City of Elk Grove

Climate Compass

A Plan for Implementing Elk Grove's Climate, Sustainability, and Resilience Goals

May 2026

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2022 Scoping Plan	2022 Scoping Plan for Achieving Carbon Neutrality
AB	Assembly Bill
ADU	Accessory Dwelling Unit
BAU	business-as-usual
BE	Buildings and Energy
BEMS	building energy management system
BERC	Business Environmental Resource Center
BF	Buildings and Facilities
BIA	North State Building Industry Association
CA	Climate Action Commitment
CALGreen	California Green Building Standards
CalOES	California Governor's Office of Emergency Services
CAP	Climate Action Plan
CARB	California Air Resources Board
CBO	community-based organization
CCSD	Cosumnes Community Services District
CCSD FD	Cosumnes Community Services District Fire Department
CCSD PR	Cosumnes Community Services District Parks and Recreation Department
CD	Elk Grove Community Development Department
CEQA	California Environmental Quality Act
CH_4	methane
CIS	Civic Innovation and Sustainability
CM	Elk Grove City Manager's Office
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COEG	City of Elk Grove government
DC	direct current
e-bike	electric bike
EGCG	Elk Grove Community Garden and Learning Center
EGUSD	Elk Grove Unified School District
EGWD	Elk Grove Water District

EV	electric vehicle
FEC	Fleet and Employee Commute
FI	Elk Grove Finance Department
FLC	Food Literacy Center
GE	Green Economy
GHG	greenhouse gas
GO-Biz	California Governor's Office of Business and Economic Development
GSEC	Greater Sacramento Economic Council
GWP	global warming potential
HERO	Home Energy Renovation Opportunity
HVAC	heating, ventilation, and air conditioning
ICLEI	ICLEI—Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
KPI	key performance indicator
LCWC	Laguna Creek Watershed Council
LGO Protocol	Local Government Operations Protocol
LID	low-impact development
LRCCD	Los Rios Community College District
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
PACE	Property Assessed Clean Energy
PD	Elk Grove Police Department
PW	Elk Grove Public Works Department
RA	Resilience and Adaptation
RC	Resource Consumption
Republic	Republic Services
RS	Resilience
SacDOT	Sacramento County Department of Transportation
SacOES	Sacramento County Office of Emergency Services
SACOG	Sacramento Area Council of Governments
SacRT	Sacramento Regional Transit District
SB	Senate Bill
SBCTC	Sacramento-Sierra Building and Construction Trades Council
SCAC	Sacramento County Agricultural Commissioner

SCPH	Sacramento County Public Health
SCWA	Sacramento County Water Agency
SCWMR	Sacramento County Waste Management and Recycling
SDMP	Storm Drainage Master Plan
SEIR	Subsequent Environmental Impact Report
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SPL	Sacramento Public Library
SRBX	Sacramento Regional Builders' Exchange
STF	Sacramento Tree Foundation
SWCC	Special Waste Collection Center
TAG	Technical Advisory Group
TeamCA	Team California
TR	Transportation
VMT	vehicle miles traveled
VRF	variable refrigerant flow
WW	Solid Waste and Water
YPCCC	Yale Program on Climate Change Communication
ZEV	zero-emission vehicle

CHAPTER 1

INTRODUCTION

Chapter 1
Introduction

The City of Elk Grove (City) is committed to being a leader in sustainability and environmental stewardship. The City has prioritized climate action both communitywide and in City operations for over a decade. In 2013, Elk Grove adopted its first Climate Action Plan (CAP), a citywide plan to reduce greenhouse gas (GHG) emissions. The plan was updated in 2019 to incorporate State-recommended targets and monitor progress from the 2013 CAP.

The *Climate Compass*, an update to the 2019 CAP, not only establishes a roadmap for achieving GHG emission reduction targets, but it also includes actions and strategies to adapt to anticipated climate-related impacts. It aligns local efforts with Assembly Bill (AB) 1279, which requires California to achieve net-zero GHG emissions by 2045 and an 85 percent reduction in anthropogenic GHG emissions by 2045.

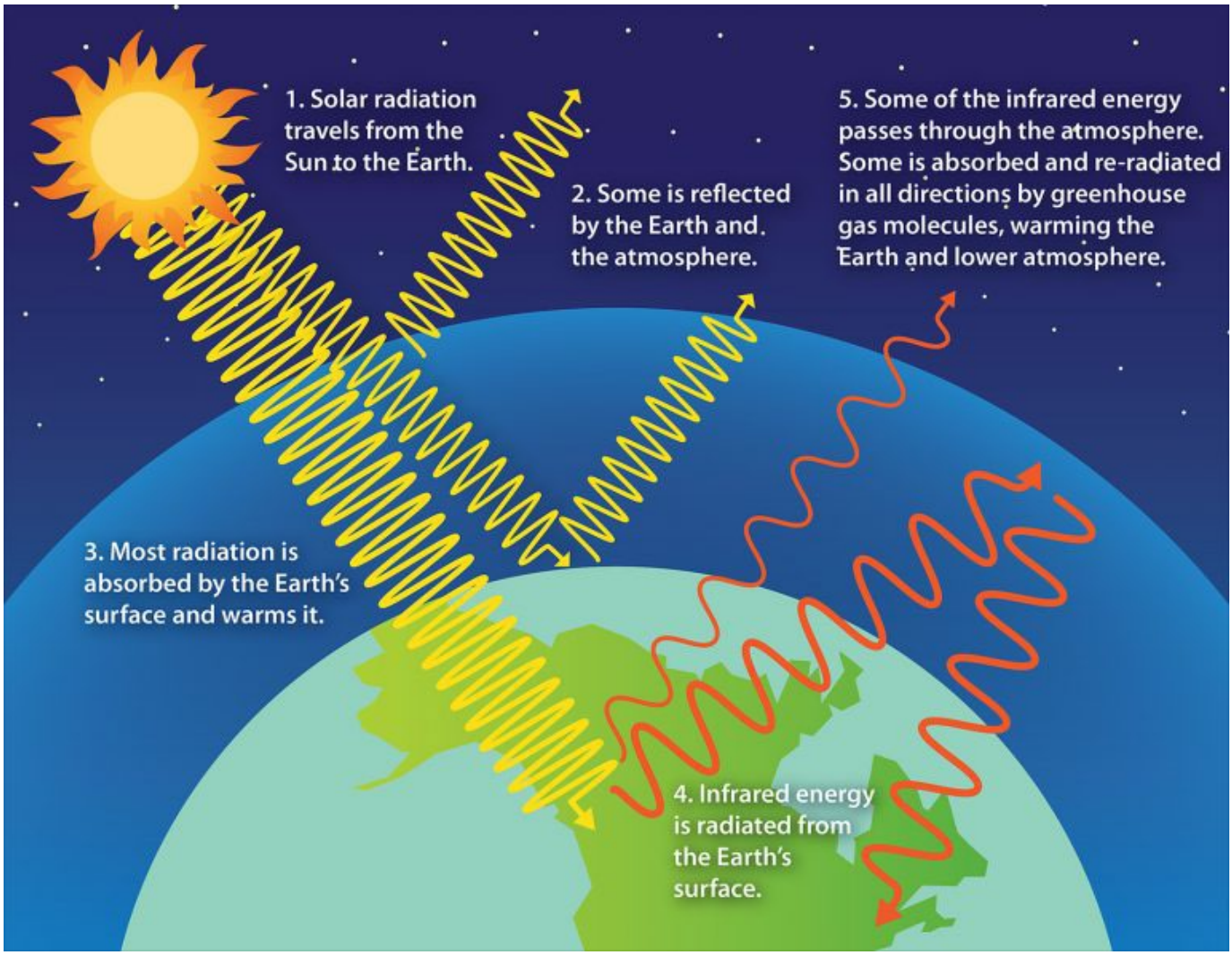
The *Climate Compass* identifies GHG reduction strategies across key sectors, including energy use, transportation, land use, and solid waste. It also outlines sustainable and adaptive infrastructure, technologies, policies, and programs the City will implement to address climate change impacts. The *Climate Compass* intends to enhance the quality of life for all residents, promote equity, and strengthen community resilience in the face of a changing climate.

1.1 CLIMATE CHANGE BACKGROUND

What is Climate Change?

The greenhouse effect, illustrated in **Figure 1-1**, is a natural process that insulates the Earth and helps regulate its temperature. After absorbing sunlight, the Earth emits heat in the form of infrared radiation. This radiation is then absorbed by a collection of naturally occurring atmospheric gases called GHGs. These gases, which consist mainly of water vapor, carbon dioxide, methane, and nitrous oxide, all act as effective global insulators by absorbing some of the infrared radiation emitted by Earth and re-emitting it back towards the planet. This process, where some heat is prevented from escaping out of the atmosphere, keeps Earth temperatures suitable for life. Without the greenhouse effect, Earth would be unable to support life as we know it.

Figure 1-1 The Greenhouse Effect



Source: University of California Regents 2024.

