DC total installed capacity.

The California Energy Commission introduced the California New Solar Mandate, which is a building code that requires new home construction to have a solar PV system as an electricity source. This code, in effect from January 1, 2020, applies to both single-family homes and multi-family homes that are up to three stories high. While this supports solar in new construction, the

²³ California Energy Commission & California Public Utilities Commission, 2023, www.californiadgstats.ca.gov/downloads

vast majority of buildings in Sonoma are not subject to the New Solar Mandate because they are existing buildings. However, the 2022 Inflation Reduction Act increased and expanded tax credits for installation of solar power. Also under this act, domestic manufacturers of solar equipment are eligible for subsidies and tax credits, which are designed to lower the cost of PV solar. Consequently, increasing an individual’s ability to afford, while simultaneously decreasing the cost of equipment, will have a significant positive impact of the installation of PV solar on existing buildings.

The installation of PV solar in the city requires a permit. To reduce the time requirements for permitting for PV solar, the city adopted an expedited PV solar permitting for single- and dual unit residential buildings. SolarAPP+ is the city’s automated application for permitting new residential rooftop solar and storage systems that result in instantaneous plan review. Also in 2015, the city initiated an expedited permit process for battery energy storage systems, which now takes 2 to 4 days.

4.3 Recommended Building Actions

Table 4-1 lists recommended climate actions that have been adopted by other jurisdictions that are applicable for buildings in Sonoma.

The climate actions that appear in *blue italics* in Table 4-1 (in the **Action** column), are recommended by the CAC as priority climate actions for transportation.

Table 4-1: Recommended actions for buildings.

Category	Action	Summary
B-1. Reduce Reliance on Natural Gas	<i>Encourage Increased Electrification and Energy Efficiency in Residences and Commercial Buildings</i>	Promote and educate property owners on energy efficiency programs and benefits.
	Adopt All-Electric or Electric Preferred Reach Code	Adopt all-electric or electric preferred reach code that would ban or discourage future natural gas hookups.
B-2. Increase Community Energy Efficiency	Sponsor Lighting Efficiency Giveaway Events	Sponsor giveaway events that focus on energy efficient lighting and smart power strips.
	<i>Offer Energy Efficiency Workshops</i>	Sponsor local energy efficiency workshops to provide information and demonstrations of energy efficient equipment.
	Deploy Local Energy Conservation Teams	Work with a local partner (non-profit) to install energy and water efficient items at senior, lower-income, and multi-family residents.

Category	Action	Summary
	<i>Promote Building Energy Benchmarking</i>	Promote the adoption of building energy benchmarking for smaller commercial buildings.
B-3 Expand PV Solar	<i>Increase Installation of PV Solar</i>	Expand education and outreach and work with the Sonoma County General Services on offering free PV solar workshop.
B-4. Consider Community Microgrids	Explore Feasibility of Community Microgrids and Multi-family Solar Systems	Conduct feasibility assessment with local partner to pilot a microgrid in city limits.

4.3.1 Reduce Reliance on Natural Gas

Adopt All-Electric or Electric Preferred Reach Code - Appliances and buildings that use natural gas, a carbon-based fuel, remain a significant source of Sonoma’s GHG emissions, second only to transportation. “All electric” buildings generate fewer emissions in Sonoma because the community’s electricity provided by Sonoma Clean Power is very low carbon.

It is recommended that the city enact an ordinance to adopt an all-electric reach code that would ban all new natural gas hookups in residential and non-residential construction. Or the city should adopt an ordinance that would encourage all electric units and discourage use of most new natural gas hookups. For example, these ordinances could include requiring electric water heaters, heating and air conditioning systems, ovens/stove tops, clothes dryers, and fireplaces.

4.3.2 Increase Community Energy Conservation and Efficiency

Sponsor Lighting Efficiency Events - The city should sponsor, with a community partner (e.g., non-profit), periodic or annual energy efficiency events where free or greatly reduced LED lightbulbs and smart power strips could be given away to city residents. LED lighting is about 75% more efficient than fluorescent lighting and has a longer life, thus fewer replacements are needed. In addition, fluorescent lamps contain mercury, a powerful neurotoxin. With smart power strips, some of the outlets on the strip are always “hot” while designated outlets will shut off when the control outlet is triggered (e.g., when a computer enters sleep mode). This reduces unnecessary standby and ghost power consumption (e.g., monitors, printers, and other peripherals). Staff could

Energy Efficiency v. Energy Conservation

Energy efficiency and energy conservation are related and often complimentary approaches to reduce energy consumption, but there is a difference. *Energy efficiency* refers to the same or improved performance of reduced energy consumption (switching to LED lights). *Energy conservation* refers to actions taken to reduce the amount of energy consumed (turning off a light when not in use).

attend these events to answer questions and distribute energy efficiency and conservation information.

Offer Energy Efficiency Workshops - The city should partner with Sonoma County's Energy and Sustainability Division and/or Sonoma Clean Power, to hold annual or semi-annual workshops in the city on energy efficient equipment and strategies. These workshops would include presentations and demonstrations on ductless heat pumps, hot water heat pumps, whole house fans, and other energy efficient HVAC devices. In addition, the importance and value of energy audits would be discussed.

Deploy Energy Conservation Teams - Energy conservation is always the priority with regard to energy reduction projects because it seeks to eliminate "wasted" energy. With buildings, wasted energy occurs from leaks in the building envelope typically through poor or missing caulk or weather stripping around windows, doors, electrical outlets, HVAC vents, and insufficient or old roof and wall insulation.

It is recommended that area non-profits be contracted to deploy bilingual Energy Conservation Teams in Sonoma to lower-income, senior housing, and multi-family households. During these visits the teams could distribute and demonstrate energy and water conservation and efficiency actions and distribute efficiency kits (e.g., LED light bulbs, a smart power strip, high-efficiency bathroom and kitchen faucet aerators, and toilet leak detection tablets). Teams would also conduct basic testing (IR thermometer and kill-o-watt meters) to identify and remediate any easy-to-solve problems.

Promote Building Energy Benchmarking Program - Energy benchmarking programs are a mechanism to publicize buildings' energy efficiency status. The California Energy Benchmarking Program requires large commercial buildings (over 50,000 sq. ft.) to make their energy scores available to the public. The recommendation is to work with commercial building (less than 50,000 sq. ft) owners and operators to promote energy benchmarking. For example, the U.S. EPA's Energy Star Portfolio Manager is a free, interactive energy management tool that allows building owners and operators to securely track and assess energy and water consumption across a building's portfolio. The Portfolio Manager can help identify energy consumption problems and verify efficiency improvements.

4.3.3 Increase Installations of PV Solar

Switching to localized clean renewable sources of electricity to power homes and businesses is critical for meeting the city's climate targets. One approach is to expand the installation of PV solar and solar water heaters (primarily for pools). According to Project Sunroof, 85% of Sonoma's 15,600 roofs are solar-viable.²⁴ These 15,600 roofs could generate over 373 million kWh per year. Based on Project Sunroof's estimates, if all of Sonoma's roofs had PV solar,

²⁴ https://sunroof.withgoogle.com/data-explorer/place/ChIJEWh46T2nhYARa1V1vP0_Qs0/

160,00 MT of CO₂ would be avoided, which is more than twice the amount of all the GHGs emitted by Sonoma in 2022. The city should work with the Sonoma County Energy and Sustainability Division to promote their delivery of free and unbiased consultations on PV solar potential for residential and commercial structures.

4.3.4 Explore Feasibility of Community Microgrids and Multi-Family Solar Systems

A microgrid is a locally controlled power source that can integrate multiple energy resources, including clean energy supplies such as solar and wind, to provide independent, localized power. Moreover, when a traditional power grid goes down, a microgrid can continue serving its included load. By matching local energy demand to local sourcing, microgrids reduce energy loss in transmission thereby creating a more efficient system of electricity delivery.

The city should seek a local partner to explore the feasibility of a pilot project to demonstrate a neighborhood microgrid. Locating a solar array with batteries in a location where its solar electric output can be shared by neighbors without crossing a road, the new multi-family system could negate the need to coordinate with PG&E except for grid connection. This scenario would reduce costs and provide battery back-up if, or when, there is a PG&E outage. Another possible connection/pilot is a municipal building, such as the Police Department, which houses the city's Emergency Operations Center, where the benefits of the lowered costs and emergency back-up would benefit the community.

4.4 Implementation of Climate Actions for Buildings

This section outlines a potential strategy to implement each category of buildings-related climate actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will be likely including initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months). Regarding GHG reduction potential, in the absence of specific reduction data, relative, qualitative categories for potential reduction in GHG emissions relative to the specific category (not total community GHG reductions) are used for comparison purposes including none (0%), low (1-10%), moderate (11-24%), and high (25% or greater).

B-1 Reduce Reliance on Natural Gas					
Consider adoption of all-electric or electric preferred reach code that would ban or discourage future natural gas hookups.					
Target Year	Performance Metric			GHG Reduction Potential	
2024	Effective date of a new ordinance.			Low	
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024
Co-Benefits	<ul style="list-style-type: none"> Reduced energy costs. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Research model ordinances. Write Sonoma-specific ordinance. Work with Sonoma Clean Power on potential incentives. Promote and educate property owners on energy efficiency programs and benefits. 				
City Cost	Staff time required to write proposed ordinance and supporting materials.				
Community Cost	No known community costs as this time.				
Funding Opportunities	None known at this time.				

B-2 Increase Community Energy Conservation and Efficiency					
Starting in calendar year 2024, initiate energy efficiency events and initiatives to increase energy conservation and efficiency practices by residents and businesses.					
Target Year	Performance Metric			GHG Reduction Potential	
2024	Significant participation by residents and businesses			Medium	
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced energy costs. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Develop programs including outreach goals. Work with partner organizations to co-sponsor or co-host events. Explore incentives for residents and businesses to upgrade the electricity to Sonoma Clean Power's all-renewable Evergreen program. 				
City Cost	<ul style="list-style-type: none"> Staff time required to develop programs and coordinate with potential partners. Approximately \$5,000 to support cost-sharing of energy conservation and efficiency devices. 				
Community Cost	Voluntary costs for participants who lease or purchase energy efficiency items and equipment. SCP rebates and state and federal government rebates, grants, and tax credits are available to customers.				
Funding Opportunities	BayRen Sonoma Clean Power				

B-3 Expand Installation of PV Solar Systems					
Increase use of PV Solar Systems					
Target Year	Performance Metric			GHG Reduction Potential	
2024	Attendance by participants and installation of PV systems			Medium	
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced energy costs. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Expand education and outreach and work with the Sonoma County Office of Climate and Resiliency to offer free PV solar workshops. <ol style="list-style-type: none"> Contact Sonoma County Office of Climate and Resiliency and Sonoma Clean Power to develop workshop schedule. Determine location. Advertise and promote workshop. Hold workshop and conduct follow-up. 				
City Costs	<ul style="list-style-type: none"> Staff time required to coordinate, conduct outreach, attend workshop, and conduct follow-up. Approximately \$500 to support advertising and promotion. 				
Community Cost	None known at this time.				
Funding Opportunities	State of California and US Department of Energy Grants				

B-4 Explore Feasibility of Community Microgrids and Multi-family Solar Systems					
Explore the feasibility of community microgrids and community solar systems in Sonoma.					
Target Year	Performance Metric			GHG Reduction Potential	
2024	Effective date of a new ordinance.			Medium	
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced energy bills. Increased resiliency from PSPS's and natural disasters 				
Basic Implementation Steps	<ol style="list-style-type: none"> Determine candidate location(s) with PG&E. Find an appropriate consultant or vendor. Obtain quote(s) from vendors on the number of solar panels, location, costs, other variables, and timing of implementation. Obtain quote from the vendor on batteries, locations, and battery installation. 				
City Costs	Staff time required to conduct research and coordinate with potential partners.				
Community Cost	None known at this time.				
Funding Opportunities	BayRen Sonoma Clean Power				

5. Solid Waste

5.5% of Sonoma's GHG emissions

Climate Strategy Goals:

- Reduce consumption of single-use plastics.
- Increase segregation of organic materials.
- Expand recycling and organics segregation in public spaces.
- Increase backyard composting.

Solid waste is the third largest source of GHG emissions in Sonoma, accounting for 5.5% of GHG emissions in 2020. While there is no landfill within the city, the GHG emissions from landfilling our solid wastes in the county count toward our total GHG emissions. As shown in Figure 5-1, the city's quantities of municipal solid waste (MSW) generated have declined by 8.8% since 2014.²⁵ Figure 5-2 depicts the average daily per capita MSW generation for Sonoma between 2014 and 2022, which has decreased 7% since 2014.²⁶

Most of the solid-waste related GHG emissions are generated when organic materials (e.g., food scraps, yard waste) and compostables are landfilled. In a landfill, organic materials generate methane, a potent GHG. In contrast, organic materials that are sorted and then composted through properly controlled *aerobic* processes do not create methane. Composting through controlled *anaerobic* processes produces methane (or biogas), which is captured and used as a fuel source. Both processes convert the materials into a nutrient-rich soil amendment. Compost also has co-benefits when applied to soil as it increases water retention, improves soil health, and supports plant growth that can increase carbon sequestration.

²⁵ In Figure 5-1, municipal solid waste categories combine all materials generated by residents and commercial customers (this includes multi dwelling units). C&D refers to waste generated from the construction and demolition of buildings.

²⁶ The daily per capita generation rate includes residential and commercial customers combined and trash, recycling, organics, and commercial food waste divided by the city's population obtained from the California Department of Finance.