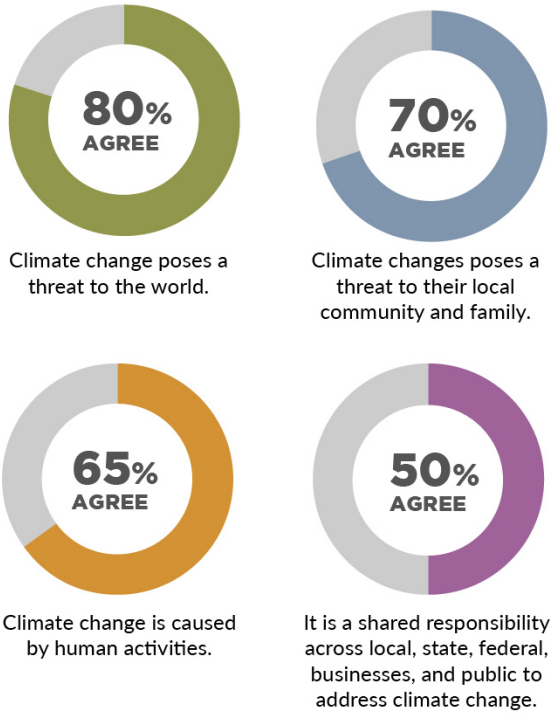
However, the combustion of fossil fuels and other human-caused activities since the Industrial Revolution in the 19th century have introduced GHGs into the atmosphere at an accelerated rate. These elevated levels of GHGs above natural ambient concentrations have caused a trend of unnatural warming of the Earth's climate. This effect, known as global climate change, is the driver behind changes in extreme weather patterns, rapid melting of the polar ice caps, an increase in sea level, and other impacts on biological resources and humans.

Local Risk Perceptions

As climate change increasingly poses a threat worldwide, people are rightfully recognizing its urgency. According to the Yale Program on Climate Change Communication, nearly 80 percent of adults in Sacramento County believe they will be affected by climate change, which is 8 percent higher than the national average; additionally, 75 percent are worried it will harm future generations (YPCCC 2023). Climate change risk perceptions in California are also notably high, exceeding national averages.

Survey results conducted during outreach and engagement for the *Climate Compass* align with local risk perceptions of Sacramento County. Eighty percent of Elk Grove residents agree or strongly agree that climate change poses a threat to the world, aligning with local risk perceptions presented by the Yale Program on Climate Change Communication. **Figure 1-2** shows survey results and local perceptions across Elk Grove survey respondents. This offers insight into how residents might respond to climate risks and, as a result, influence the *Climate Compass* process. Elk Grove residents are experiencing the effects of rising temperatures, devastating wildfires, prolonged droughts, and more frequent severe storms; and Elk Grove residents are becoming more aware of the impacts of climate change on the everyday systems they use.

Figure 1-2 Elk Grove Residents' Views on Climate Change



Local Climate Change Impacts

Like many communities in California, Elk Grove is increasingly experiencing the local impacts of climate change. One of the most significant concerns is the growing frequency and intensity of extreme weather events. The region has seen more severe flooding incidents during the winter and rainy season, which can overwhelm stormwater infrastructure, damage property, and disrupt daily life. Elk Grove has also experienced more frequent and prolonged heatwaves during the summer and dry seasons. These extreme heat events can pose serious health risks, especially to vulnerable populations such as senior citizens, young children, and those with pre-existing medical conditions.

In addition to extreme weather, Elk Grove is facing the consequences of more frequent and severe droughts, which can lead to water scarcity issues that impact food production, stress trees and vegetation, and increase reliance on groundwater. Drought conditions also increase the risk of wildfires in the surrounding region. Even when fires occur in distant parts of the state, communities are affected by the smoke and degraded air quality. Wildfire smoke can trigger respiratory issues and worsen existing health problems, disproportionately impacting sensitive groups.

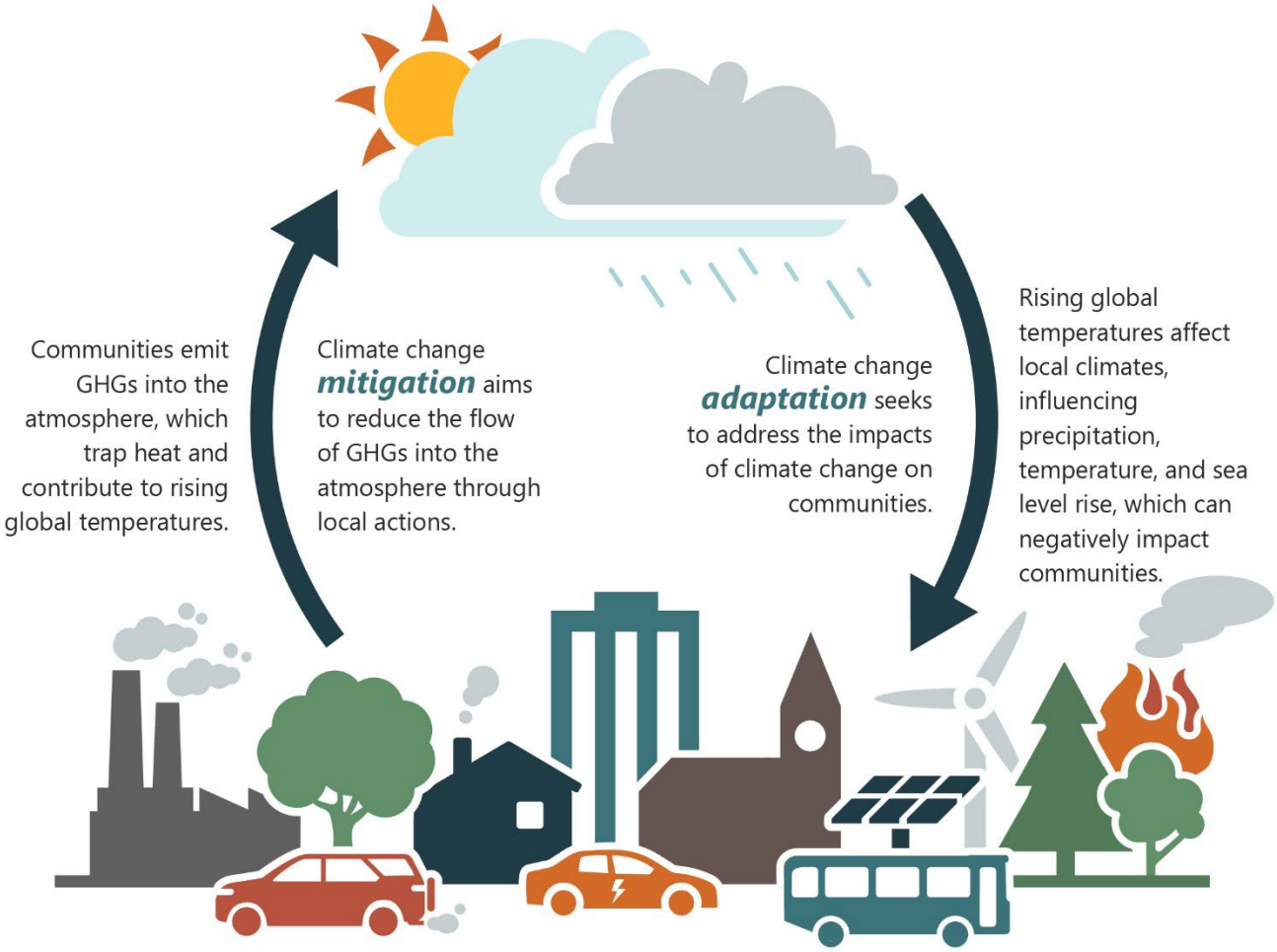
Mitigation vs. Adaptation

Addressing climate change requires an integrated approach that targets both its sources and its impacts. Efforts that focus on reducing the sources of climate change are known as climate change mitigation, GHG mitigation, or climate action. Using baseline GHG emission calculations, the City projected future emissions to develop targets and strategies aimed at reducing these emissions, thereby minimizing their contributions to climate change.

Climate change adaptation and resilience efforts help communities prepare for and adapt to the impacts of climate change. The City can measure its adaptive capacity—the ability to adjust and respond to climate-related impacts—by assessing climate-related hazards and pinpointing vulnerabilities to develop effective strategies that enhance community resilience to climate change and prepare for possible impacts.

State law requires local governments to address climate change mitigation in local planning and environmental review processes, and to address climate change adaptation in long-range planning processes, such as general plans (CalOES 2020). **Figure 1-3** illustrates the relationship between these two facets of climate change planning.

Figure 1-3 Climate Change Mitigation and Adaptation Planning



1.2 CLIMATE COMPASS OVERVIEW

Purpose and Scope

Local governments have an important role in climate mitigation and adaptation. The *Climate Compass* is a comprehensive and transformative roadmap for addressing climate change while supporting the City's broader sustainability and resilience goals. It will help the City align with State mandates (e.g., AB 1279) and community needs to enhance the quality of life for Elk Grove residents, businesses, employees, and visitors.

Goals and Objectives

In developing the *Climate Compass*, the City established goals and objectives to guide outreach and the development of local strategies and actions. By working towards these goals, the City can support a more resilient, equitable, and sustainable future for all its residents and build a framework for climate mitigation and adaptation.

To ensure the success of the *Climate Compass*, the City has established the following key goals and objectives:

- **Align with State Targets and Laws**: Ensure Elk Grove's plan aligns with California's GHG reduction goals and relevant regulations aimed at climate mitigation.
- **Decarbonize All Sectors**: Implement actions to transition Elk Grove away from fossil fuels and realize deep GHG emissions reductions over the coming decades.
- **Unite Sustainability Initiatives:** Connect and amplify existing sustainability efforts into a cohesive, impactful plan.
- **Integrate Adaptation and Resilience**: Incorporate climate adaptation and resilience actions to address Elk Grove's most pressing hazards.
- **Leverage CEQA Streamlining**: Develop a California Environmental Quality Act (CEQA) qualified plan to streamline the environmental review process for sustainability projects and climate-friendly development.
- **Engage the Community**: Communicate climate challenges and opportunities, foster climate education, and empower the community to contribute to solutions.
- **Prioritize Underserved Populations**: Ensure equitable climate action by prioritizing projects and programs that benefit historically underserved communities.

Co-Benefits

While the *Climate Compass* is primarily intended to reduce GHG emissions and address climate change-related vulnerabilities in Elk Grove, it will also result in numerous "co-benefits" to residents and businesses. Co-benefits are the additional positive outcomes that result from actions taken to reduce GHG emissions.

The *Climate Compass* identifies seven co-benefits that will result from GHG mitigation and climate adaptation strategy implementation. **Figure 1-4** highlights these co-benefits, with more detailed descriptions shared below.

The *Climate Compass* co-benefits are:

- **Equity**: Ensures fair distribution of benefits and burdens across all communities, focusing on supporting disadvantaged and vulnerable populations.
- **Air Pollution Prevention**: Decreases harmful air pollutants, improving air quality and public health outcomes.
- **Health and Wellbeing**: Contributes to improved physical and mental health and overall quality of life for the community.
- **Community Resilience**: Strengthens the ability to withstand and recover from climate-related shocks and stresses, fostering a sense of empowerment and unity in the community.

- **Infrastructure Reliability**: Enhances the reliability and durability of critical assets and infrastructure in the face of climate change impacts.
- **Resource Preservation**: Protects and preserves valuable natural resources, reducing humans' environmental footprint.
- **Economic Diversity**: Embraces innovative technologies, supports the local workforce, and promotes effective business practices that create new economic opportunities and contribute to a more diverse local economy.

Figure 1-4 Co-Benefits

1.3 CLIMATE COMPASS DEVELOPMENT

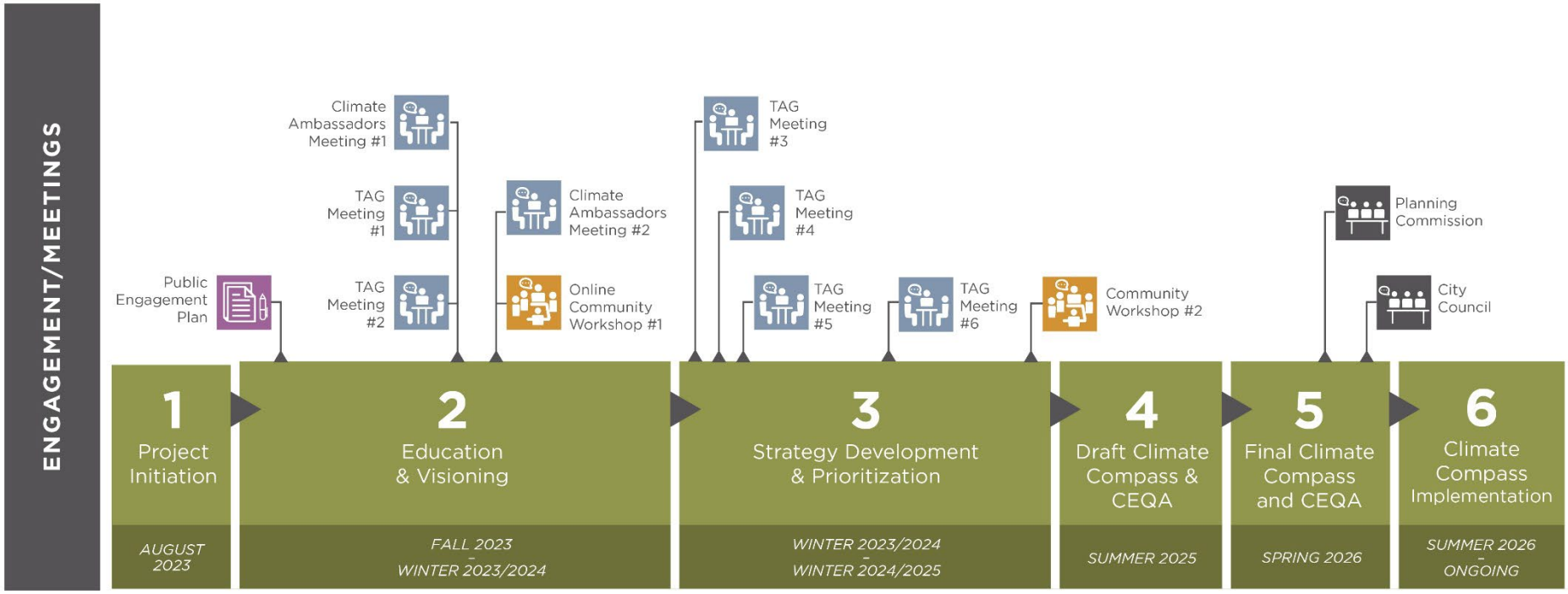
Development Timeline

The development of the *Climate Compass* took place over two years, kicking off in the summer of 2023. In late 2023, the education and visioning phase focused on preparing the GHG emissions inventory, identifying forecasts and targets, and gathering community input on Elk Grove's climate strengths, vulnerabilities, and priorities to guide the plan's development. In early 2024, the strategy development and prioritization phase took place to support GHG reduction and adaptation strategies and actions with input from City staff and subject matter experts.

The GHG emissions inventory, forecasts, and GHG mitigation and adaptation strategies were presented in the draft *Climate Compass*, released in June 2025. Feedback received on the draft *Climate Compass* was incorporated into the final *Climate Compass*. **Figure 1-5** shows the project timeline and key engagement milestones throughout the project development.

Engagement with City staff, community members, elected officials, and partner agencies and organizations was essential throughout the *Climate Compass* planning process. More details on outreach and engagement efforts are provided in the next section.

Figure 1-5 Climate Compass Project Timeline



Climate Compass: Elk Grove's Climate Action Plan Update
TAG: Technical Advisory Group

Community and Stakeholder Engagement

The City recognizes that a single entity cannot achieve effective climate action and adaptation; instead, it requires active and ongoing collaboration among residents, businesses, local government, and other agencies and organizations. To ensure that the *Climate Compass* reflects the diverse needs and priorities of the community, the City has engaged a wide range of community members throughout the plan's development process. Engagement was intended to gather valuable insights and feedback to strengthen the plan's strategies and actions. **Figures 1-6** and **1-7** depict the stakeholders consulted and the key themes that emerged from these conversations.

Figure 1-6 Community Engagement Participants and Groups

Figure 1-7 Community Engagement Feedback

PUBLIC WORKSHOPS

The City hosted external outreach events, such as public workshops, to engage communities, subject matter experts, and other interested organizations in the *Climate Compass* planning process. Public workshops aimed to share information about the goals of the *Climate Compass*, gather input on key climate-related vulnerabilities in Elk Grove, and identify community strengths to prioritize areas and actions. The first workshop, held on November 15, 2023, provided an overview of the *Climate Compass's* purpose and objectives. This workshop presented the results of the GHG emissions inventory and forecasts and offered attendees the opportunity to make initial comments on the plan's development.

On July 8, 2025, the City hosted its second community workshop to gather input on the Public Draft *Climate Compass*. The workshop was in the format of an open house, with stations that describe the focus areas and strategies of the *Climate Compass*, as well as providing information for community members looking to get involved or take action.

LOCAL EVENTS

The City also hosted informational booths at local gatherings to connect with the community in familiar locations, aiming to enhance education and outreach about the *Climate Compass*. The City sought to gather various perspectives by participating in outreach events that engaged local organizations, youth, families, and historically underserved groups. Key events included participation in popular local gatherings like the Giant Pumpkin Festival, Latin Night Market, NeighborGood Market Pop-Up, and Sundae Funday.

Local events played a role in shaping the City's approach to climate change mitigation and adaptation by hearing from communities during the planning process and ground-truthing data and technical analyses.

SURVEY

A survey was conducted in the summer of 2023, during the education and visioning phase of the project, to solicit initial feedback from residents. The goal was to gain a deeper understanding of what Elk Grove communities value, identify community strengths and weaknesses, assess local risk perceptions, and inform the development of strategies and actions.

CLIMATE AMBASSADOR PROGRAM

The Climate Ambassador Program (**Figure 1-8**) is an innovative initiative designed to directly engage Elk Grove community members in advancing Elk Grove's sustainability goals and promoting input on the *Climate Compass*. Through this program, interested residents are trained and equipped with the tools to become climate advocates within their networks, sharing knowledge and fostering conversations about sustainability topics with friends and family. By equipping Climate Ambassadors with the tools to effectively communicate climate-related topics, the program aims to improve community awareness of climate efforts and increase engagement during the *Climate Compass* planning process.

Figure 1-8 Climate Ambassador Logo

TECHNICAL ADVISORY GROUP

The Technical Advisory Group (TAG) played a crucial role in shaping the *Climate Compass*. Consisting of experts from diverse sectors, the TAG met six times at critical project stages. Members collaborated to offer sector-specific insights, helping identify unique challenges and opportunities within their respective fields. This collaborative approach supported a well-rounded and informed plan that benefited from a wide range of expertise and perspectives.