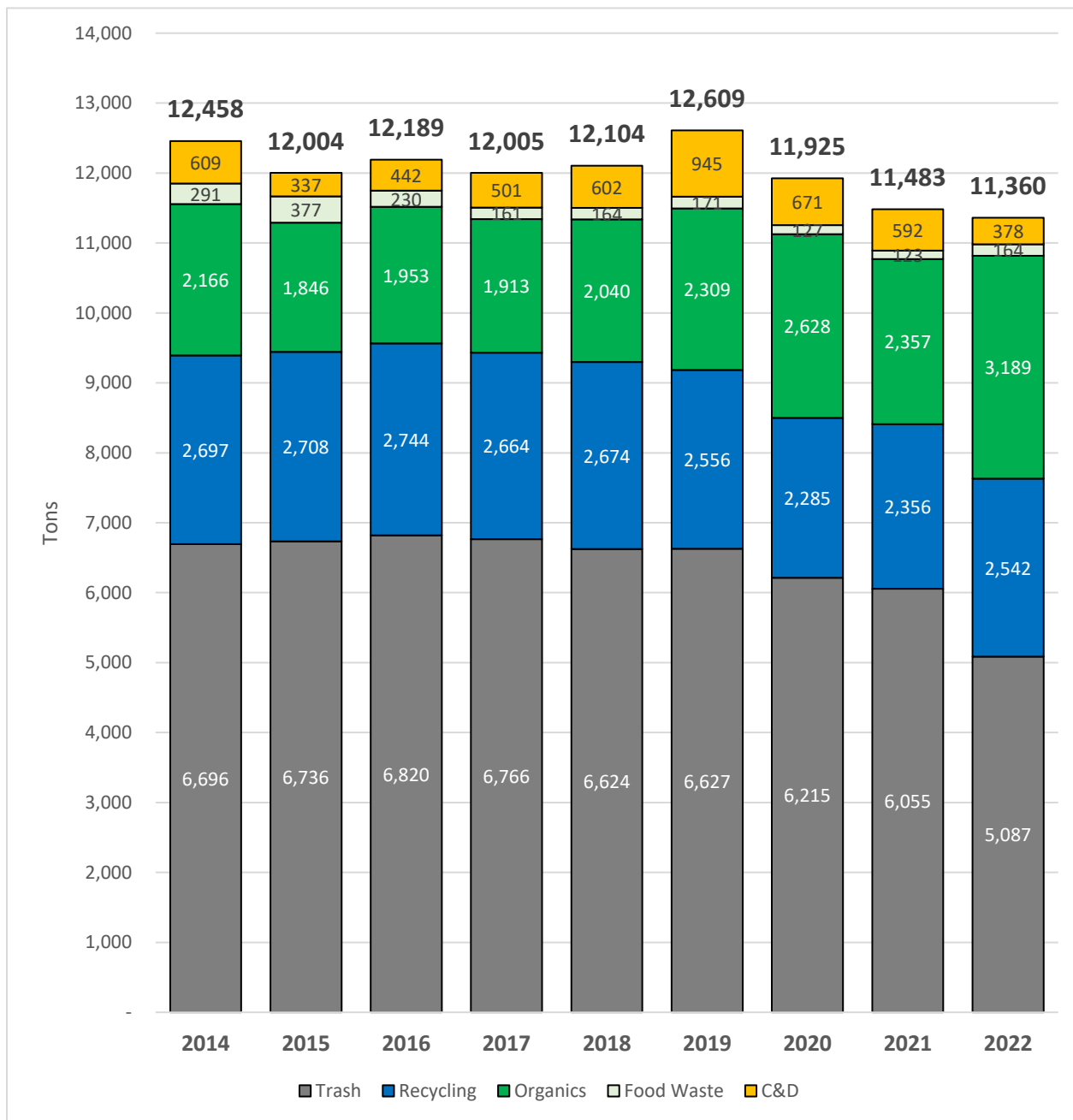


Figure 5-1. Sonoma’s combined municipal solid waste generation, 2014-2022.

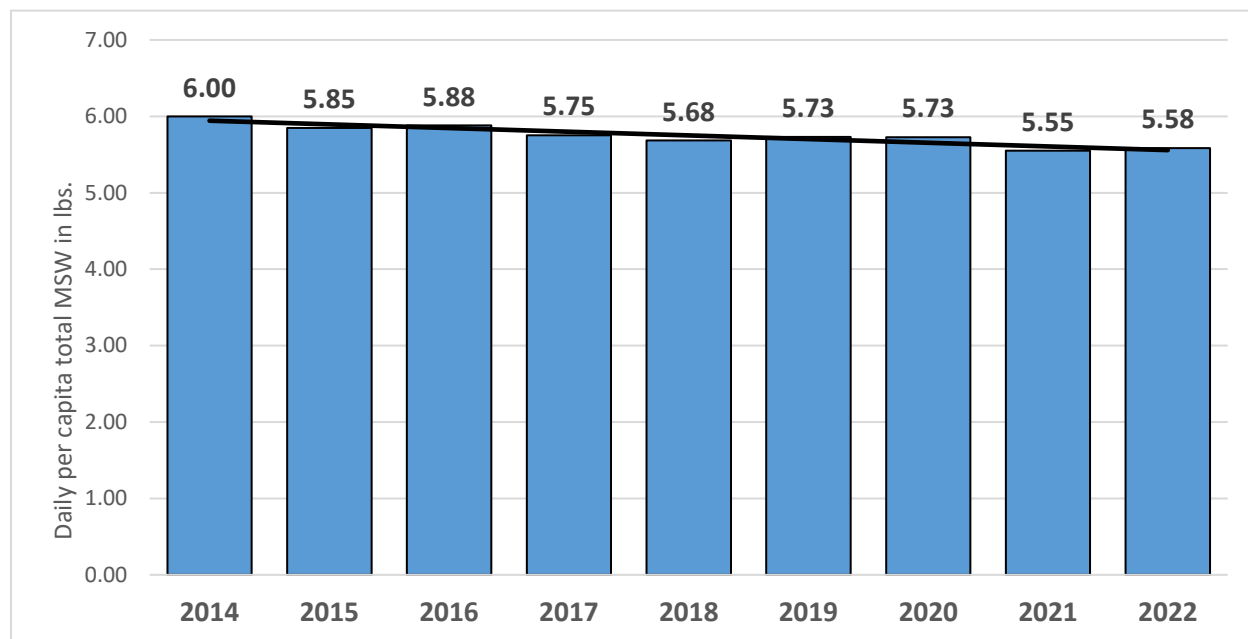


Figure 5-2. Sonoma's daily per capita municipal solid waste generation (in lbs.), 2014-2022.

Single-use plastics including plastic bags, wraps, films, and food serviceware are energy-intensive to produce—plastic production accounts for more than 3% of total U.S. energy consumption. Despite their high embodied energy consumption, most plastics are landfilled or released in the environment as only about 7-9% of all plastics are currently recycled, most of which are “downcycled,” or repurposed into low-value products. Avoiding the use of single use plastics has many environmental benefits in addition to reducing GHG emissions.

5.1 Mandatory Organics Separation and Recycling

On December 1, 2021, the City Council adopted a new mandatory organics separation and recycling ordinance in accordance with the statewide requirements of SB 1383, the *Short-Lived Climate Pollutant Reduction Act*. The law's goals seek to reduce total amounts of organic materials sent to landfills by 75% by 2025 and to reduce landfill-generated methane, a powerful GHG.

To support this ordinance, city staff developed an education and outreach program that included creating and launching our new *Sort It Sonoma!* program, which included the creation of a

dedicated website. In addition, staff developed public service announcements for KSVY radio and TV and produced videos that have been posted on the *Sort It Sonoma!* website.²⁷

In the summer of 2022, the city received a state grant to help support the education and outreach aspects of SB 1383, which was administered through our Joint Powers Authority (JPA), Zero Waste Sonoma. The city partnered with the majority of other Sonoma County jurisdictions to bulk purchase 2,700 kitchen pails designed to collect residential food scraps and to transfer these scraps to the curbside organics cart. The



city launched its *Compost It Sonoma!* campaign in September 2022 to distribute these pails. The city partnered with Sonoma Garbage Collectors, Refill Madness Sonoma, Sonoma Community Center, and City Hall to distribute the free pails. The campaign included PSAs, print and online advertisements in the Sonoma Valley Sun and Sonoma Index Tribune, two staff written editorials, and free giveaway events at Friedman's Home Improvement in December 2022 and the Tuesday Farmer's Market in July 2023. By November 2023, the city had distributed 94% of its kitchen pails.

As shown in Figure 5-3, the state law, city ordinance, and education and outreach campaign collectively have provided positive results. The landfill diversion rate, which is the total weight of segregated recycling and organics (no longer being landfilled) divided by the total amount of MSW generated, has increased by 19.2% since 2014. The city's landfill diversion rate is shown in Figure 5-3. The increase in organics (food waste and yard waste combined) collected between 2021 and 2022 increased by 873 tons (35%) while the amount of trash collected simultaneously decreased by 967 tons (16%).

²⁷ <https://www.sonomacity.org/sort-it-sonoma>

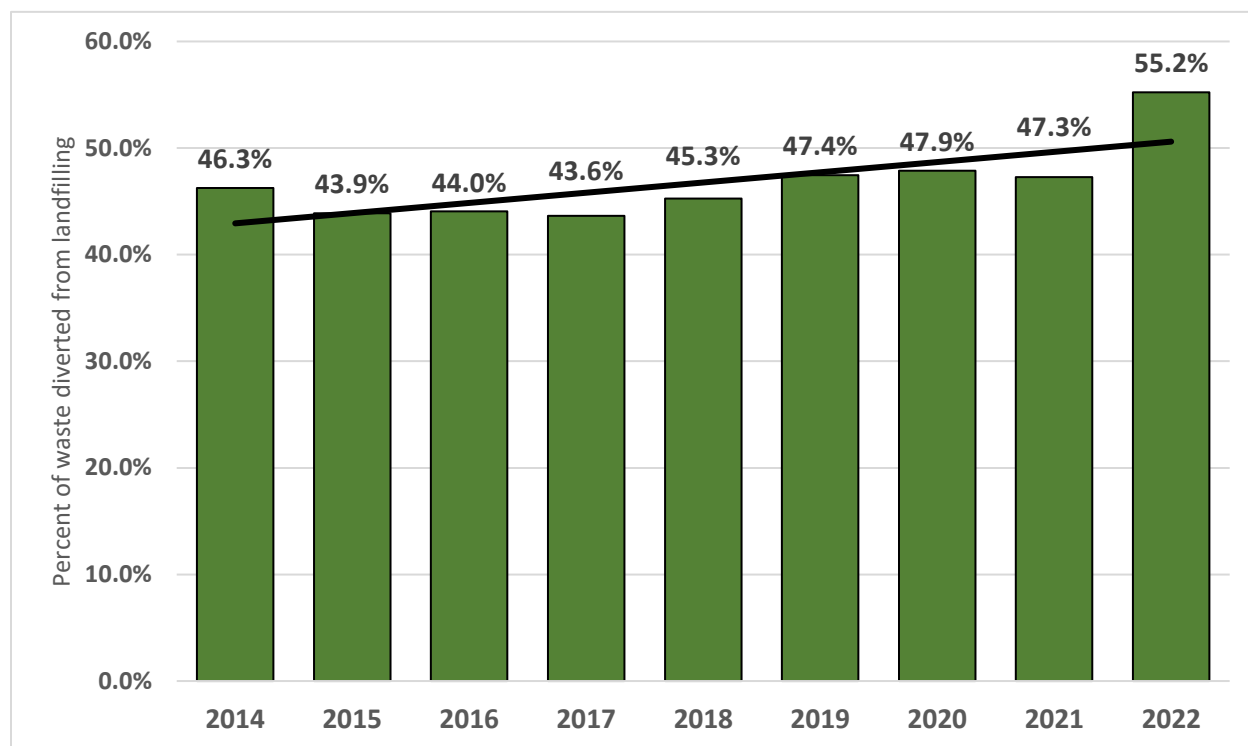


Figure 5-3. Sonoma’s landfill diversion rate, 2014-2022.

5.2 Minimization of Solid Waste/Zero Waste

On October 19, 2020, the City Council adopted a resolution to achieve a goal of zero waste by 2030. The resolution called for reducing the daily per capita amount of solid waste disposed of by at least 10% each year. In addition, it called for expanding and developing ordinances to reduce distribution of single-use products such as plastic bags not covered by current policy.

On April 19, 2021, the City Council adopted a new disposable food serviceware ordinance, which became effective on October 16, 2021. The ordinance requires covered businesses to stop using or selling food serviceware that is not recycled or composted in the city. This ordinance is intended to further help reduce landfilling of organics (paper-based packaging) and thus the associated methane GHG emissions as well as petroleum-based single use packaging. Also, chopsticks, napkins, plastic straws, plastic lids, and condiments packets may be provided to customers only upon their request, which is designed to reduce distribution of unnecessary or unwanted single use items. Events requiring a permit for the Plaza or Depot Park must adhere to the Special Events Policy, which also includes an additional prohibition on the distribution of plastic straws and plastic water bottles.

5.3 Recommended Solid Waste Actions

Table 5-1 lists recommended climate actions that have been adopted by other jurisdictions that are applicable for solid waste minimization in Sonoma for.

The climate actions that appear in *italics* in Table 5-1 (in the **Action** column), are recommended by the CAC as priority climate actions.

Table 5-1: Recommended actions for solid waste.

Title	Action	Summary
SW-1 Increase Organic Materials Segregation	Offer Discounted Residential Backyard Composters	Increase backyard composting by offering discounted home composters and composting workshops.
	Update the Solid Waste Franchise Agreement	Modify the city solid waste franchise agreement to improve segregation through improved signage, labels, colored containers, and education and outreach.
	<i>Increase Zero Waste Practices</i>	Adopt and implement practices to reduce the generation of waste and increase recycling and composting.
SW-2 Decrease Consumption of Plastic Shopping Bags	Adopt a Plastic Bag Ordinance	Close loopholes in the state single-use plastic bag law.
	<i>Enforce State Bag Fee Requirement</i>	Enforce state fee requirement for distribution of plastic shopping bags.
SW-3 Reduce Single Use Plastic Water Bottles	Increase the Number of Water-Bottle Filling Stations	Install water-bottle filling stations at the Plaza, Depot Park, Petanque/Bocce Courts, and Olsen Park.
SW-4 Increase Use of Compliant Food Serviceware	Increase Use of Compliant Items at Special Events	Require all food serviceware items used for Special Events to be purchased through a city contract.
	<i>Enforce City's Ban on Disposable Food Serviceware</i>	Enforce city's ordinance banning non-recycled and non-compostable food serviceware.