1.4 HOW IS CLIMATE CHANGE ALREADY BEING ADDRESSED?

Climate change is being addressed at both the State and local levels in California through various regulations and initiatives aimed at climate mitigation and adaptation. The City recognizes the importance of these efforts and has developed the *Climate Compass* to align with State regulations.

State Regulatory Context

AB 1279

AB 1279 (2022) sets a statewide goal for California to achieve net-zero GHG emissions and an 85 percent reduction in anthropogenic GHG emissions by 2045. The bill requires the California Air Resources Board (CARB) to work with other State agencies to develop and implement comprehensive strategies, policies, and regulations to meet this target. These efforts will focus on reducing emissions across various sectors, including energy, transportation, industry, and agriculture, while also prioritizing equity and protecting vulnerable communities. AB 1279 represents a significant step forward in California's efforts to combat climate change.

2022 SCOPING PLAN

CARB adopted the *2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan) in December 2022, providing a comprehensive roadmap for California to achieve its goal of carbon neutrality by 2045. The plan details strategies to reduce GHG emissions across sectors such as energy, transportation, industry, agriculture, and natural and working lands. Building on previous plans, it incorporates the latest scientific findings, technological advancements, and policy developments to guide the State toward a sustainable, low-carbon future. The plan emphasizes transitioning to clean energy sources, electrifying transportation and buildings, reducing vehicle miles traveled, and implementing nature-based solutions to sequester carbon. It also emphasizes environmental justice as an essential component of climate action, ensuring all communities benefit equitably.

Cities in California often choose to align their climate action and adaptation plans with statewide targets and strategies outlined in the Scoping Plan. Collaborating with State agencies, community organizations, and other stakeholders also helps with plan implementation and progress toward achieving local GHG reduction targets.

OTHER REGULATIONS

California has implemented numerous regulations and policies that have influenced the development of local climate action plans. For a comprehensive list of California's climate change regulations and policies, please refer to Berkeley Law's California Climate Policy Dashboard.

Regional and Local Climate Efforts

2030 ZERO CARBON PLAN

The Sacramento Municipal Utility District (SMUD), Elk Grove's electricity provider, has set ambitious goals to combat climate change. In 2021, SMUD's Board of Directors approved the 2030 Zero Carbon Plan, a roadmap to eliminate carbon emissions from electricity generation by 2030. This surpasses State targets, showcasing SMUD's leadership and commitment to clean energy transition. To achieve this, SMUD is investing in renewables like solar and wind power, alongside innovative technologies like battery storage. The City is working with SMUD to align goals within the *Climate Compass* and collaborate closely to promote energy efficiency, electric vehicle adoption, and renewable energy use locally and create a more sustainable community.

CAPITAL REGION CLIMATE PRIORITIES PLAN

The Capital Region Climate Priorities Plan, developed by the Sacramento Metropolitan Air Quality Management District (SMAQMD) in March 2024 through the United States Environmental Protection Agency Climate Pollution Reduction Grants Program, is a collaborative effort to address climate change regionally. It brought together local governments, agencies, and stakeholders, including the City, to prioritize strategies to combat climate change effects by reducing GHG emissions and associated co-pollutants compromising air quality (SMAQMD 2024). The plan outlines measures across three categories: built environment, transportation, and natural and working lands, while also detailing climate risks impacting surrounding cities and counties.

1.5 CLIMATE COMPASS STRUCTURE

The *Climate Compass* includes four chapters and appendices, as follows:

- **Chapter 2** provides the foundation for the *Climate Compass*, presenting the Elk Grove community's GHG emissions inventory, emissions forecasts, and the targets for reducing emissions in line with State and local goals.
- **Chapter 3** addresses the comprehensive strategies and actions the City will implement to reduce GHG emissions across various sectors, such as energy, transportation, land use, and waste management, while also promoting community resilience and adaptation to climate change impacts.
- **Chapter 4** focuses on the strategies and actions the City will adopt to reduce GHG emissions from government operations.
- **Chapter 5** details the implementation framework for the *Climate Compass*, including timelines, funding strategies, partnerships, and the monitoring and reporting processes to ensure the plan's success.
- **Appendices** include more detailed information on GHG emissions inventories and forecasts, strategy quantification, and supporting documents, such as a cost analysis and funding and financing roadmap.

CHAPTER 2

GREENHOUSE GAS EMISSIONS INVENTORIES, FORECASTS, AND TARGETS

Chapter 2
Greenhouse Gas Emissions Inventories, Forecasts, and Targets

This chapter provides the foundation for the *Climate Compass* by describing current and forecasted GHG emissions and establishing reduction targets. It summarizes Elk Grove's emissions inventories, presents a forecast scenario of potential future GHG emissions if no local actions were taken (i.e., if all strategies within the *Climate Compass* were not implemented and all existing Elk Grove climate action efforts were to cease), and sets targets for reducing emissions that align with statewide GHG reduction targets and goals for the years 2030 and 2045.

2.1 INVENTORIES

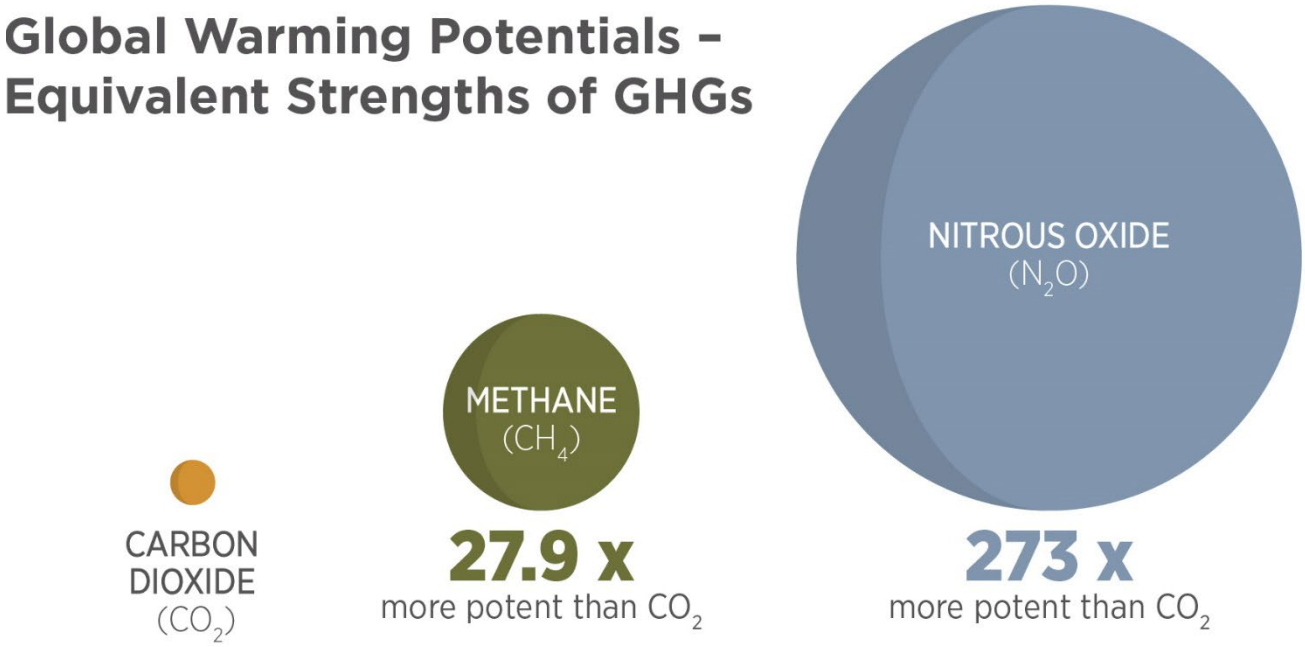
Preparing a GHG emissions inventory is the first step in the overall climate action planning process. To develop and implement a CAP that will effectively reduce GHG emissions, local governments must first understand the emissions generated by activities within their jurisdictions. GHG emissions inventories not only serve to provide this knowledge, but they also act as the basis for measuring progress and provide agencies with a framework to track emissions over time and assess the effectiveness of CAP implementation.

A GHG emissions inventory provides a detailed accounting of the sources and quantities of GHGs generated from activities within a jurisdiction's boundaries. The *Climate Compass* follows the protocol set by ICLEI—Local Governments for Sustainability (ICLEI), which develops protocols for local-scale accounting of emissions that have become the industry standard for local governments developing GHG emissions inventories.

The most recent guidance for community-scale emissions inventories is ICLEI's July 2019 publication *US Community Protocol for Accounting and Reporting of GHG Emissions, Version 1.2* (ICLEI 2019). State agencies, including CARB and the Governor's Office of Land Use and Climate Innovation, recommend that jurisdictions prepare community GHG emissions inventories using the guidelines included in the Community Protocol.

The City has been tracking GHG emissions over the past two decades, specifically for the years 2005, 2013, and 2021. The emissions inventories quantify three primary GHGs: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Emissions of these gases are converted to a comparable unit by multiplying each non-CO_2 gas by their global warming potential (GWP), enabling the reporting of emissions in terms of carbon dioxide equivalent (CO_2e). This conversion allows consideration of all gases in comparable terms and makes it easier to communicate how various sources and types of GHG emissions contribute to climate change. **Figure 2-1** illustrates the comparison of the GWP of CH_4 and N_2O with that of CO_2.

Figure 2-1 Global Warming Potentials

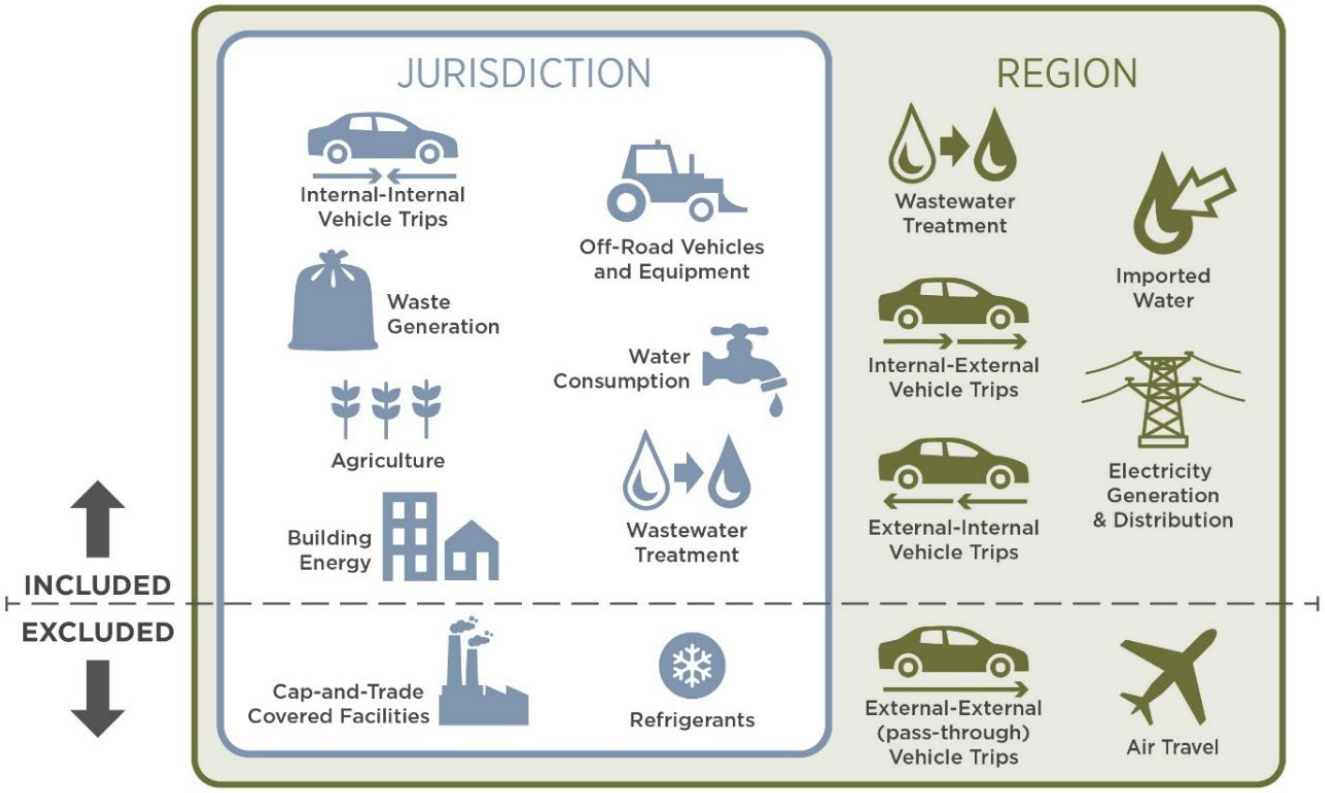


Emissions are reported in metric tons of CO_2e ($MTCO_2e$), the standard measurement for the amount of GHG emissions created and released into the atmosphere. GWP values for CH_4 and N_2O included in the Intergovernmental Panel on Climate Change's Sixth Assessment Report were used for calculating emissions estimates (IPCC 2021). The inventories include seven sectors: building energy, on-road transportation, off-road vehicles and equipment, solid waste, water supply, wastewater treatment, and agriculture. **Table 2-1** describes each GHG emissions sector and **Figure 2-2** depicts the emission boundaries of the inventory.

Table 2-1 Greenhouse Gas Emissions Sectors

Emissions Sector	Description
Building Energy	Emissions from the energy used to power, heat, and cool residential and commercial buildings.
On-Road Transportation	Emissions from cars, trucks, and other vehicles driving on roads in Elk Grove.
Off-Road Vehicles and Equipment	Emissions from vehicles and equipment used off-road, such as construction and landscaping equipment.
Solid Waste	Emissions from the disposal and decomposition of waste generated by the community.
Water Supply	Emissions from the energy used to pump, treat, and distribute water used in Elk Grove.
Wastewater Treatment	Emissions from the processes and energy used to collect, treat, and discharge wastewater.
Agriculture	Emissions from farming activities, such as crop growth, livestock, and fertilizer use within Elk Grove.

Figure 2-2 Greenhouse Gas Inventory Emission Boundaries



The inventories estimated that the community emissions were 808,410 $MTCO_2e$ in 2005, 919,407 $MTCO_2e$ in 2013, and 1,039,181 $MTCO_2e$ in 2021 (**Table 2-2**). Between 2005 and 2021, Elk Grove's total community emissions increased by 29 percent. However, when accounting for the city's growth, emissions per capita have decreased by 10 percent over the same time period (**Figure 2-3**).

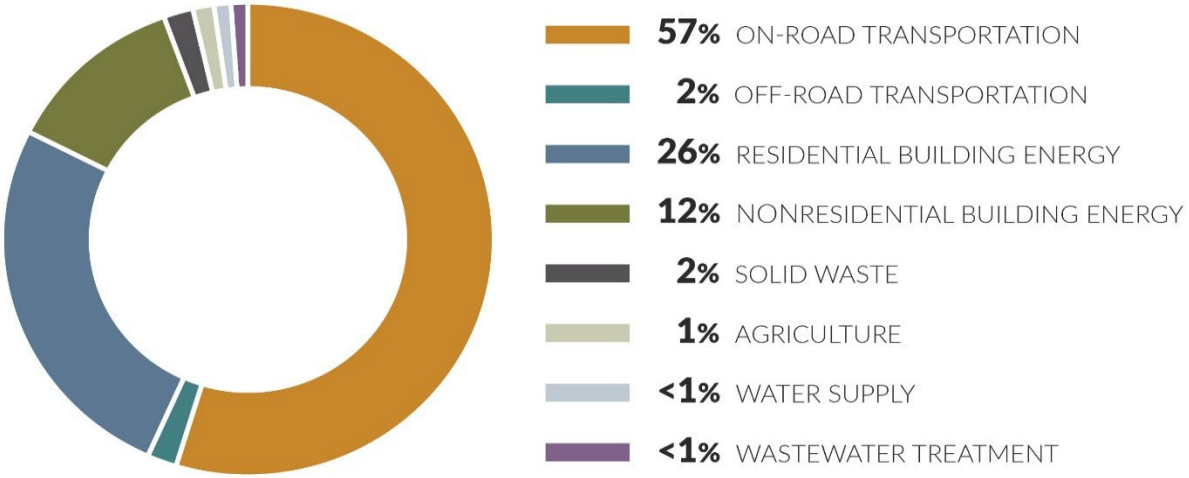
Most GHG emissions in Elk Grove came from just two sectors: on-road transportation and building energy. On-road transportation, which includes cars, trucks, and other vehicles driving within Elk Grove, accounted for more than half (57 percent) of all GHG emissions in 2021. Building energy, which encompasses both residential and commercial buildings, made up another 38 percent of emissions in 2021. Together, these two sectors were responsible for 94 percent of Elk Grove's total 2021 emissions. The remaining 6 percent of emissions came from solid waste disposal, off-road vehicles and equipment, wastewater treatment, water supply, and agricultural activities within the city limits. Elk Grove's emissions by sector in 2021 are summarized in **Table 2-2**. Additional information about the GHG emissions inventories can be found in **Appendix A.**

Table 2-2 Elk Grove Community GHG Emissions Inventories

Sector	Total GHG Emissions ($MTCO_2e$) 2005	Total GHG Emissions ($MTCO_2e$) 2013	Total GHG Emissions ($MTCO_2e$) 2021	Per Capita GHG Emissions ($MTCO_2e$/ capita) 2005	Per Capita GHG Emissions ($MTCO_2e$/ capita) 2013	Per Capita GHG Emissions ($MTCO_2e$/ capita) 2021
On-Road and Off-Road Transportation	432,170	523,680	604,560	3.46	3.21	3.37
Building Energy[1]	328,360	361,260	398,365	2.63	2.22	2.22
Solid Waste	39,360	26,260	20,222	0.31	0.16	0.11
Water Supply and Wastewater Treatment	3,070	7,177	5,759	0.02	0.04	0.03
Agriculture	5,450	1,020	10,275	0.04	0.01	0.06
Total	**808,410**	**919,407**	**1,039,181**	**6.47**	**5.64**	**5.80**
Percent Change from 2005	**N/A**	**+13%**	**+29%**	**N/A**	**-13%**	**-10%**

Notes: [1] Building Energy includes residential and non-residential buildings. Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Figure 2-3 2021 Elk Grove Community Greenhouse Gas Emissions Inventory by Sector



2.2 FORECASTS

GHG emissions forecasts are modeled estimates of future emissions levels based on current trends in activity, population, and job growth. These forecasts also account for known regulatory actions by federal and State agencies, referred to as "legislative actions," which are expected to reduce GHG emissions in the future. Emissions forecasts provide insight into the scale of local GHG emissions reductions required to achieve targets, factoring in anticipated reductions from regulatory actions.