5.3.1. Increase Organic Materials Segregation

Offer Discounted Residential Backyard Composters – Expanding backyard composting would decrease the amount of organic materials transported for offsite composting and then transported back to the city as compost. This would also decrease transportation related GHGs. To expand backyard composting, the city would offer discounted backyard composters to city residents. For example, the average retail price for a standard backyard composter is about \$130. The city could bulk purchase these containers for delivery to Sonoma for a discounted \$70 each when

purchasing 100 composters. In this case, the only cost to the city would be administrative costs to purchase, distribute, receive, and process the payments. To reduce city costs in implementing the program, the city could partner with a local retailer to distribute subsidized composters through a residential coupon program. Advertising the program would be through trash bill inserts, which is an added cost.

To support this effort and improve composting practices for current composters, the city should sponsor a series of hand-on composting workshops. An approximate cost for four workshops would be \$1,000.

CalRecycle will be providing \$75,000 in grant funds to support SB 1383 in the spring of 2024. It would be appropriate to use some of these funds to further decrease the cost of composters and/or support delivery of backyard composting workshops.

Update the Solid Waste Franchise Agreement – The city should modify the solid waste franchise agreement to require the franchised hauler to improve segregation of organic materials, and recyclable materials, through improved signage, labels, and colored containers. In addition, there should be an increase in active education and outreach as well and improvements to the hauler’s website and social media outreach to promote the *Sort It Sonoma!* program.

5.3.2 Decrease Consumption of Plastic Shopping Bags

Adopt a Plastic Bag Ordinance - In 2016, California passed Proposition 67 that bans the distribution of single use plastic bags (less than 2.25 mm thick). However, stores may distribute “reusable” plastic bags if they charge customers a separate and visible fee (¢10) for each bag (the ¢10 fee also applies to distributing paper bags). The ban was temporarily suspended by the governor during the Covid 19 public health emergency but has been reinstated. However, reports and direct observations have noted that stores continue to distribute “reusable” plastic bags while continuing to waive the fee. Research also indicates that fewer than 1% of customers reuse the thicker “reusable” plastic bags. Plastic bags can only be recycled if they are returned to a store and placed into the dedicated plastic bag recycling container (they are prohibited from being placed into the blue recycling carts), but only a small portion of bags is collected, otherwise they are landfilled.

The 2.25 mm standard has been found to be a loophole. To close this loophole, the city should pass an ordinance that bans the distribution of any plastic bag less than 4 mm. Nationally, local ordinances increasingly have been establishing 4 mm as the minimum for a reusable plastic bag as a means to close the “reusable” loophole.²⁸ It should be noted that in September of 2022,

²⁸ Wagner, T. P. (2017). Reducing single-use plastic shopping bags in the USA. *Waste Management*, 70, 3-12.

Governor Newsom signed SB 1046 that bans the thin “pre-checkout” plastic produce bags statewide starting in 2025. These bags will instead have to be compostable or paper. The city should adopt this requirement sooner than 2025.

Enforce State Bag Fee Requirement – Currently there is no state enforcement of the state-required bag fee under California Proposition 67. Under this law, cities, counties, and the state have authority to enforce the bag ban. Currently, neither Sonoma County, our JPA, nor the City of Sonoma are enforcing this law. It is recommended that the city start enforcing this law. In doing so, there is a direct benefit to retailers as the law allows them to keep the collected fees.

5.3.3 Reduce Single Use Plastic Water Bottles

Add More Water-Bottle Filling Stations – The use of conveniently located water bottle filling stations decreases generation and disposal of single-use plastic water bottles. Currently, the city has only one bottle-filling station on public property-- the west side of the Plaza. The city has grant funds available from Zero Waste Sonoma to increase the number of bottle-filling stations. The recommendation is to install water bottle filling stations in front of the public restrooms on the Plaza, near the public restrooms in Depot Park, at the Petanque/Bocce Courts, and in Olsen Park adjacent to the Sonoma City Trail.

5.3.4 Increase the Use of Compliant Food Serviceware

Increase Use of Compliant Items at Special Events – It is recommended that all vendors permitted to operate at Special Events be required to purchase all food serviceware items through the city. By controlling purchasing, the city can ensure all food serviceware is compliant with the city’s ordinance and the Special Events policy. It is recommended that the city work with a food serviceware supplier to develop a list and negotiate a bulk purchase price. Vendors would be required to only purchase items from the list. In addition, the city can seek to lower vendor’s cost through the bulk purchase negotiation.

Enforce City’s Ban on Disposable Food Serviceware – Currently, the city is not enforcing its ordinance banning the distribution of non-recycled and non-compostable food serviceware. It is recommended that the city commence enforcement.

5.4 Implementation of Climate Actions for Solid Waste

This section outlines a potential strategy to implement each category of solid waste-related climate actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will be likely including initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months). Regarding GHG reduction potential, in the absence of specific reduction data, relative, qualitative categories for potential reduction in GHG emissions relative to the specific category (not total community GHG reductions) are used for comparison purposes including none (0%), low (1-10%), moderate (11-24%), and high (25% or greater).

SW-1 Increase Organic Materials Separation					
Develop a discounted residential backyard compost program and update the solid waste franchise agreement.					
Target Year	Performance Metric				GHG Reduction Potential
2024	<ul style="list-style-type: none"> Distribute 100 backyard composters Increase organics diversion by weight 				<ul style="list-style-type: none"> Low Medium
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced fuel costs and tipping fees for solid waste hauler. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Coordinate with Zero Waste Sonoma on the SB 1383 grant. Assess potential for bulk purchase of composters with other Sonoma County jurisdictions. Draft and submit to hauler organics separation requirements for solid waste franchise agreement. 				
City Costs	<ul style="list-style-type: none"> Staff time required to write, administer and distribute composters. Staff time to modify and negotiate solid waste franchise agreement. 				
Community Cost	There will be a small fee (~\$25-\$70) for backyard composters. Solid waste fees will increase after incorporating SB 1383 related requirements.				
Funding Opportunities	CalRecycle will provide the city with a \$75,000 grant to support organics diversion projects.				

SW-2 Decrease Consumption of Plastic Shopping Bags					
Adopt a plastic bag ordinance and commence enforcement of the state bag fee requirement.					
Target Year	Performance Metric				GHG Reduction Potential
2024	Reduction in single-use plastic bags distributed by retailers.				Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced ground and surface water litter. Improved recycling quality and reduced tipping fees for solid waste hauler. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Research model ordinances that ban distribution of “reusable” plastic bags that are not reused. Write Sonoma-specific ordinance. Develop a work plan for code enforcement to begin enforcement of the state bag fee requirement. 				
City Cost	<ul style="list-style-type: none"> Staff time to research and prepare modifications to ordinance. Staff time for Code enforcement time to begin enforcement. 				
Community Cost	There are no known community costs.				
Funding Opportunities	None known at this time.				

SW-3 Reduce Single Use Plastic Water Bottles					
Starting in calendar year 2024, install 5 additional water bottle filling stations on public property					
Target Year	Performance Metric				GHG Reduction Potential
2024	Active use of water bottle filling stations. Decrease in plastic water bottles generated.				Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced ground and surface water litter. Reduced tipping fees for solid waste hauler. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Identify suitable locations. Obtain grant funds from Zero Waste Sonoma and purchase water bottle filling stations. Install stations. 				
City Costs	<ul style="list-style-type: none"> Staff time to research and select water bottle filling station. Additional funds may be needed for installation if the grant cannot cover full cost. 				
Community Cost	There are no known community costs.				
Funding Opportunities	Zero Waste Sonoma				

SW-4 Increase Use of Compliant Food Serviceware					
Starting in calendar year 2024, increase use of compliant food serviceware at special events and begin enforcement of the city's ban on disposable food serviceware.					
Target Year	Performance Metric				GHG Reduction Potential
2024	<ul style="list-style-type: none"> Reduced distribution of non-compliant food serviceware. Begin enforcement of city's ban on non-compliant food serviceware 				<ul style="list-style-type: none"> Low Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Reduced ground and surface water litter Reduced tipping fees for solid waste hauler Potentially lower costs to vendors through bulk purchase of food serviceware 				
Basic Implementation Steps	<ol style="list-style-type: none"> Identify compliant food serviceware. Develop a purchase and distribution system for vendors. Explore the suitability of the Zero Waste Sonoma grant. Develop a work plan for code enforcement to begin enforcement. 				
City Costs	<ul style="list-style-type: none"> Staff time to research and select compliant food serviceware and staff time to administer program. Code enforcement time to begin enforcement. 				
Community Cost	There are no known community costs.				
Funding Opportunities	Zero Waste Sonoma Reuse Grants CalRecycle SB 1383 Organics Separation Grant				

6. Water

0.26% of Sonoma's GHG emissions

Climate Strategy Goals:

- Reduce water leaks.
- Reduce irrigation use.
- Harvest and use rainwater.

Although water/wastewater accounts for a very small amount of GHG emissions in Sonoma (<1%) reducing the consumption of water has a significant co-benefit of conserving a scarce resource in Sonoma County.

6.1 Water Conservation Efforts

The city has had an extensive water conservation program in place for many years. For example, the city has issued “leak letters” to customers when a potential leak is indicated. These can be accompanied by an optional in-person visit to provide water conservation recommendations. Since 2009, the city has been giving away water conservation devices and kits that include low-flow shower heads, faucet aerators, shower timers, shower buckets, and leak detection dye tablets. The city has had a turf removal rebate program since 2014, which seeks to remove turf and reduce the need for irrigation.

Figure 6-1 depicts the water consumption in the City of Sonoma (in acre feet) by single family residents, multi-family residents, commercial and institutional customers, landscape irrigation, and other (fire protection and street cleaning). Since 2018, the per capita consumption of water has increased by 1.85%. In 2022, single family residential customers accounted for 80% of all water consumed. Starting in 2021, recycled water was used as part of the supply (<0.1%) specifically for irrigation.

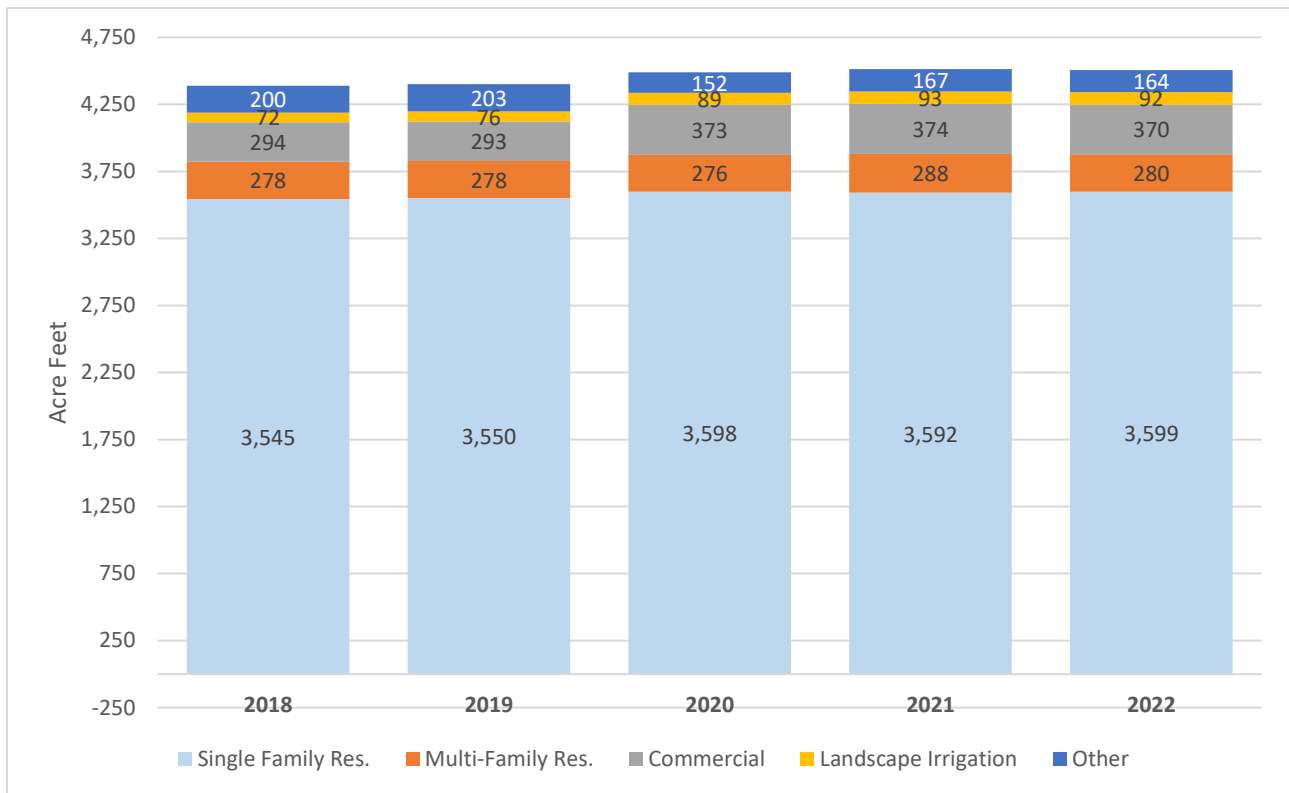


Figure 6-1. Sonoma's water consumption, 2018-2022.

6.2 Recommended Water Related Actions

Table 6-1 lists recommended climate actions that have been adopted by other jurisdictions for water that are applicable in Sonoma.

The climate actions that appear in *italics* in Table 6-1 (in the **Action** column), are recommended by the CAC as priority climate actions.

Table 6-1: Recommended actions for water.

Title	Action	Summary
W-1. Reduce Use of Irrigation	<i>Expand and Modify Cash for Turf Program</i>	Expand the cash for turf program to increase the replacement of irrigated turf in the city.
	<i>Encourage Use of Rainwater Capture Systems on Private and Public Properties</i>	Offer rain barrels to residents at a discounted price to increase the capture of rainwater. Install effective rainwater capture and reuse systems at city facilities.
	Prepare and Implement a Community Based Social Marketing Plan	Develop a community based social marketing plan to achieve behavior change with water conservation.
W-2. Install Real Time Monitoring of Water Consumption	Install Advanced Water Metering Infrastructure <i>Encourage Water Conservation by High Users</i>	Advanced Metering Infrastructure uses new generation meters to provide real time data on water consumption.