The two forecast scenarios included in the *Climate Compass* are "business-as-usual" (BAU) scenario and "no local action" scenario to understand Elk Grove's future GHG emissions. The BAU forecast assumes that no new State or federal actions will be taken after 2021 to reduce emissions. This scenario only accounts for growth factors that could affect emissions in each sector, such as population or employment changes. On the other hand, the "no local action" scenario adjusts the BAU forecast to consider the impact of existing State and federal laws and regulations on Elk Grove's future emissions.

Both scenarios provide estimates of Elk Grove's emissions for the years 2030 and 2045. These years were chosen because they align with the GHG reduction targets set by important State laws and policies, such as Senate Bill (SB) 32 and AB 1279. By 2030, Elk Grove's population is anticipated to grow by 28 percent, and by 2045 the population is expected to grow by 72 percent compared to 2021. Moreover, job growth in Elk Grove is expected to grow at an even faster rate, with employment projected to increase by 53 percent by 2030 and more than doubling by 2045 over 2021 levels. When accounting for the changes in growth, comparing the per-capita emissions become increasingly important in understanding the underlying impacts on Elk Grove's future emissions.

"Business-as-Usual" Forecast

The BAU forecast estimates GHG emissions based on assessing how emissions generated by community activities will change over time without federal, State, or local action. The BAU forecast only includes expected employment and population changes in the future. Based on 2021 GHG emissions levels, this scenario estimates annual GHG emissions in Elk Grove will increase steadily and rise by approximately 28 percent in 2030, and 71 percent in 2045 (**Table 2-3**). While the "no local action" forecast provides a more realistic scenario for future GHG emissions, the BAU forecast offers the basis for understanding the GHG impact due to an anticipated increase in population, vehicle activity, and other growth factors in Elk Grove.

Table 2-3 Elk Grove Community GHG Emissions Inventory and BAU Forecast ($MTCO_2e$)

Sector	2021	2030	2045
On-Road Transportation	586,220	718,743	926,109
Residential Building Energy	271,900	347,631	466,486
Nonresidential Building Energy	126,465	193,762	298,428
Solid Waste	20,222	26,034	36,165
Off-Road Vehicles and Equipment	18,341	25,296	36,158
Agriculture	10,275	4,372	1,154
Wastewater Treatment	2,957	6,707	9,317
Water Supply	2,802	3,731	5,183
Total	**1,039,181**	**1,326,277**	**1,779,000**
BAU Percent Change from 2021 Levels	**N/A**	**+28%**	**+71%**

Notes: Totals may not sum exactly due to independent rounding; BAU = business-as-usual; $MTCO_2e$ = metric tons of carbon dioxide equivalent
N/A = not applicable.

"No Local Action" Forecast

The no local action emissions forecast evaluates how Elk Grove's GHG emissions will change over time, accounting for legislative actions at the federal and State levels, such as regulatory requirements to increase vehicle fuel efficiency. This forecast scenario provides the City with the information needed to focus efforts on specific emissions sectors and sources with the most GHG reduction opportunities. **Table 2-4** provides a summary of the legislative reductions applied to the no local action forecast.

NO LOCAL ACTION FORECAST:

Emissions are projected to decrease from 2021 levels:

7% by 2030

53% by 2045

Accounting for the reductions described in **Table 2-4**, the results indicate that emissions are expected to decline from 2021 levels through 2045. **Table 2-5** and **Figure 2-4** illustrate the forecasted gradual decrease in GHG emissions through 2045.

Figure 2-5 shows the projected change in per capita emissions through 2045. It is important to note that legislative reductions are constantly evolving, so the no local action forecast may be a conservative estimate. Additional information about the forecasts can be found in **Appendix B**.

Table 2-4 Legislative Reductions Used in No Local Action Forecast

Source	Legislative Reduction	Description	Sector(s) Applied
State	SB 100 (The 100 Percent Clean Energy Act of 2018)	Requires that 60 percent of retail electricity sold in California must come from renewable or zero-carbon resources by 2030 and 100 percent by 2045.	Residential and Nonresidential Building Energy
State	SB 1020 (Clean Energy, Jobs, and Affordability Act of 2022)	Requires eligible renewable and zero-carbon energy resources to supply 90 percent of California's retail electricity sales by the end of 2035, 95 percent by the end of 2040, and 100 percent by the end of 2045. Additionally, it requires that 100 percent of electricity procured for State agencies come from these sources by the end of 2035.	Residential and Nonresidential Building Energy
State	California's Building Energy Efficiency Standards (2019 and 2022 Title 24, Part 6)	Effective January 1, 2023, new residential and nonresidential buildings in California must comply with energy efficiency standards set by the California Energy Commission. The 2022 standards require energy-efficient building practices focused on decarbonization, emphasizing the use of electric heat pumps for space and water heating, and promoting the integration of photovoltaic and battery storage systems along with other demand-flexible technologies to work with heat pumps.	Residential and Nonresidential Building Energy
State	Advanced Clean Car I Regulations	Establishes GHG emission reduction standards for model years 2017 through 2025 that are more stringent than federal CAFE standards.	On-Road Transportation
State	Advanced Clean Cars II Regulations[1]	Establishes a target for all new passenger cars, trucks, and SUVs sold in California to be 100 percent zero-emission vehicles by 2035.	On-Road Transportation
State	Advanced Clean Fleets[2]	Starting in 2036, all medium- and heavy-duty trucks used in local government fleets in California must be zero emissions with limited exceptions. In addition, local government fleet owners must also purchase electric trucks on an accelerated timeline.	On-Road Transportation
State	Truck and Bus Regulation	Requires diesel trucks and buses that operate in California to be upgraded to reduce GHG emissions.	On-Road Transportation
Federal	Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles	Establishes fuel efficiency standards for medium- and heavy-duty engines and vehicles.	On-Road Transportation
Federal	EPA Off-Road Compression-Ignition Engine Standards	Establishes standards for phasing of EPA diesel engine tiers for off-road compression-ignition equipment.	Off-Road Vehicles and Equipment

Notes: CAFE = Corporate Average Fuel Economy; EPA = US Environmental Protection Agency; GHG = greenhouse gas; SB = Senate Bill.

[1] As of June 2025, the U.S. Congress voted to limit California's authority to regulate vehicle emissions under existing programs provided through a waiver of the Clean Air Act. California is challenging the legality of this vote and given the pending litigation, the assumption of these programs remains for the purpose of the Elk Grove *Climate Compass*.

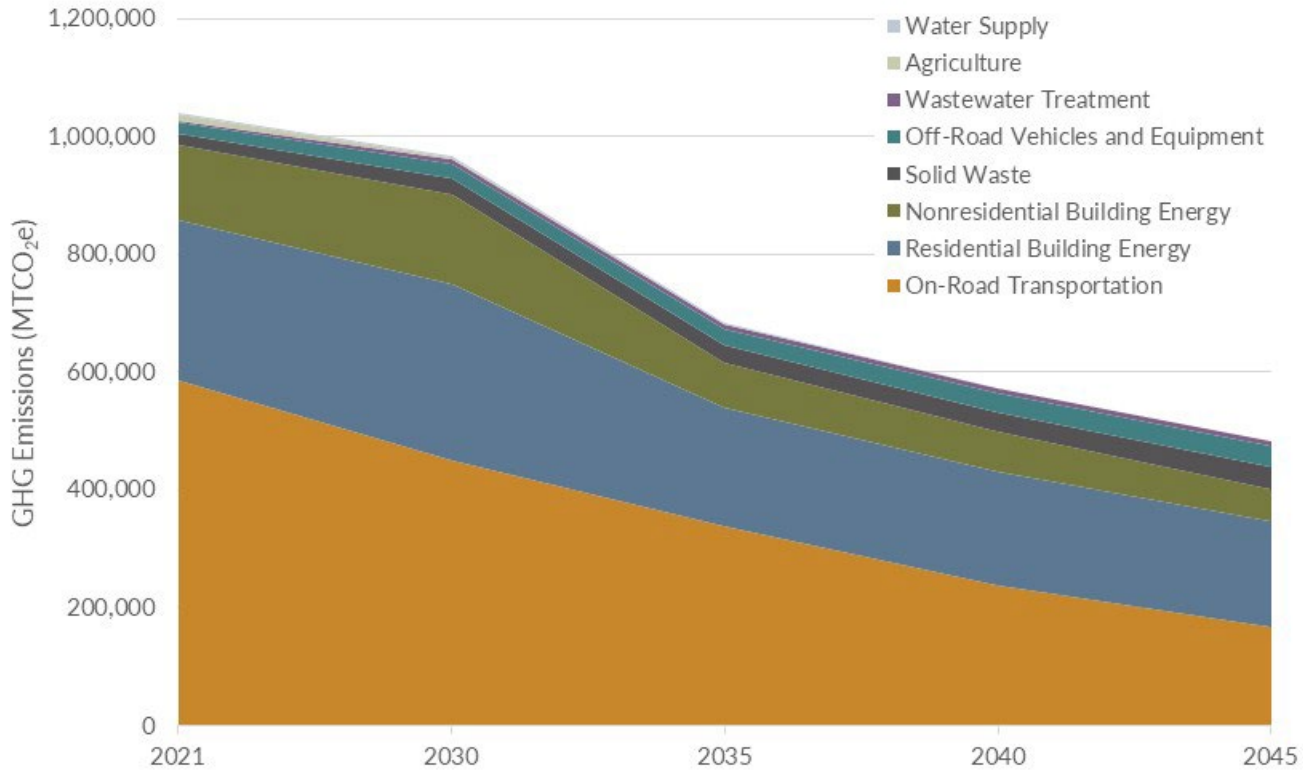
[2] On January 13, 2025, CARB withdrew its request for a waiver and authorization for the addition of the Advanced Clean Fleets (ACF) Regulation to its emissions control program. As of June 2025, CARB is evaluating next steps and is not enforcing the existing portions of the ACF Regulation that require a federal waiver or authorization, such as the portions of the ACF Regulation that apply to high priority and drayage fleets. However, not all elements of the ACF Regulation require a federal waiver or authorization and the State and local government fleets portion of the ACF Regulation remains unaffected. The ACF Regulation is only applied to the City of Elk Grove government operations' emissions forecast presented in Chapter 4.