6.2.1 Reduce Use of Irrigation

Expand and Modify Cash for Turf Program - The city offers cash rebates for customers who remove turf thereby reducing the need for irrigation. Residential rebates are \$1.00 per ft² of removed turf for a maximum of \$1,000; commercial customers and homeowner associations (HOAs) can receive rebates of \$1.00 per ft² for a maximum of \$3,000. While the program has been successful, this program should be improved by adopting a progressive fee schedule. For example, instead of a flat per ft² fee, the city would adopt a progressive fee (e.g., \$1 per ft² for 1-299 ft² removed, \$1.25 for each ft² when 300-499 ft² are removed, and \$1.50 for each ft² when 500-999 ft² are removed, and so forth). Another option would be to modify the program to offer rebates on linear footage of irrigation systems removed.

Offer Discounted Residential Rain Capture Barrels - Rain barrels allow residents to collect and store up to 55-gallons per rainwater barrel to be used at a later time. This action reduces the consumption of public water, conserving both water and energy. The harvested rainwater can be used for lawn and garden watering, topping off pools, and washing vehicles. As a co-benefit, rainwater harvesting helps to divert rain from storm drains thereby reducing the impact of stormwater runoff.

A typical 55-gallon rain barrel costs about \$140. The city would bulk purchase (e.g., 200 units) rain barrels (at a lower retail cost) and offer them at approximately 50% less than the retail price (e.g., \$70). This would cost the city only minimal administrative costs to order and manage distribution and collect and process payments. To reduce city costs in implementing the program,

the city could partner with a local retailer to distribute subsidized rain capture barrels through a residential coupon program. Advertising the program would be through water bill inserts, an added cost.

Rainwater Capture Systems at Government Buildings – To reduce irrigation, the city should install largescale rainwater capture and reuse systems at select city buildings. The highest priority locations are the Police Department/City Council Chambers and Corporation Yard.

Prepare and Implement a Community Based Social Marketing Plan - The premise of Community Based Social Marketing (CBSM) is that traditional education and outreach are ineffective in achieving behavior change (e.g., an action, practice, or purchase) for two primary reasons: (1) Status quo bias—the default behavior for people remains the status quo with education alone insufficient to overcome this barrier. (2) The 20-60-20 rule states that on average, 20% of the community is supportive of water conservation actions and just need information, 20% will not change their behavior for a variety of reasons, and 60% are interested and/or sympathetic but only if the action is convenient and/or there are economic incentives to act to overcome perceived inconvenience. To reach 60%, CBSM combines psychology and social marketing to achieve the specific desired behavior change by employing multiple behavior change tools to overcome inconvenience and other barriers while also offering incentives.

CBSM plans have been used successfully throughout the world for water and energy conservation, recycling, and to achieve other pro-environment actions. The city should consider developing a CBSM plan focused on a specific water conservation action, such as reduced lawn irrigation. (A preliminary draft CBSM for water conservation has been prepared.) The first steps in CBSM planning are to identify the goal, target population, objective, and desired action (e.g., no irrigation, irrigate every other day, switching to a smart automatic watering system, etc.). The next step is to identify barriers to action: Why do people not engage in the desired water conservation action? Finally, a plan is prepared and implemented using CBSM strategies including commitments, nudging, social norms, social diffusion, prompts, incentives, and convenience.

6.2.2 Install Real Time Monitoring of Water Consumption

Install Advanced Water Metering Infrastructure – Advanced Metering Infrastructure (AMI) uses new generation meters that provide remote, real-time access to water use data, allowing customers to monitor their water usage without having to rely on quarterly water bills. Notification messages can be sent automatically to identify usage spikes or possible leaks and provide early leak detection for quicker repairs thus reducing wasted water.

6.3 Implementation of Climate Actions for Water

This section outlines a potential strategy to implement each category of water-related climate actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will be likely including initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months). Regarding GHG reduction potential, in the absence of specific reduction data, relative, qualitative categories for potential reduction in GHG emissions relative to the specific category (not total community GHG reductions) are used for comparison purposes including none (0%), low (1-10%), moderate (11-24%), and high (25% or greater).

W-1 Reduce Use of Irrigation					
Institute a program to reduce the use of irrigation.					
Target Year	Performance Metric				GHG Reduction Potential
2024	<ul style="list-style-type: none"> Expand and modify the Cash for Turf program. Offer discounted residential rain capture barrels. Install largescale rainwater capture systems at government buildings. Prepare and implement a community based social marketing program for water conservation. 				<ul style="list-style-type: none"> Low Low Low Low
Implementation Details					
Implementation Timeline	Short-term	Start Year	2024	Completion Year	2024, and ongoing
Co-Benefits	<ul style="list-style-type: none"> Increased conservation of water Reduced water supply costs Reduced stormwater runoff 				
Basic Implementation Steps	<ol style="list-style-type: none"> Develop plan and strategy to expand Cash for Turf program. Develop plan and seek potential partner to distribute discounted rainwater capture barrels. Develop and issue RFP for construction of largescale rainwater capture systems. Complete development of the draft CBSM plan and pilot test strategy. Based on the pilot test, finalize and implement the CBSM plan. 				
City Costs	<ul style="list-style-type: none"> Staff time required to revise Cash for Turf program. Staff time to research, implement, and administer the rain barrel program, \$12,000 estimate to purchase and distribute discounted barrels. Staff time to prepare and issue an RFP. Installation of 2 largescale rainwater capture systems would be approximately \$50,000. Staff time to prepare and implement a community based social marketing plan. 				
Community Cost	A reduced cost (~\$70.00) for those interested in purchasing a rain capture barrel.				
Funding Opportunities	EPA Water Quality Grants				

W-2 Install Real Time Monitoring of Water Consumption		
Install advanced water metering infrastructure.		
Target Year	Performance Metric	GHG Reduction Potential
2024	Percentage of water meters with Advanced Water Meter	Low
Implementation Details		

W-2 Install Real Time Monitoring of Water Consumption					
Implementation Timeline	Medium-Term	Start Year	2024	Completion Year	2026, and ongoing
Co-Benefits	<ul style="list-style-type: none"> • Increased conservation of water • Fewer water leaks • Reduced water supply costs • Improved billing for water service 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Prepare and publish RFP for installation of the system. 2. Begin installation. 				
City Cost	<ul style="list-style-type: none"> • Staff time to prepare and administer RFP for purchase and administration of contract. • \$2,000,000 in capital costs to install the Advanced Water Metering Infrastructure. 				
Community Cost	None known at this time.				
Funding Opportunities	None known at this time.				

DRAFT

7. Government Operations

0.35% of Sonoma's GHG emissions

Climate Strategy Goals:

- Improve energy conservation and efficiency of government buildings.
- Increase electrification of government buildings.
- Electrify municipal vehicle fleet and equipment.
- Expand and enhance PV solar production on government buildings.

Sonoma's government operations totaled 311 MT CO₂e. While this accounted for a very small proportion (only about 0.35%) of total GHG communitywide emissions, the City Council included government operations as part of city's target of no net GHG emissions by 2030. Similar to communitywide emissions, municipal government 2018 GHG emissions were dominated by transportation (91% of the total). In contrast, buildings, streetlights, and water/sewer together accounted for only 9% of these emissions but decreased 89% decrease between 2018 and 2000. During the same time period transportation GHGs decreased 30.8%.

7.1 Using Low Carbon Electricity Supply

Sonoma's government operations switched to Sonoma Clean Power's EverGreen program—the first jurisdiction in Sonoma County to do so. This program is 100% local renewable power (geothermal and solar) that produced 70 lbs CO₂/MWh in 2022, 90% less than the state average.

7.2 Energy Efficient Lighting Upgrades

In 2015, the city replaced 1,100 energy inefficient streetlights with energy efficient LED fixtures reducing annual CO₂ emissions by 180,000 lbs. In May 2022, the city completed another lighting efficiency upgrade project replacing older, inefficient interior and exterior lighting in city-owned buildings with higher efficiency LED lighting. This was done at the City Hall, Carnegie Library, Police Department, and Corporation Yard. The upgraded lighting will save an estimated 50,000 kWh per year and its associated GHGs. In addition, the lighting will save the city approximately \$14,000 per year in energy costs while also reducing future labor costs as LED lights last

significantly longer thereby reducing the labor needed to replace lamps. Finally, the mercury contained in the replaced fluorescent lighting was safely removed and managed.

In addition to free technical assistance to assess energy efficient projects at municipal buildings, the lighting upgrade project was financed through a zero-interest, bill-neutral loan. This means the monthly savings in the city's energy bill from the more efficient lighting will be applied to repaying the loan. After the loan is repaid, in about 4 years, the city will benefit from the ongoing cost savings through reduced energy bills.

7.3 PV Solar Power Installation

In 2010, a PV Solar system was installed on the Police Department Building with a listed output of 52.4 kW. Between 2017 and 2020, the average power produced by this system has been 82.47 MWh. (The Envoy reporting unit on this PV system is no longer operational.) In 2011, a PV Solar system was installed on the Public Works Building at the Corporation Yard with a listed output of 20.2 kW. Between 2016 and 2018 (the Envoy reporting unit here ceased operating in early 2019), the average power produced by this system was 30.47 MWh.

Assuming a standard 1% annual degradation in electricity generation for the PV solar systems, the city currently has an estimated, combined 65.3 kw of electrical output; by 2030, the current system will be producing an estimated 58 kw. If a larger system were to be installed or current panels and inverters upgraded this action could compensate for GHG emissions from buildings, municipal fleet, and employee commuting. However, with a general life expectancy of PV panels of about 20-25 years, the 72.6 kw installed in 2010 will be close to the end of its operating life in 2030, meaning this production will have to be replaced.

7.4 Environmentally Preferable Procurement Policy

In November 2021, the City Council adopted a new Environmentally Preferable Procurement Policy to comply with state-imposed requirements (SB 1383) to annually procure recovered organics (e.g., compost and mulch) and recycled paper and paper products. In addition, the policy seeks to reduce upstream and downstream emissions through smart purchasing, reduce energy consumption in municipal buildings, and promote electrification of the city's on-road and off-road vehicle fleet. Annual procurement of recovered organics by the city as mandated by the state under SB 1383 supports carbon sequestration.

7.5 Recommended Actions for Government Operations

Table 7-1 presents a list of recommended actions that have been adopted by other jurisdictions for government operations and are appropriate for Sonoma.

The climate actions that appear in *italics* in Table 7-1 (in the **Action** column), are recommended by the CAC as priority climate actions for government operations.

Table 7-1: Recommended actions for government operations.

Title	Action	Summary
G-1. Implement Energy Conservation Measures in City Buildings	<i>Conduct Energy Conservation Audits of City Buildings</i>	Contract with an energy company to conduct an investment-grade energy conservation/weatherization audit of municipal buildings.
	<i>Replace Ineffective Window Sash Locks</i>	Replace the ineffective window sash locks in City Hall and seal leaks in the building envelope.
	<i>Install Vacancy Lighting Sensors</i>	Install vacancy lighting sensors in all appropriate rooms in municipal buildings.
	Install HVAC Zones in City Hall and Carnegie Library	Install zones in the heating and cooling systems of City Hall and Carnegie Library.
G-2 Upgrade and Expand PV Solar	Upgrade Current PV Solar Arrays	Examine current operational status of the existing PV solar arrays at the Police Station and Corp Yard to assess replacement and upgrade of non-working microinverters to increase power production.
	<i>Expand PV Solar on Municipal Buildings</i>	Assess expansion of rooftop PV solar on all appropriate municipal buildings.
	<i>Assess Potential Areas to Install PV Solar Parking Canopies</i>	Assess potential to construct solar parking canopies at the Corp Yard and Police Department parking lots.
G-3. Electrify City Vehicles and Equipment	<i>Prepare City Fleet and Equipment Electrification Plan</i>	Develop a plan to electrify the city's fossil-fuel powered fleet and equipment.
	<i>Install EV Charging at City Facilities</i>	Install EV charging for city employees and fleet vehicles.
G-4. Replace Natural Gas Fired Equipment	<i>Replace Gas-Fired Water Heaters</i>	Replace the gas-fired water heaters at City Hall, Carnegie Library, Corp Yard, and Fire Station with efficient electric hot water systems.
	Replace Gas-Fired HVAC System at the Police Department	Replace the gas-fired HVAC system at the Police Department with a high efficiency all-electric system (e.g., zoned heat pumps).

7.5.1 Implement Energy Conservation Measures in City Buildings

Conduct Energy Conservation Audits of City Buildings - A critical step in reducing a building's energy consumption is to conduct an investment-grade energy audit specifically to identify feasible energy conservation opportunities. This action would require the services of a

professional energy auditor and would entail identification and assessment of energy losses and include remediation steps and their estimated costs. An investment-grade building energy conservation audit typically includes an examination of windows, doors, walls, attics, crawlspaces, and eaves, to identify any leaks in the building envelope that are causing avoidable losses or gains of heat or cooled air and include the following:

- Use infrared cameras and blower doors to identify leaks, thermal bridges, and insufficient insulation.
- Visually inspect insulation on all piping, ducting, and equipment for damage including tears, compression, stains, and so forth.
- Identify and plug air leaks with weather stripping, foam insulation, and caulking.
- Calibrate thermostats to ensure their ambient temperature readings are correct and to adjust temperature set points for seasonal changes.
- Analyze the efficacy of blocking direct heat gain from the sun shining through glass with solar screens, solar films, and awnings.
- Assess and repair damaged wall and attic insulation and replace missing insulation with the thickness calculated for the operating and ambient conditions of the mechanical system.
- Install reflective roof coatings to reduce energy consumption.

Replace Ineffective Window Sash Locks - The improperly installed window sash locks in City Hall should be replaced with “tight seal” sash locks. Approximately 45 single-hung windows in City Hall have noticeable gaps between the two panels because of inadequate locking. Replacement of the sash locks would cost about \$275 plus labor (about 4 hours) and save approximately 5% in heating and cooling costs. In addition, visible gaps can be seen around some of the arch windows in City Hall, which can be sealed with caulk. This action could eliminate the need for the currently used electrical space heaters in the downstairs restrooms. Two other co-benefits of this action would be to reduce outside noise penetration during working hours and reduce dust and dirt intrusion, which are visible on the windowsills. Other municipal buildings have not been assessed for the adequacy of their window sash locks but should be.

Install Lighting Vacancy Sensors - Vacancy sensors require users to turn lights on manually but automatically shut off when users exit the room. These are appropriate for offices, storage rooms, bathrooms, meeting rooms, and other low-traffic areas. Occupancy sensors can save between 15-20% on lighting related electricity consumption. While some buildings have occupancy sensors, a staff-led audit would be conducted to identify additional suitable locations. For example:

- City Hall - Interior lighting is controlled by manual switches.

- Carnegie Library - Interior lighting is controlled by manual switches.
- Corp Yard, Main Building- Lighting in all spaces is controlled by manual switches.
- Corp Yard, Office – Lighting in offices, restrooms, and conference room lighting is controlled by occupancy sensors, the lobby area is manually controlled.
- Police Department - Office spaces have Wall Mount Occupancy sensors, but the remaining spaces are manually controlled.

Install HVAC Zones in City Hall and Carnegie Library - Currently there are too few thermostats/zones in City Hall and Carnegie Library. For example, the top floor of the Carnegie Library is shared between the Sonoma Valley Visitors Bureau and the City's Finance Department. The Finance Department's offices are in a suite that is physically separated (locked doors) from the Visitors Bureau, but the thermostat is located in the Visitors Bureau area, which results in one side being too hot or too cold. Installing a separate zone with a dedicated smart thermostat would reduce the comfort imbalance and reduce the consumption of energy as closed offices would not be heated or cooled. (While the Visitors Bureau is open during the weekend, the Finance Department is not.) This same heating/cooling imbalance occurs in City Hall, which means some unoccupied or under-used spaces are heated or cooled.

7.5.2 Upgrade and Expand PV Solar

Upgrade Current PV Solar - As presented earlier in this document, the PV solar systems installed at the Police Department and Corp Yard are now nearly 13 years old. Generally, PV systems degrade (loss of power production) by 1% per year. In addition, because of non-functioning Envoy units, which record and report power production and the operational status of the microinverters, staff is unable to assess the systems' power production status. (The first step would be to replace the Envoy units at a cost of \$1,500 for the two systems.) At present, these PV systems may not be producing their rated output because of malfunctions.

It is recommended that the city contract with a solar company to examine the current operational status of the existing PV solar arrays at the Police Station and Corp Yard to assess replacement/upgrade of non-working or inefficient microinverters to increase power production. An estimate of the potential need for replacement and upgrading of the existing system is necessary.

Expand PV Solar on Municipal Buildings - Based on a preliminary report prepared under the BayREN's Municipal Zero Net Energy/Zero Net Carbon Technical Assistance Program, the city has additional capacity for PV solar panels on existing building roofs at the Police Department, Corp Yard, Fire Department, and Carnegie Library. Expanding the number of PV solar panels would increase onsite, zero carbon energy. The city should assess expansion of rooftop PV solar on all appropriate municipal buildings, which would require the services of a professional solar company.

Assess Potential Areas to Install PV Solar Parking Canopies - An assessment should be made for the potential to construct solar canopies, similar to those installed at Sonoma Valley High School, at the Corp Yard, Fire Department, and Police Department parking lots. A significant co-benefit of canopies is that they provide shade during summer months for vehicles, which reduces the demand for air conditioning and reduces the solar gain and temperature of parking surfaces (thereby reducing the heat island effect). An additional co-benefit of installing parking solar canopy structures is their ability to provide EV charging opportunities, which is especially relevant for the eventual electrification of the city's fleet (see below).

7.5.3 Electrify City Vehicles and Equipment

Prepare City Fleet and Equipment Electrification Plan - In November 2021, the City Council adopted a new Environmentally Preferable Procurement (EPP) Policy, which applies to all government operations, employees, and vendors. In Section 8 of the EPP Policy, Fleet Electric Vehicles, Off-Road Equipment, and Maintenance Equipment, the city committed to procure battery electric, hydrogen fuel cell, or plug-in hybrid vehicles, in-lieu of fossil fuel consuming internal combustion vehicles and other specified vehicles (through purchase or leasing), when available in a comparable vehicle class where programmatically and financially feasible. While a fleet electrification plan has not yet been developed, staff recently completed an inventory of the city's vehicles and equipment and the expected service life of each vehicle and piece of equipment. The next step is to create a plan to replace fossil fuel-powered vehicles and equipment with electric battery EV, plug-in hybrid, or hydrogen fuel cell powered. A critical step is to simultaneously assess the charging infrastructure requirements and capabilities of the Corp Yard and Police Department.

Install EV Charging at City Facilities - The city should install non-networked, L2 workplace chargers at city facilities for city employees, authorized visitors on city business, and for the municipal fleet. Installing non-networked chargers restricted to employees/official visitors at the Corp Yard, City Hall, and Police Station would cost much less than installing public EV stations because of reduced features needed to track and process payments. Installing EV chargers at city facilities would also support electrification of the city's own vehicle fleet as EV chargers would serve a dual purpose of serving employees during the day would charge city-owned on-road and off-road vehicles during non-business hours.

7.5.4 Replace Natural Gas Fired Equipment

Replace Gas-Fired Water Heaters - The city has three small natural gas-fired water heaters at City Hall and the Carnegie Library and larger natural gas hot water heaters at the Corporation Yard and Fire Department. The restroom faucets in the Corp Yard are currently served by a 27-gallon, gas-fired domestic water heater. These gas-fired water heaters should be replaced with either an on-demand, electric water heater (for small bathrooms) or a heat pump hot water system

for the Corp Yard, which is significantly more efficient. Rebates available from Sonoma Clean Power and BayREN would significantly reduce the purchase costs.

Replace Gas-Fired HVAC System at the Police Department - The Police Department gas-fired HVAC system is the largest user of natural gas in the municipal building stock. A study should be conducted to assess the feasibility and cost/benefits of replacing this system with a high efficiency all-electric system. Replacing this system would be a major capital expenditure of approximately \$250,000.

7.6 Implementation of Climate Actions for Government Operations

This section outlines a potential strategy to implement each category of government operations-related climate actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will be likely including initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months). Regarding GHG reduction potential, in the absence of specific reduction data, relative, qualitative categories for potential reduction in GHG emissions relative to the specific category (not total community GHG reductions) are used for comparison purposes including none (0%), low (1-10%), moderate (11-24%), and high (25% or greater).

G-1 Implement Energy Conservation Measures in City Buildings					
Complete energy conservation audits of all city buildings and implement energy conservation measures.					
Target Year	Performance Metric			GHG Reduction Potential	
2024	• Reduction in energy consumed in city buildings			• Low	
Implementation Details					
Implementation Timeline	Medium-Term	Start Year	2024	Completion Year	Ongoing
Co-Benefits	<ul style="list-style-type: none"> • Lower energy costs. • Increased worker comfort. 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Prepare and publish an RFP for commercial energy conservation audits. 2. Purchase and replace the ineffective window sash locks. 3. Purchase and install vacancy lighting sensors. 4. Prepare and publish an RFP for the installation of HVAC zones. 				
City Costs	<ul style="list-style-type: none"> • Staff time to prepare and administer two RFPs. • \$10,000 to conduct energy audits, \$400 to replace window sash locks, \$3,000 to install vacancy lighting sensors, and \$25,000 to install HVAC zones. 				
Community Cost	None known at this time.				
Funding Opportunities	California Energy Commission's Energy Conservation Assistance Act California Energy Commission's Energy Partnership Program				

G-2 Upgrade and Expand PV Solar					
Begin thorough assessment of existing and future PV solar potential on government buildings and begin upgrading and expanding.					
Target Year	Performance Metric				GHG Reduction Potential
2024	• Percent increase in electricity generated by PV				• Medium
Implementation Details					
Implementation Timeline	Medium-Term	Start Year	2024	Completion Year	2026
Co-Benefits	<ul style="list-style-type: none"> • Lower energy costs • Ability to electrify city's fleet 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Prepare and publish RFP for PV solar consulting services. 2. Based on consultant's report, prioritize recommended actions. 				
City Costs	<ul style="list-style-type: none"> • Staff time to prepare and administer two RFPs. • \$1,500 to replace two Envoy units. • \$25,000 for a professional PV solar assessment. 				
Community Cost	None known at this time.				
Funding Opportunities	California Energy Commission's Energy Conservation Assistance Act California Energy Commission's Energy Partnership Program				

G-3 Electrify City Vehicles and Equipment					
Develop a plan to electrify the city's fleet and vehicles and install EV charging for city employees.					
Target Year	Performance Metrics				GHG Reduction Potential
2024	<ul style="list-style-type: none"> • Percent of city fleet electrified. • Percent of city's equipment electrified. • Hours of charging used for city employees. 				• Medium
Implementation Details					
Implementation Timeline	Short-, Medium-, and Long-Term	Start Year	2024	Completion Year	2025, and ongoing.
Co-Benefits	<ul style="list-style-type: none"> • Lower fueling, operation, and maintenance costs. • Increased life of vehicles and equipment. • Reduced operational vehicle noise in the community. 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Complete fleet and equipment life expectancy and replacement plan. 2. Contact area jurisdictions for recommendations. 3. Contact PG&E to assess grant potential for charging infrastructure options and costs. 				
City Costs	<ul style="list-style-type: none"> • Staff time to investigate grant options and prepare infrastructure and fleet/equipment electrification. • Cost for equipment and fleet replacement costs, which would occur anyways. • Costs for infrastructure upgrades and chargers, which may be covered by grants. 				
Community Cost	None known at this time.				
Funding Opportunities	PG&E Fleet Electrification Program Sonoma Clean Power				

G-4 Replace Natural Gas-Fired Equipment					
Create replacement plan for natural gas fired equipment with high efficiency electric equipment.					
Target Year	Performance Metrics			GHG Reduction Potential	
2024	<ul style="list-style-type: none"> Decreased number of natural gas fired items. Decreased amount of natural gas consumed by city operations 			<ul style="list-style-type: none"> Low to high 	
Implementation Details					
Implementation Timeline	Medium- to Long-Term	Start Year	2024	Completion Year	2026, and ongoing.
Co-Benefits	<ul style="list-style-type: none"> Decreased energy costs. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Purchase and install new energy efficient, electric hot water heaters. Prepare and publish an RFP for replacing the natural gas-fired HVAC system at the Police Station. 				
City Costs	<ul style="list-style-type: none"> \$8,000 plus staff time to replace the hot water heaters. \$250,000 to replace the HVAC system at the Police Department. 				
Community Cost	None known at this time.				
Funding Opportunities	None known at this time.				

DRAFT

8. Carbon Sequestration

Climate Strategy Goals:

- Create a local, voluntary carbon offset program.
- Increase distribution and application of compost.
- Expand and increase tree planting communitywide.
- Protect and enhance forested habitats.
- Explore emerging carbon sequestration technologies.

Regardless of the actions taken to reduce GHG gases, there will still be emissions. Consequently, to reach the city's target of reaching net zero GHG emissions by 2030, biological carbon sequestration (carbon storage in vegetation and soils) will be a critical component to the GHG emissions reduction actions. Carbon sequestration is the process of capturing, securing, and storing carbon dioxide and/or elemental carbon from the atmosphere, which can offset GHG emissions.

8.1 Sonoma's Land and Open Space Protection

Sonoma has 14 parks encompassing 79.15 acres and 2 open space preserves encompassing 98.75 acres. In addition to supporting recreation, these protected areas have varying degrees of habitat protection and enhancement. As discussed below, these protected areas also present opportunities to sequester carbon through tree plantings, designated "no-mow" areas, and the application of mulch and compost. Sonoma's inventory of parks and opens spaces include:

- Armstrong Park
- Depot Park
- Field of Dreams
- Hertenstein Park
- K.T. Carter Park
- MacArthur Park

- Madera Park
- Montini Open Preserve
- Nathanson Creek Park
- Nathanson Creek Demo. Garden
- Olsen Park
- Pinelli Park
- The Plaza
- Sonoma Garden Parks
- Sonoma Overlook Trail
- Sonoma Valley Oaks Park

8.2 Annual Procurement of Compost

State law (SB 1383) mandates that each jurisdiction annually procures compost based on the established target of 0.08 tons of compost per person in the city’s population. For Sonoma, this is currently about 880 tons/year. Initially, concerns arose in Sonoma County that jurisdictions would compete with each other and with local agricultural and winery operations for limited supplies of compost. Moreover, the city has limited physical space to apply this large amount of compost each year. Consequently, the all the jurisdictions of Sonoma County collectively agreed to serve as a primary procurement entity for compost through our JPA, Zero Waste Sonoma (ZWS). To avoid competing with or raising costs for agricultural and winery operations while still meeting the mandated procurement target, ZWS is subsidizing their procurement costs while retaining procurement credits for each jurisdiction.

8.3 Recommended Carbon Sequestration Actions

Table 8-1 presents a list of recommended actions that have been adopted by other jurisdictions for carbon sequestration and are appropriate for Sonoma.

The actions that appear in *italics* in Table 8-1 (in the **Action** column), are recommended by the CAC as priority actions for carbon sequestration.

Table 8-1: Potential carbon sequestration actions.

Title	Action	Summary
C-1. Increase Soil-Based Carbon Sequestration	Expand Application of Compost	Increase use of compost on public and private property.
	Explore Application of Biochar	Support the application of biochar.

Title	Action	Summary
C-2 Increase Planting of Trees	<i>Assess and Expand Urban Tree Shade Canopy</i>	Conduct an inventory and measurement of Sonoma’s existing shade tree canopy to assess its expansion.
	<i>Install Green Pocket Forests</i>	Plant dense pocket forests on public property.
	Seek Tree City USA Designation	Assess potential to achieve designation of Tree City USA.
C-3. Establish the Sonoma Carbon Offset Program	Establish a Local Carbon Offset Program for Sonoma	Create a local, voluntary carbon offset program for residents, businesses, and visitors.

8.3.1 Increase Soil-Based Carbon Sequestration

Expand Application of Compost - The city should expand the application of compost (and mulch) within the city limits through two options: (a) create an annual event to apply compost at appropriate city parks and public spaces and (b) through partnership with the Sonoma Garbage Collectors, Sonoma Ecology Center, and ZWS, create a quarterly free compost giveaway for Sonoma residents. The annual procurement of compost is mandated by state law SB 1383 and giveaway efforts count towards the city’s mandatory quota.

Support Application of Biochar - Biochar is the residual material (charcoal) composed of elemental carbon and ashes that remains after the pyrolysis of biomass in the absence of oxygen. It is best when it is produced from scheduled tree removal and trimmings using low carbon fuels for the pyrolysis phase. Biochar can be used as a soil amendment. Its use for carbon sequestration is an emerging technology. It is recommended that its application be supported through education and outreach.