Table 2-5 Elk Grove Community GHG Emissions Inventory and No Local Action Forecast ($MTCO_2e$)

Sector	2021	2030	2045
On-Road Transportation	586,220	449,118	166,840
Residential Building Energy	271,900	299,782	178,777
Nonresidential Building Energy	126,465	152,746	55,643
Solid Waste	20,222	26,034	36,165
Off-Road Vehicles and Equipment	18,341	25,296	36,158
Agriculture	10,275	3,869	575
Wastewater Treatment	2,957	6,707	9,317
Water Supply	2,802	2,875	0
Total	**1,039,181**	**966,427**	**483,474**
"No Local Action" Percent Change from 2021 Levels	**N/A**	**-7%**	**-53%**

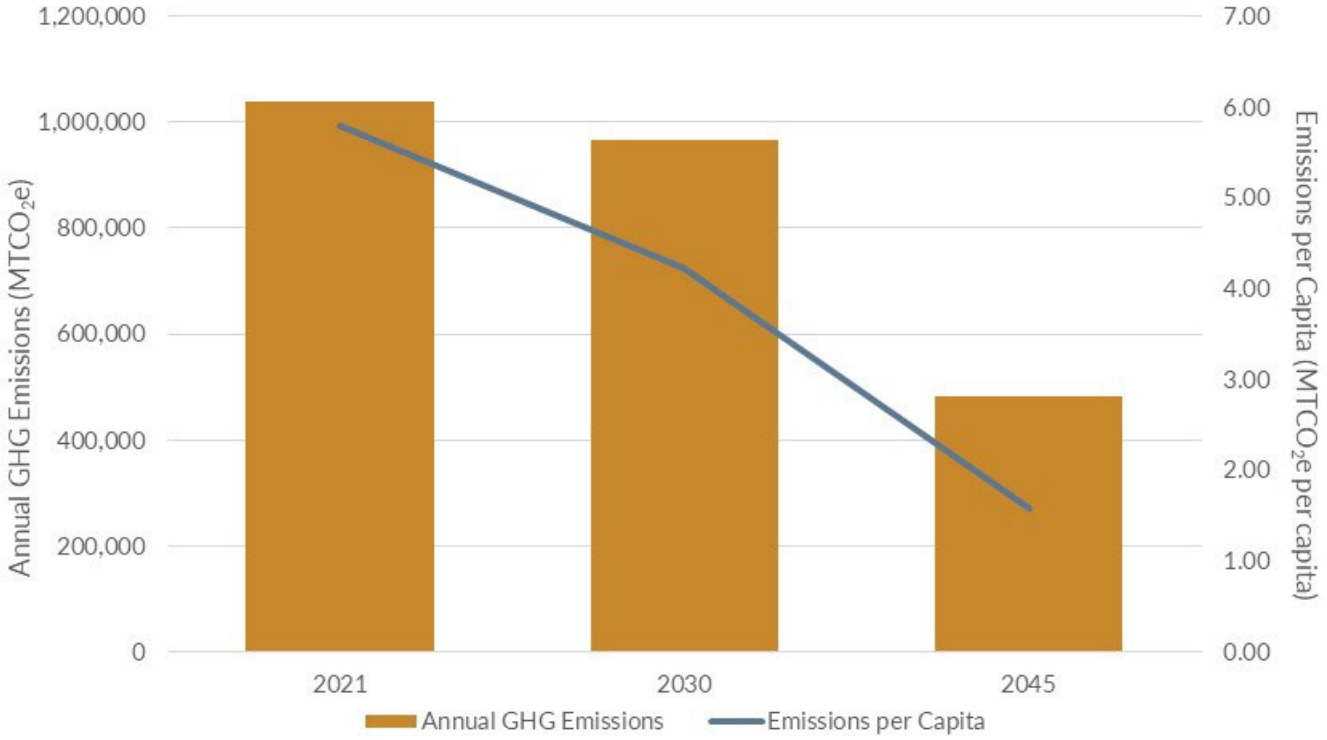
Notes: Totals may not sum exactly due to independent rounding; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Figure 2-4 Elk Grove Community GHG Emissions Inventory and No Local Action Forecast



Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Figure 2-5 Elk Grove Community GHG Emissions Inventory and No Local Action Forecast Per Capita Comparison



Note: For comparison purposes, results shown in this chart have been adjusted for global warming potential factors from IPCC's Fifth Assessment Report.

2.3 TARGETS

The emissions reduction targets in the *Climate Compass* have been established to be consistent with statewide GHG targets. The City is seeking consistency with these targets because they were determined to be technologically and financially feasible through analysis by CARB. The City does not intend to place undue burden on community members by seeking to adopt overall targets that are more stringent than those set by the State of California. As directed in SB 32 and AB 1279, the State aims to reduce annual GHG emissions to:

- 40 percent reduction below 1990 levels by 2030,
- 85 percent reduction in anthropogenic emissions below 1990 levels by 2045, and
- net zero GHG emissions by 2045.

CARB's 2022 Scoping Plan is the State's plan for meeting the targets set forth in AB 1279. CARB's analysis shows that to meet these ambitious targets by 2045, the 2022 Scoping Plan assumes a steeper reduction for interim years than is required under SB 32 (which requires a 40 percent reduction from 1990 levels by 2030). The 2022 Scoping Plan shows that the GHG emission reduction needed to remain on a trajectory of 85 percent reduction by 2045, statewide emissions must be reduced by 48 percent below 1990 levels by 2030.

The City aims to reduce GHG emissions in proportion to the State's targets and goals, inclusive of the analysis conducted for the 2022 Scoping Plan. Community emissions levels from 1990 are not available, which is the case for most local jurisdictions in California. Thus, community GHG reduction targets for the *Climate Compass* were developed relative to Elk Grove's emissions in 2021 and established in proportion with statewide reduction for all emissions sectors relevant to the City's jurisdiction, consistent with CARB guidance. Estimating equivalent reductions

needed from the 2021 baseline, the City aims to reduce emissions to:

- 39 percent below 2021 levels by 2030 (638,812 $MTCO_2e$) and
- 85 percent below 2021 levels by 2045 (160,976 $MTCO_2e$).

Elk Grove's 2030 target requires GHG emission to be reduced by 327,615 $MTCO_2e$. The 2045 target requires that community emissions be reduced by 322,498 $MTCO_2e$. Achievement of the targets will require significant investments at the State and local levels to transform the transportation and energy sectors to low- and zero-carbon.

2.4 EMISSIONS GAP

State and federal regulations alone will not be sufficient to achieve Elk Grove's GHG emissions reduction targets. The City needs to implement additional actions to close the remaining "emissions gap" and achieve its reduction targets. **Table 2-6** and **Figure 2-6** display Elk Grove's forecasted community emissions, targets, and the emissions gap.

The *Climate Compass* is focused on achieving the 2030 and 2045 targets. **Chapter 3** provides details on how Elk Grove can take local action to meet these targets over the coming years.

Table 2-6 Elk Grove Community GHG Emissions Gap ($MTCO_2e$)

	2021	2030	2045
BAU Emissions	1,039,181	1,326,277	1,779,000
No Local Action Emissions	1,039,181	966,427	483,474
Target Percent below 2021 Levels	N/A	39%	85%
Target Annual Emissions	N/A	638,812	160,976
Emissions Gap	N/A	327,615	322,498

Notes; BAU = business-as-usual; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Figure 2-6 Elk Grove Community GHG Emissions Gap

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

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CHAPTER 3

CLIMATE ACTION STRATEGIES

Chapter 3
Climate Action Strategies

This chapter presents the strategies and actions that the City will implement to reduce communitywide GHG emissions and adapt to climate change impacts. These locally based initiatives are organized into six focus areas, including descriptions of implementation actions, GHG reduction potential, and associated co-benefits.