8.3.2 Increase Planting of Trees

Conduct Urban Tree Shade Canopy Assessment - An urban tree canopy (shade) assessment measures a community’s tree canopy cover. Shade canopies increase natural cooling thereby reducing building energy consumption and decreasing solar gain on surfaces (e.g., sidewalks, driveways, and streets), which reduces the heat island effect. Neighborhoods with trees are typically 7 to 9°F cooler in summer months. Trees can reduce cooling costs up to 25% by shading buildings during warmer months. Expanding the tree canopy would also result in increased carbon sequestration.

Maintaining and expanding the city’s tree canopy is the city’s promulgated policy (SMC 12.08.010):

In addition, trees in the community and in the neighborhood provide a sense of identity and tradition and enhance property values. For all of these reasons, it is the goal of the city council to maintain and expand the extent of tree canopy in Sonoma.

Based on visual assessments, there is a tree shade canopy deficit in Sonoma especially on the west side, but this needs verification with data. Through grants, local communities, such as Petaluma (ReLeaf), have trained citizen scientists and students to conduct tree shade canopy assessments by mapping and identifying species and measuring the shade canopy for entry into a GIS database. Based on the inventory, shade canopy deficits are identified, which is followed by the restoration and expansion of the canopy through targeted plantings of appropriate trees.

In addition to public lands, the city should promote increased shade canopy in strategic areas that would also have strong co-benefits with cooling such as parking lots and private walkways.

Plant Miyawaki Forests - “Miyawaki Forests” are dense pocket forests that are grown with native trees and with minimal intervention. In addition to carbon sequestration, planting dense pocket forests creates islands of increased biodiversity. Miyawaki Forests could be planted on public property, such as city parks and preserves, but also private property that does not have trees.

Seek Tree City USA Designation - The city should seek a Tree City USA designation, which offers communities a four-step framework to maintain and grow their tree canopy. If received, the Tree City USA designation demonstrates to residents and the city’s commitment to healthy habitats and climate action through the planting and maintaining of trees that sequester carbon in addition to the multitude of co-benefits.

8.3.3 Establish the Sonoma Carbon Offset Program

Residents, businesses, and visitors can cancel out (offset) the impact of some of their GHG emissions by contributing to a local offset program. The city should create the Sonoma Carbon Offset Program, a voluntary carbon offset program that provides offsets specifically in Sonoma. Individuals and entities electing to offset some or all of their emissions would contribute a set dollar amount based on vehicle miles travelled or air miles traveled. All offset monies would go directly into the Sonoma City Tree Fund, which could be used to pay to plant and maintain trees in Sonoma (or Sonoma Valley) thereby supporting local carbon sequestration efforts. The city should partner with the Sonoma Valley Chamber of Commerce and the Sonoma Valley Visitors Bureau in promoting the fund through lodging and Special Events.

In the city, all trees on public property and existing significant trees on private property are protected from unnecessary damage, removal, or destruction. The protection of trees helps protect natural carbon sequestration under SMC 12.08.035.E. This ordinance also established the tree fund mechanism, but it is currently not operational nor funded. Thus, the first step is the adoption of an ordinance to reestablish and formalize the Tree Fund for the replacement of trees from development. In addition, the ordinance would add the carbon offset program component to

the fund and allow for voluntary contributions, similar to Petaluma’s ReLeaf program (www.releafpetaluma.org). The ordinance should also direct members of the city’s Tree Committee to focus their efforts on planting appropriate trees to sequester carbon and increase the tree canopy as previously discussed. Following the creation of the fund, the city could create a simple web-based platform that identifies vehicle and air miles’ GHG emissions and suggests contributions that would offset these miles. The platform would accept contributions that would be deposited into the Tree Fund.

8.4 Implementation of Carbon Sequestration Actions

This section outlines a potential strategy to implement each category of carbon sequestration-related actions. Regarding costs, the tables below present preliminary, estimated costs. Additional costs will be likely including initial start-up, ongoing administration, and compliance monitoring and enforcement costs. While some actions and supporting measures will only require funding from public entities, others will result in increased costs for businesses and residents.

The implementation timeframe presents a probable time to begin implementation of the action as either short-term (within 12 months), medium-term (12-24 months) and long-term (more than 24 months).

C-1 Increase Soil-based Carbons Sequestration					
Expand the application of compost in Sonoma and support the use of biochar.					
Target Year	Performance Metric			GHG Offset Potential	
2023	• Amount of compost distributed annually			• Medium	
Implementation Details					
Implementation Timeline	Medium-Term	Start Year	2023	Completion Year	20-23 and ongoing
Co-Benefits	<ul style="list-style-type: none"> Decrease water consumption. Improve soil health. 				
Basic Implementation Steps	<ol style="list-style-type: none"> Modify the city’s solid waste franchise agreement to provide free compost to the community on quarterly basis. Add a link on the city’s website providing educational materials on composting and biochar research. Support development of biochar demonstrations projects. 				
City Costs	• Staff time to modify the solid waste franchise agreement and the city’s website.				
Community Cost	Slight increase in trash fees to comply with state-mandated SB 1383 requirements.				
Funding Opportunities	CalRecycle’s SB 1383 grant				

C-2 Increase Planting of Trees					
Increase the planting of trees in strategic locations.					
Target Year	Performance Metric			GHG Offset Potential	
2023	<ul style="list-style-type: none"> Number of trees planted annually. Percent shade canopy in the city. Receipt of the Tree City USA designation. 			• Medium	
Implementation Details					
Implementation Timeline	Medium-Term	Start Year	2024	Completion Year	Continuing

C-2 Increase Planting of Trees	
Co-Benefits	<ul style="list-style-type: none"> • Decrease urban heat island effect. • Decreased cooling costs. • Increased and improved wildlife habitat.
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Identify a local non-profit to support the inventory of the current shade canopy. 2. Based on the assessment, develop a tree planting plan (GIS-based) with the goal of achieving Tree City USA designation. 3. Identify opportunity sites for green pocket forests.
City Cost	<ul style="list-style-type: none"> • Staff time to identify partners. • \$10,000 to support non-profit recruitment of volunteers and equipment. • Cost to plant new trees (may be covered by revised Tree Fund). • Staff time to prepare ordinance to establish and expand the Sonoma City Tree Fund. • Staff time to prepare application for Tree City USA designation.
Community Cost	None known at this time.
Funding Opportunities	USDA Urban & Community Forestry CalFire Urban and Community Forests

C-3 Create Local Carbon Offset Program					
Initiate the City of Sonoma Carbon Offset Program.					
Target Year	Performance Metric				GHG Offset Potential
2023	<ul style="list-style-type: none"> • Number of participants per year. • Amount of money collected per year. • Number of trees planted and protected. 				<ul style="list-style-type: none"> • Medium
Implementation Details					
Implementation Timeline	Medium-Term	Start Year	2023	Completion Year	Continuing
Co-Benefits	<ul style="list-style-type: none"> • Decrease urban heat island effect. • Decreased cooling costs. • Increased and improved wildlife habitat. • Promotes environmentally conscious tourism. 				
Basic Implementation Steps	<ol style="list-style-type: none"> 1. Create an ordinance to reinvigorate and modify the Tree Fund. 2. Create a Sonoma-specific carbon offset program and a web-based payment platform. 3. Recruit partners to participate in promoting the program and participants. 4. Start the program. 				
City Cost	<ul style="list-style-type: none"> • Staff time to modify the Tree Fund. • Staff time to create the offset program and a web-based platform. • Potential costs for the web-based payment program. • Staff time to recruit partners to participate in promoting the program. 				
Community Cost	None known at this time.				
Funding Opportunities	USDA Urban & Community Forestry CalFire Urban and Community Forests				

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Appendix I. Climate Emergency Resolution

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RESOLUTION # ~~59~~ - 2020

RESOLUTION ENDORSING THE DECLARATION OF A CLIMATE EMERGENCY AND IMMEDIATE ACTIONS TO RESTORE A SAFE CLIMATE:

WHEREAS in October 2018 the Intergovernmental Panel on Climate Change (IPCC), the largest collaborative, consensus-based effort among the world's scientific community, released a *Special Report on Global Warming of 1.5°C*¹ stating that "human activities are estimated to have (already) caused approximately 1°C of global warming above pre-industrial levels;

WHEREAS an increase in global average surface temperature is already resulting in numerous secondary effects² including: rising sea levels; decreased snowpack; accelerated melting of ice sheets in Greenland and Antarctica; accelerated melting of Arctic permafrost; increased incidence and intensity of extreme weather events such as heat waves, droughts, hurricanes, and tornadoes; increasing incidence and intensity of wildfires; spread of diseases; and more;

WHEREAS the *IPCC's Special Report on Global Warming of 1.5° C* states that in order to have a likely chance of limiting global warming to 1.5° C, our remaining "carbon budget" is equal to only 10 years of current greenhouse gas emissions;

WHEREAS restoring a safe and stable climate requires a climate mobilization at all levels of government and society on a scale, scope and speed not seen since World War II;

WHEREAS the **current pace and scale** of national, state and local action is far less than adequate to avert substantial damage to our economy, environment and human health over the coming decades;

WHEREAS **wildfires** in Northern California in 2017, 2018, and 2019 destroyed over 38,000 structures, killed 118, displaced thousands, and caused serious declines in our area's air quality;

WHEREAS the current pace of sea level rise is already impacting California's coastlines, with the possibility of 6 feet or more of total sea level rise by 2100;

WHEREAS climate change and the global economy's overshoot of sustainable ecological limits are driving the sixth mass extinction of species;

WHEREAS all the nations of the world have signed the 2015 Paris Agreement,³ vowing to keep warming this century well below 2°C above pre-industrial levels" and to "pursue efforts to limit the temperature increase even further to no more than 1.5°C;"

WHEREAS the IPCC's warnings are echoed by both *California's Fourth Climate Change Assessment*⁴ report released in August 2018 and the Fourth National Climate Assessment⁵ report issued in November 2018, which underscored the need for immediate climate emergency action at all levels of government;

WHEREAS on September 12, 2018, Governor Jerry Brown signed "*Executive Order B-55-18 to Achieve Carbon Neutrality*"⁶ committing California to economy-wide "carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter";

WHEREAS on November 5, 2019, more than 11,000 researchers from around the world issued a grim warning of the "untold suffering" that will be caused by climate change if humanity doesn't rapidly change its ways;⁷

¹ IPCC Special Report 2018 (www.ipcc.ch/sr15/).

² www.nrdc.org/stories/are-effects-global-warming-really-bad

³ 2015 Paris Agreement (www.unfccc.int/sites/default/files/english_paris_agreement.pdf) or <https://unfccc.int/resource/docs/2015/cop21/eng/109r01.pdf>

⁴ www.climateassessment.ca.gov

⁵ www.nca2018.globalchange.gov

⁶ www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-ExecutiveOrder.pdf

⁷ www.cnn.com/2019/11/05/world/climate-emergency-scientists

WHEREAS the United States has contributed greatly to these climate and ecological crises and bears an extraordinary responsibility to help solve them;

WHEREAS **marginalized communities** worldwide — including people of color, indigenous communities, low-income people, those with disabilities, and the homeless — are already disproportionately affected by climate change;

WHEREAS a just transition to a safe climate must encourage the active participation and protection of marginalized communities and work to ensure that they benefit first from a sustainable and equitable economy;

WHEREAS it is **inexcusable to do too little, too late** — knowingly subjecting our fellow humans now and in the future to societal breakdown, shortages of food and clean water, economic collapse, vast refugee movements, and life on an increasingly uninhabitable planet;

WHEREAS the City of Sonoma has often seen itself as a leader in addressing environmental issues including human-caused climate change, having made bold commitments in its Resolution 44-2005 establishing GHG emissions reduction targets for the City by 2015 and later in its participation in the greenhouse gas reduction efforts set forth in the Regional Climate Protection Authority's (RCPA) *Climate Action 2020 Plan*; and

WHEREAS the City of Sonoma needs to do everything in its power to convert at emergency speed to a truly sustainable community — economically, socially and ecologically — and participate effectively in a regional just transition through climate mobilization efforts;

NOW, THEREFORE, BE IT RESOLVED that the City of Sonoma declares that a climate emergency threatens our city, our Sonoma Valley, our region, our state, and all life on Earth;

BE IT FURTHER RESOLVED that the City of Sonoma commits to a city-wide climate emergency mobilization in alignment with current and evolving climate science that includes: (1) mitigation: reduce city-wide greenhouse gas emissions to net zero no later than 2030; (2) drawdown/sequestration: supporting effective carbon negative actions to place carbon underground where it will remain for virtual perpetuity plus supporting similar steps that remove carbon from the atmosphere; and (3) adaptation/resilience: implementing and/or supporting measures to prepare for the inevitable consequences and impacts of a rapidly warming planet; and

BE IT FURTHER RESOLVED that the City of Sonoma will begin an evaluation of all existing and emerging policies, plans, projects, purchases, and priorities in accordance with our critical goals of mitigation, drawdown, and adaptation; and

BE IT FURTHER RESOLVED that the City of Sonoma will work in partnership with the RCPA to immediately make a comprehensive update to the latest data on citywide GHG emissions — including those associated with residents' consumption of goods and services — and to request RCPA to thereafter track our city's GHG emissions and publicly report annually on our progress towards the goal of net zero emissions; and

BE IT FURTHER RESOLVED that the City of Sonoma will, during the update of its General Plan, evaluate and include the goals of net zero emissions by 2030 (mitigation), carbon negative action (drawdown), and management of climate-affected impacts (adaptation); and

BE IT FURTHER RESOLVED that the City of Sonoma commits to ongoing education and active engagement of all city staff, members of boards and commissions, local non-profit organizations, contractors, consultants, residents, and independent community groups in alignment with the adopted emergency goals of mitigation, drawdown, and adaptation; and

BE IT FURTHER RESOLVED that the City Council has established an ad hoc subcommittee tasked with creating a standing Joint Climate Action Subcommittee with two members of the City Council and two members of the Community Services and Environment Commission (CSEC) tasked with determining best courses of action to pursue implementation of the climate emergency mobilization; and

BE IT FURTHER RESOLVED that the City of Sonoma will ensure that its Sustainability Coordinator will be responsible for overseeing city climate-related efforts and have the authority to form teams as needed to address the climate emergency successfully. Under the direction of the City Council, City Manager, and City Planning Director, in meeting these responsibilities, the Sustainability Coordinator shall work closely with the city's Community Services and Environment Commission (CSEC); and

BE IT FURTHER RESOLVED that the City of Sonoma acknowledges that full public participation of its residents is essential to the success of this effort; and

BE IT FURTHER RESOLVED that the City of Sonoma commits to contributing to RCPA's development of a countywide 2030 Climate Emergency Mobilization Strategy focused on identifying key local actions — including RCPA's 10-year Emergency Policy Directive setting out priorities for the most-effective local policies and programs that will drive systems change and identify the key areas for state-level advocacy; and

BE IT FURTHER RESOLVED that the City of Sonoma will support the RCPA coalition of local governments mobilizing for effective and rapid regional climate action; and

BE IT FURTHER RESOLVED that the City of Sonoma, to set a clear example for the community, commits to reduce the carbon footprint of its municipal operations to net zero no later than 2030; and

BE IT FURTHER RESOLVED that the City of Sonoma joins a nationwide call for a broader just transition and emergency mobilization at all levels of government to restore a safe climate, and will partner with local, regional and state agencies to implement immediate actions — including implementation of the climate actions adopted by the city in 2016⁸ and the Climate Action and Environmental Sustainability 2020-2021 Work Plan.

APPROVED FOR IMPLEMENTATION BY:

City of Sonoma Community Services and Environment Commission: 11 December 2019

City of Sonoma City Council: November 2, 2020

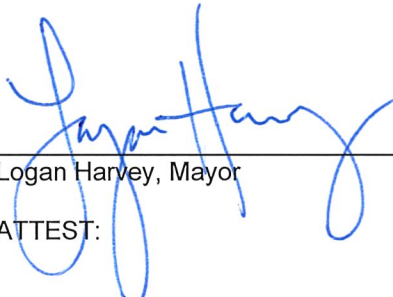
PASSED, APPROVED, AND ADOPTED by the City Council of the City of Sonoma at its regular meeting held on November 2, 2020 by the following vote:

AYES: **AGRIMONTI, HARRINGTON, HUNDLEY, HARVEY**

NOES:

ABSENT: **COOK**

ABSTAIN:



Logan Harvey, Mayor

ATTEST:

Rebekah Barr, MMC, City Clerk

⁸ City of Sonoma Resolution 40-2016 (adopted 11/21/2016).

Appendix II. Sonoma's Climate Actions and Data as of April 2020

The various accomplishments and associated data are presented in the following major GHG categories:

- Buildings
- Water Resources
- Transportation
- Waste Reduction
- Miscellaneous

Under each of the five categories, information is presented in tables that list the climate/sustainability action, provides a very brief description of the item, and presents available results and data.

I-A. Buildings

The following table presents a list of energy items, their description, and available results and data as of April 2020.

Energy Item	Description	Results/Data
Renewable Power	In July 2013, Sonoma joined the Sonoma Clean Power (SCP) consortium, a Community Choice Aggregation program. The default choice for customers is CleanStart; customers can opt-out to purchase the PG&E option.	Sonoma (zip code 95476) has 5,530 electrical power meters: 4,578 (82.8%) Residential and 949 (17.2%) Commercial & Industrial Meters. Of total eligible meters, 86.9% use SCP (CleanStart and Evergreen) while only 13.1% have opted out. Sonoma is 8th among the 13 jurisdictions in SCPs service area with opt-outs. ²⁹
Low Carbon Energy	CleanStart is 91% carbon free (renewable and hydro) producing 98.81 lbs. CO ₂ /MWh whereas the PG&E option is 69% carbon free (33% renewable, 24% nuclear, 12% large hydro). ³⁰	The vast majority of the 86.9% customers not opting out of SCP subscribe to the CleanStart option.

²⁹ Personal communication, Nathan Kinsey. Commercial Accounts Manager, Sonoma Clean Power, January 31, 2020.

³⁰ <https://sonomacleanpower.org/uploads/documents/Power-Content-Label-2018-Web.pdf>

Energy Item	Description	Results/Data
Local, Low Carbon Energy	The EverGreen option is 100% local renewable power (geothermal and solar) producing 46.02 lbs. CO ₂ /MWh ³¹	City operations switched to the EverGreen program—the first jurisdiction in the county to do so. A total of 80 (1.4%) meters in zip code 95476 have signed up for the EverGreen option. Sonoma ranks 3rd out of 13 jurisdictions in the county for its total percentage of EverGreen accounts/meters. ³²
Street Lighting Efficiency	Replace inefficient streetlights with high efficiency LED lights.	In 2015, the city replaced 1,100 streetlights with energy efficient LED fixtures reducing annual CO ₂ emissions by 180,000 lbs.
Traffic Light Efficiency	Replace traffic (safety) lights with high efficiency LED lights.	In 2012, CalTrans converted 25 traffic/safety lights (100%) at 9 intersections in the City. Each LED conversion saves up to 615 kWh of energy. Conversion to the 25 LEDs results in an approximate annual GHG reduction of 11,600 lbs of CO ₂ . Each LED is designed to last up to 15 years compared to a 5-year life span of earlier generation lighting. ³³
Residential Solar PV Installations	Installation of roof-top photovoltaic (PV) solar arrays on residential buildings.	Between 2002 and 2019, 1,364 residential accounts in zip code 95476 installed PV solar units with 8,466.75 kW DC installed capacity; an average of 6.2 kW DC per installation. ³⁴ In the City limits, the estimated PV installation rate for homes is a minimum of 14% ³⁵
Commercial Solar PV Installations	Installation of roof-top PV solar arrays on commercial buildings.	Between 2002 and 2019, 83 commercial accounts in zip code 95476 installed PV solar units with 4,067.33 kW DC installed capacity; at an average of 49 kW DC per installation. ³⁶
Industrial Solar PV Installations	Installation of roof-top PV solar arrays on industrial buildings.	Between 2011 and 2012, 2 industrial accounts in zip code 95476 installed PV solar units with 1,108.45 kW DC installed capacity. ³⁷
Non-profit Solar PV Installations	Installation of roof-top PV solar arrays on non-profit buildings.	Between 2016 and 2017, 3 non-profit accounts in zip code 95476 installed PV solar units with 92.94 kW DC installed capacity. ³⁸
City Government Solar PV Installations	Installation of PV solar arrays on city government buildings.	A PV solar array was installed on the Police Facility in 2010 with an output of 52.4 kW. A PV array was installed on the Public Works Building at the Corporation Yard in 2011 with an output of 20.2 kW.
Expedited Solar PV Permitting	Sonoma's Building Department offers expedited PV solar permitting (1 to 3 days) for single- and dual unit residential buildings.	The city implemented the expedited PV solar permitting program in 2015. Between 2015 and February 2020, 215 permits were issued for PV solar installations.

³¹ <https://sonomacleanpower.org/uploads/documents/Power-Content-Label-2018-Web.pdf>

³² Personal communication, Nathan Kinsey. Commercial Accounts Manager, Sonoma Clean Power, January 31, 2020.

³³ Personal communication, Phillip Rodriguez, District 4 Sustainability Manager, California Department of Transportation, January 31, 2020.

³⁴ Go Solar California--California Energy Commission & California Public Utilities Commission, 2020

³⁵ There are 1,714 parcels in the City of Sonoma with single family residences or duplexes. Since 2015, 242 building permits have been issued for residential PV solar systems. Building permits for PV units were issued prior to 2015 but exist in paper form and thus have not yet been tracked.

³⁶ Go Solar California--California Energy Commission & California Public Utilities Commission, 2020

³⁷ Go Solar California--California Energy Commission & California Public Utilities Commission, 2020

³⁸ Go Solar California--California Energy Commission & California Public Utilities Commission, 2020

Energy Item	Description	Results/Data
Solar PV Requirements for New Construction	Starting in 2020, updated state building efficiency standards require all new low-rise single-family and multifamily buildings to install a rooftop PV solar system or to use an offsite community solar system.	City adopted the state solar mandate code.
Expedited Battery Storage Systems	Sonoma's Building Department offers expedited permitting (2 to 4 days) for Battery Energy Storage Systems.	City implemented the expedited battery storage permitting program in 2019. In 2017 and 2018, 3 permits were issued for battery storage installations.
Solar on Multifamily Affordable Housing	Solar on Multifamily Affordable Housing (SOMAH) program provides financial incentives for installing solar PV energy systems on multifamily affordable housing.	Under the Solar on Multifamily Affordable Housing (SOMAH) program, between 2012 -2016, 14 rooftop solar PV projects were completed in zip code 95476 saving 6,790 therms of natural gas annually. ³⁹
New Solar Homes Partnership	The New Solar Homes Partnership program provides incentives for new solar homes.	Under the New Solar Homes Partnership program, between 2014 -2018, 8 solar projects with 105.23 kW capacity were completed in zip code 95476. ⁴⁰
Solar Consultations	The Sonoma County General Services, Energy and Sustainability Division, provides free, unbiased consultations on PV Solar potential for residential structures.	Between June 2019 and January 2020, six Solar PV consultations were completed for individuals in zip code 95476. ⁴¹
Sonoma County Energy Independence Program	The Sonoma County Energy Independence Program (SCEIP) offers Property Assessed Clean Energy (PACE) financing for energy and water efficient improvements through the property tax system for residential, commercial, industrial, agricultural, multifamily and certain non-profit projects.	Between 2009 and 2019, SCEIP financed 38 projects and 87 improvements in Sonoma funded at a value of \$1.11 million. ⁴²
Home Energy and Water Workshops	The Sonoma County General Services, Energy and Sustainability Division, provides free workshops onsite and in communities to reduce energy and water consumption for residential structures.	Between 2017 and 2019, two workshops were held in Sonoma. ⁴³

³⁹Go Solar California--California Energy Commission & California Public Utilities Commission: <https://www.californiadgstats.ca.gov/downloads/>

⁴⁰ Go Solar California--California Energy Commission & California Public Utilities Commission, 2020

⁴¹ Personal communication, B.C. Capps, Energy and Sustainability Analyst, Energy and Sustainability Division, Sonoma County General Services Department, January 31, 2020.

⁴² Personal communication, B.C. Capps, Energy and Sustainability Analyst, Energy and Sustainability Division, Sonoma County General Services Department, January 31, 2020.

⁴³ Personal communication, B.C. Capps, Energy and Sustainability Analyst, Energy and Sustainability Division, Sonoma County General Services Department, January 31, 2020.

Energy Item	Description	Results/Data
<p>DIY Energy Audit Kits</p>	<p>Do it yourself energy audit kits are provided that includes weather stripping, kill-o-watt meter, IR thermometers, and other tools and equipment to reduce energy loss.</p>	<p>A DIY Energy Audit Kit is available for checkout at the Sonoma County Regional Library in Sonoma.</p>

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I-B. Water Resources

The following table presents a list of water resource items, their description, and available results and data as of April 2020.

Water Resources Item	Description	Results/Data
Advanced Metering Infrastructure	Advanced Metering Infrastructure (AMI) uses new generation meters that provide remote, real-time access to water usage allowing customers to monitor water usage before seeing the water bill. In addition, notification alarms can be set to identify usage spikes or possible leaks and provide for early leak detection for quicker repairs.	All water meters in Sonoma are scheduled to be replaced with new AMI meters, which should reduce per capita water consumption by 9-15%.
Leak Letters	When a continuous flow is detected in a household, Sonoma Water sends a "leak letter" to the building owner. This letter is often followed up with education and outreach to identify the leak and recommend water conservation actions/items.	Between July 2016 and January 2020, 6,755 leak letters were sent.
Turf Removal Rebate Program	Cash rebates are provided for the removal of turf thereby reducing the need for irrigation	Since 2014, 125,589 square feet of turf has been removed under this program.
Water Conservation Devices	The City provides customers with free low-flow shower heads, faucet aerators, and automatic hose shutoffs.	Annually, between 2009 and 2019, the City has provided, free of charge, approximately 500 of each of the three water conservation devices. In addition, a container with all these devices is located in the front entrance of City Hall for individuals to take free of charge.
Low Flow and Automatic Shut-Off Faucets	Devices designed to conserve water.	The Sonoma Plaza public restrooms have low-flow faucets; restrooms in the Police Department/City Council Chambers also have automatic shut-off faucets.
High-Efficiency Water Rebate Program	The Sonoma-Marin Saving Water Partnership provides rebates for the purchase of high-efficiency residential washing machines and commercial dishwashers, ice machines, lavatory faucets, pre-rinse spray valves, and steam cookers	Since June 2014, 52 washing machine rebates were processed for Sonoma residents.
Water-Efficient Landscaping	New construction projects with landscape areas of 500 ft ² and rehabilitated construction projects with landscape areas of 2,500 ft ² requiring city building permits must assess and plan for water-efficient landscaping.	Sonoma adopted the enhanced requirements for water-efficient landscaping in 2017.
Recycled Water Use at Sonoma Valley High School	Recycled water for irrigation of athletic fields to off-set consumption of potable water.	Starting in 2020, SVHS will replace 50-acre ft of potable water with recycled water for irrigation of athletic fields. ⁴⁴

⁴⁴ Personal communication, Kevin Booker, P.E., WA Principal Engineer, Sonoma Water, February 11, 2020.

Water Resources Item	Description	Results/Data
Low Impact Design Landscaping Demonstration	Demonstration of low impact water design features including rainwater harvesting, drought resistant plantings, porous surfaces.	A low-impact demonstration garden is located at the Sonoma Garden Park.

I-C. Transportation

The following table presents a list of transportation items, their description, and available results and data as of April 2020.

Transportation Item	Description	Results/Data
Alternative Motor Vehicles	As of October 2018, there were 30,720 vehicles (cars, light trucks, SUVs, and heavy trucks) registered in zip code 95476 ⁴⁵ .	Vehicles not exclusively gasoline fueled as of October 2018 in zip code 95476 ⁴⁶ : <ul style="list-style-type: none"> - Diesel/Diesel Hybrid = 1,708 (5.56%) - Hybrid = 1,498 (4.88%) - Plug-in Hybrid = 306 (1.0%) - Electric (EV) = 289 (0.94%) - Natural Gas = 7 (0.02%) - Hydrogen Fuel Cell = 5 (0.02%)
Public Transit	City-subsidized "Fare-Free" Sonoma Shuttle rides (Route 32).	In 2019, the first year of the program, there was a 55.39% (16,763 rides) increase in ridership. <ul style="list-style-type: none"> Youth = +142.4% Adult = +65.4% Senior = +46.7% Child = +25.1% Disabled = -15.6% Transfers = -99.6% Among the five fare-free routes in the county, Sonoma had the 2nd highest ridership increase. ⁴⁷
Electrical Vehicle Charging Stations	Stations designed to charge electric vehicles (EVs).	There are 4 stations in Sonoma: 3 private stations connected to lodging and 1 station in the City public parking lot at 152 East Napa Street.
EV Charger Permitting	Sonoma's Building Department offers expedited permitting (1 to 3 days) for EV Charging Stations.	City adopted this program in 2017.
Electrical Vehicle Charging Capability	In 2010, Green (CA Green Building Code) required EV charging infrastructure requirements (conduit and circuit sizing) for new construction.	City adopted the code in 2010.
Pedestrian Network	Features to improve movement by pedestrians.	Sonoma has created 30 marked crosswalks. ⁴⁸

⁴⁵California Department of Motor Vehicles, https://www.dmv.ca.gov/portal/dmv/detail/pubs/media_center/statistics

⁴⁶California Department of Motor Vehicles, https://www.dmv.ca.gov/portal/dmv/detail/pubs/media_center/statistics

⁴⁷ Personal communication, Bryan Albee, Transit Systems Manager, Sonoma County Transit, January 13, 2020.

⁴⁸ Sonoma Bicycle & Pedestrian Master Plan (2008, updated 2014). pg. 25.

Transportation Item	Description	Results/Data
Enhanced Pedestrian Safety and Accessibility	Improve the safety and accessibility for pedestrians.	CalTrans has multiple pedestrian safety enhancements planned for the City to be completed in 2022 including: <ul style="list-style-type: none"> – Install pedestrian crosswalk signs – Restripe pedestrian crossings with high visibility crosswalk markings – Pedestrian-activated crosswalk lights – Upgrade ADA curb ramps.⁴⁹
Bicycling Opportunities	Dedicated bike paths, bike lanes, and mapped bike routes.	Sonoma has created: <ul style="list-style-type: none"> – Class I pathway, 3.91 miles – Class II bike lanes, 1.99 miles – Class III bike routes, 2.41 miles⁵⁰
Bicycle Parking	Designated parking to support bicycling infrastructure.	There are 70 spaces available for bicycle parking at 55 locations on public and private property including 49 bike racks, 4 bollards, 1 post, and 1 cement slot. ⁵¹
Bicycle Rentals	Bicycle rental opportunities in Sonoma	There are 3 companies in Sonoma that rent bicycles in addition to area lodgings that offer or rent bicycles for guests.
Enhanced Bicycle Safety and Accessibility Enhancements	Improve the safety and accessibility of bicycle transportation in the City.	CalTrans has plans to accommodate additional Class II Bikeways in limited portions of SR-12 (Broadway Street) through a repaving project by 2022. ⁵²
Safe Routes to School	Sonoma County Bicycle Coalition offers bicycle safety education and bicycling skill/safety practice to promote bicycling to school.	Adele Harrison Middle School, Prestwood Elementary School, and St. Francis Solano School are enrolled in the Safe Routes to School program.
Anti-Idling Ordinance	Limitations on commercial vehicle idling	SMC 9.56.080 limits idling of commercial vehicles when parked within 100 feet of residential zoning district to 5 consecutive minutes of idling except when vehicles are loading/unloading in which idling is limited to 30 minutes.

I-C. Waste Minimization

The following table presents a list of waste minimization items, their description, and available results and data as of April 2020.

Waste Minimization Item	Description	Results/Data
Free Residential Curbside Recycling	Not charging for recycling collection to reduce the disposal of trash.	Sonoma Garbage offers free curbside recycling collection.
Free Residential Curbside Green & Vegetative Waste Collection	Not charging for green waste collection to increase the recovery of organics while reducing the disposal of trash.	Sonoma Garbage offers free curbside green and vegetative waste collection.

⁴⁹ Personal communication, Phillip Rodriguez, District 4 Sustainability Manager, California Department of Transportation, January 31, 2020.

⁵⁰ Sonoma Bicycle & Pedestrian Master Plan (2008, updated 2014).

⁵¹ Sonoma Bicycle & Pedestrian Master Plan (2008, updated 2014).

⁵² Personal communication, Phillip Rodriguez, District 4 Sustainability Manager, California Department of Transportation, January 31, 2020.

Waste Minimization Item	Description	Results/Data
Tier-based Pricing for Residential Curbside Trash Collection	Using economic incentives to reduce the generation and disposal of trash.	Sonoma Garbage offers 3 different sized trash containers and fees, which is an economic nudge to reduce trash generation.
Free Commercial Food Waste Collection	Not charging for commercial food waste collection to increase recovery of food waste and thereby reducing disposal of trash.	Sonoma Garbage offers its commercial customers free food waste collection
Food Recovery	Recovering edible food from grocery stores that would otherwise go to the landfill and instead distributed through local emergency food programs	The non-profit organization Friends in Sonoma Helping (F.I.S.H.) and Redwood Empire Foodbank collect and distributes tons of food each month from Whole Foods, Safeway, and the Sonoma Market.
Composting Workshops	Zero Waste Sonoma and UC Master Gardener Program of Sonoma County hold free home composting workshops	In 2018 and 2019, 4 workshops were held: 2 in English (28 participants) and 2 in Spanish (14 participants).
Free Mulch and Compost Program	Local mulch provided to residents.	Sonoma Garbage offers customers free mulch of up to 1 yd
Christmas Tree Recycling	Sonoma Girl Scouts offers curbside collection of Christmas Trees for composting with a suggested donation	Christmas Trees collected and composted from Sonoma Valley: 2013-2014 = 1,429 2014-2015 = 1,274 2015-2016 = 1,368 2016-2017 = 1,316 2017-2018 = 1,103 2018-2019 = 1,130
Ban on Single-Use Plastics at City Events	Reducing the generation of disposable plastics to encourage the use of environmentally preferable alternatives.	Starting in 2019, single-use plastics and compostable plastics are banned at permitted events held on the Plaza and Deport Park. This model has been adopted by Windsor and Sebastopol and is being considered by Cloverdale
Public Space Trash and Recycling	Improved design of public space trash and recycling can increase recycling while decreasing the generation and disposal of trash. Improvements include improved signage, weather protection, and trash/recyclables segregation.	In 2020, 27 new public space trash stations with 81 new containers are proposed to be installed on the Sonoma Plaza.
Water Bottle Filling Stations	Water bottle filling stations for reusable containers decrease the generation and disposal of single-use plastics.	Sonoma Plaza = 1 station, 2 more are planned for installation in 2020 Sonoma Valley High School = 3 stations
Construction & Demolition Waste Management	Building contractors must provide a construction waste management plan for City inspectors to review and approve, which includes invoices and other documentation to demonstrate the diversion rate of 65% was met.	This requirement is a component of CALGreen, which has been adopted by the City.

Waste Minimization Item	Description	Results/Data
Electronic Waste Collection Events	Periodically, Zero Waste Sonoma offers free electronics collection events to increase recovery and reduce disposal.	Between March 2017 and November 2019, 5 electronic collection events were held in Sonoma with 952 participants, 60,199 lbs were collected. ⁵³
Electronic Waste Drop off	Free electronic waste drop-off at Staples on W. Napa Street and the Sonoma Transfer Station	Between 2017 and 2019, 803,805 lbs of electronic waste was dropped off at the Sonoma Transfer Station. ⁵⁴
Mattress Collection Events	Periodically, Zero Waste Sonoma offers free mattresses collection events to increase their recovery and thus reduce their disposal.	In 2017, 24 mattresses were collected and in 2019, 44 mattresses were collected. ⁵⁵
Used Ink Cartridge Drop-off	Free used ink cartridge drop-off at Staples	Collection point at Staples, W. Napa Street.
Used Rechargeable Battery Drop-off	Free used rechargeable battery waste drop-off	Collection points at Friedman's and Staples, W. Napa Street
Household Hazardous Waste Collection Events	Periodically, Zero Waste Sonoma offers free household hazardous waste collection events	Between January 2017 and November 2019, 655 participants dropped off 46,901 lbs of household hazardous waste at collection events in Sonoma. ⁵⁶
Curbside Used Oil Collection	Sonoma Garbage Collectors conducts free, curbside collection of used oil	Between 2017 and 2019, 245 gallons (1,838 lbs) of used oil was collected. ⁵⁷
Cork Recycling	Free collection for natural corks	Collection point located at Whole Foods in Sonoma
Reuse Shops	Retail and non-profit shops that focus on reuse--reselling used goods—reduce the amount of waste generated and disposed.	There are 3 thrift stores and 1 consignment shop in Sonoma
Curbside Collection for Reusable Clothes and Goods	Non-profit and for-profit services conduct periodic curbside collections of reusable goods, electronic waste, and bulky waste	Redwood Gospel Mission of Santa Rosa and United Cerebral Palsy conduct periodic curbside collections.
Textile Recovery: Reusable Clothes and Household Goods	Non-profit organization that maintains donation boxes at host sites where reusable goods, clothes, and small household items in working order.	Recycle for Change has 4 locations in Sonoma: <ul style="list-style-type: none"> – 19425 Sonoma Hwy – 195 W. Napa St – 925 Broadway – 20580 Broadway
Drug/Pharmaceutical Drop off	Collection of unwanted and expired drugs/pharmaceuticals and vaping cartridges for safe and proper disposal.	The pharmaceutical/drug drop off is located inside the Sonoma Police Department.

⁵³ Personal communication, Courtney Scott, Household Hazardous Waste Program Manager, Zero Waste Sonoma, January 27, 2020.

⁵⁴ Personal communication, Courtney Scott, Household Hazardous Waste Program Manager, Zero Waste Sonoma, January 27, 2020.

⁵⁵ Personal communication, Sloane Pagel, Zero Waste Program Manager, Zero Waste Sonoma, April 13, 2020.

⁵⁶ Personal communication, Courtney Scott, Household Hazardous Waste Program Manager, Zero Waste Sonoma, January 27, 2020.

⁵⁷ Personal communication, Courtney Scott, Household Hazardous Waste Program Manager, Zero Waste Sonoma, January 27, 2020.

Waste Minimization Item	Description	Results/Data
Electric Hand Dryers	Electric hand dryers eliminate the generation of paper towel waste.	Electric hand dryers were installed at the Plaza public restroom.
Paint Take back	Unwanted, leftover paint is accepted for recovery and recycling operated by the Paint Stewardship Council.	There currently is no paint collection site in the City limits, but Kelly-Moore at 18506 CA-12 in the Springs has collected paint since 2012: 2013-14 = 37,523 lbs 2014-15 = 40,331 lbs 2015-16 = 53,113 lbs 2016-17 = 60,305 lbs 2017-18 = 58,875 lbs 2018-19 = 67,934 lbs 2019-Date = 33,495 lbs Total = 351,576 lbs ⁵⁸
Online Business License Renewal	Paperless applications for City businesses licenses reduce the generation of paper waste.	In 2020, Sonoma adopted an online paperless application program for its current 2,328 licensees to replace the single page, doubled-sided paper application.

I-D. Miscellaneous

The following table presents a list of miscellaneous items, their description, and available results and data as of April 2020.

Miscellaneous Item	Description	Results/Data
Parks and Conserved Open Space	Open and conserved space is critical for healthy natural habitat and for recreation.	Sonoma has 16 parks encompassing 79.15 acres and 2 open space preserves encompassing 98.75 acres. ⁵⁹
Farmer's Markets	Fresh local food sales	Sonoma has two seasonal (Sonoma Garden Park and the Plaza) and one year-round (Depot Park) weekly farmer's markets with a total of approximately 100 farmer market days per year (there is also a seasonal weekly market in the Springs).
Tree Protection Ordinance	All trees on public property and existing significant trees on private property are protected from unnecessary damage, removal, or destruction	This ordinance is codified in SMC Chapter 12.08
Green Purchasing Policy	State guidelines exist on the purchase of recycled products - State of California Public Contract Code	In 2011, the City approved a green purchasing policy by adopting the state guidelines codified in SMC Chapter 3.04.060.
Community Gardens	Community gardens are collectively gardened plots on public land to produce local fruit, vegetables, and/or plants.	Sonoma has approximately 35 community garden plots available at Sonoma Garden Park.

⁵⁸ Personal communication, Daria Kent, Northern California Regional Coordinator, Paint Care, February 12, 2020.

⁵⁹ Sonoma Bicycle & Pedestrian Master Plan (2008, updated 2014). pg. 25.

Miscellaneous Item	Description	Results/Data
Sustainability Coordinator	Position supporting the implementation of climate actions, waste minimization, and EV charging stations	Sonoma's part-time Sustainability Coordinator was hired in December 2019.
Sustainability-based Education	Sustainability-based education programs are organized and conducted by the Sonoma Ecology Center at the Sonoma Garden Park.	Programs offered: <ul style="list-style-type: none"> – Sustainable gardening demonstrations and workshops – EnviroLeader Internship Program in sustainable agriculture and habitat restoration – K-12 watershed education – Summer Science Camps – Field trips including every 4th grader in Sonoma
Certified Green Businesses	The Sonoma County General Services, Energy and Sustainability Division, provides assistance to small to medium sized businesses to become a Sonoma County Green Business Certified company	Sonoma currently has 4 certified green businesses and 5 pending applications for certification. ⁶⁰
Wood Burning Devices Ban	Wood-burning appliances release CO ₂ and can degrade air quality.	City adopted a ban on certain wood burning devices in 2005.
Gasoline-Powered Leaf Blower Ban	Gasoline-powered leaf blowers produce comparatively high levels of emissions that can degrade air quality while also contributing to noise pollution.	In 2016 the use of gasoline-powered leaf blowers was banned.
Pesticide Use Restriction	Restricting or banning the use and application of problematic pesticides can improve ecological habitat and non-targeted species.	In May 2019, the City approved a ban on the application of glyphosate-based herbicides on City property

⁶⁰ Personal communication, B.C. Capps, Energy and Sustainability Analyst, Energy and Sustainability Division, Sonoma County General Services Department, January 31, 2020.