3.1 OVERVIEW

The *Climate Compass* outlines 21 strategies and 79 actions to reduce GHG emissions and address climate impacts in Elk Grove. These strategies are grouped into six focus areas: buildings and energy, transportation, resilience and adaptation, resource consumption, green economy, and climate action commitment. Together, they provide the foundation for advancing emissions reductions and climate resilience across the city.

Each strategy is supported by specific actions that outline the steps needed to implement, enhance, or put the broader strategies into practice. These actions may include programs, policies, projects, partnerships, or other initiatives the City will lead to meet its mitigation and adaptation goals. While focused primarily on reducing GHG emissions and building climate resilience, many actions will also produce one or more of the seven co-benefits identified in **Chapter 1**: community resilience, economic diversity, equity, air quality improvement, health and wellbeing, infrastructure reliability, and resource conservation.

The strategies and actions were developed based on multiple inputs, including the City's GHG emissions inventory and forecast, public and expert engagement, staff feedback, and the latest climate action planning guidance. Where applicable, key performance indicators (KPIs) have been identified for 2030 and/or 2045. KPIs are measurable indicators that track how effectively the City is meeting its climate objectives, helping to quantify progress and establish milestones toward mitigation and adaptation targets. **Table 3-1** outlines the key components of each strategy included in the *Climate Compass*.

KPIs have been prioritized for sectors with the largest GHG emissions. It is important to note that meaningful, reliable, and regularly measurable indicators are not available for every strategy or action. Some strategies and actions could not be quantified or assigned KPIs due to limited data availability or a lack of suitable measurement methods. Nevertheless, strategies without KPIs are included for their expected contributions to address climate mitigation and adaptation and have specific objectives they aim to meet.

Table 3-1 Strategy Framework Description

Categories	Description
Focus Area	Serve as overarching themes that guide the city's climate action, encompassing multiple strategies that align with Elk Grove's values and long-term vision for a sustainable future.
Strategy	Addresses specific challenges within each focus area. Strategies provide a framework that include actions to help mitigate GHG emissions and adapt to climate change.
Action	Specific activities, projects, programs, or policies the City will implement to support GHG mitigation or adaptation strategies. Actions are concrete steps that directly contribute to achieving the city's climate goals.
Key Performance Indicator	Quantifiable metrics to assess the effectiveness and progress of the *Climate Compass* implementation. They serve as benchmarks for success, allowing the City to identify areas needing improvement, and communicate progress to stakeholders and the public in a clear, data-driven manner.

3.2 GAP ANALYSIS

A critical component of the *Climate Compass* is understanding whether the proposed strategies will achieve Elk Grove's GHG reduction targets. Based on the analysis conducted, the City has quantified the potential emissions reductions from quantifiable strategies to determine if they collectively bridge the emissions "gap" between the no local action forecast and target levels.

The analysis shows that the suite of strategies and actions will yield total GHG emissions reductions of 380,646 $MTCO_2e$ by 2030 and 333,017 $MTCO_2e$ by 2045. When compared to the reductions needed to meet the established targets (327,615 $MTCO_2e$ for 2030 and 322,498 $MTCO_2e$ for 2045), the City is projected to exceed both targets, with a surplus of 53,031 $MTCO_2e$ in 2030 and 10,519 $MTCO_2e$ in 2045, shown in **Table 3-2**.

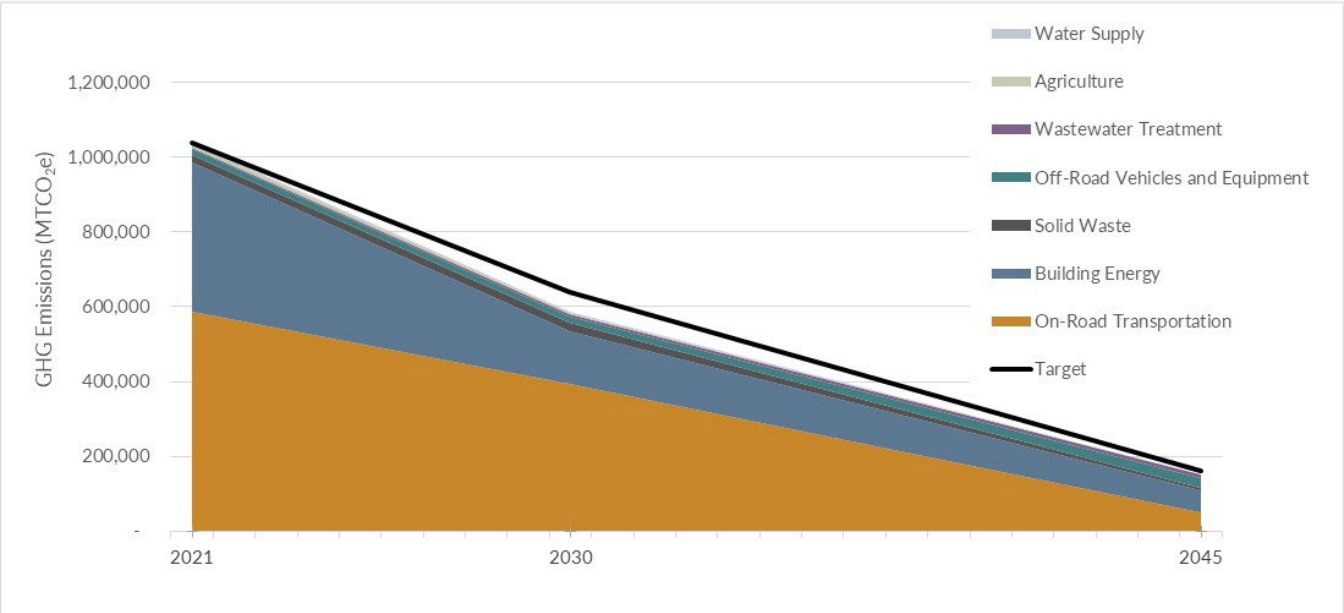
While not all strategies can be quantified, they remain valuable contributors to the city's climate action and adaptation efforts. The quantifiable GHG reductions come primarily from the building and energy focus area, followed by transportation, with additional contributions from resource consumption, resilience, and adaptation strategies. As shown in **Figure 3-2**, the gap analysis confirms that the strategies outlined in this chapter provide Elk Grove with a viable pathway to achieve its climate goals of 39 percent reduction in 2030 and 85 percent reduction in 2045 below 2021 levels, supporting the City's commitment to meaningful climate action. Additional information on strategy-specific reductions and other related quantification can be found in **Appendix C**.

Table 3-2 Elk Grove Community Gap Analysis

	2030	2045
Total Reductions from Strategies ($MTCO_2e$)	380,646	333,017
Reduction Needed to Meet Target ($MTCO_2e$)	327,615	322,498
Target Percent Reduction Below 2021 Levels	39%	85%
Target Met?	**Yes**	**Yes**
Remaining Gap to Target ($MTCO_2e$)	-53,031	-10,519

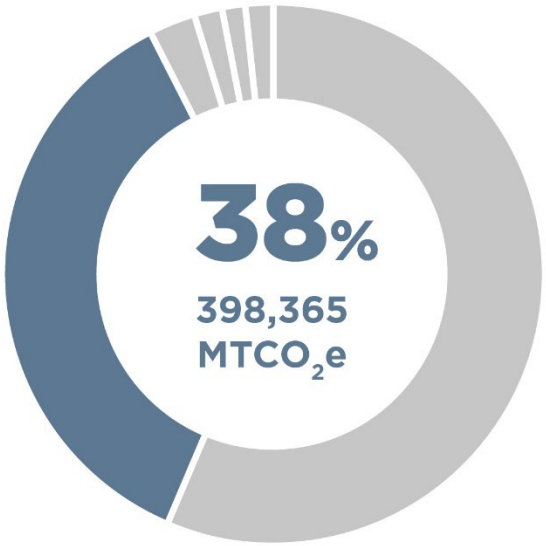
Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Figure 3-1 Climate Compass Strategies and GHG Emission Reduction Targets



Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

BUILDINGS AND ENERGY



Total Emissions from Residential and Nonresidential Building Sectors in 2021

The buildings and energy sector is a major contributor to Elk Grove's GHG emissions, accounting for 38 percent of the total. Within the building sector, 68 percent of emissions come from residential buildings and 32 percent from nonresidential buildings.

Reducing energy use from buildings requires a comprehensive approach that addresses both new and existing structures. New residential development offers opportunities to incorporate energy-efficient designs and all-electric systems from the outset. For existing homes, practical retrofit solutions and energy efficiency upgrades are essential. Similarly, new commercial projects can integrate advanced energy systems during the planning phase, while older commercial and industrial buildings require targeted strategies to reduce energy consumption.

While State legislation will support emissions reductions, local action is essential for Elk Grove to meet its GHG targets. By adopting forward-looking building standards and collaborating with SMUD, the City will promote a low-carbon built environment that supports more livable, resilient, and affordable communities.

Sector Statistics:

- **55K** existing residential units
- **92%** single-family units & ADUs; **8%** multifamily
- In 2021, **63%** of building emissions came from electricity and **37%** from natural gas
- **10,149** additional housing units to be built between 2021-2029

STRATEGY BE-1

Electrify and Decarbonize Buildings

GHG Reduction Potential

By 2030: 30,882 $MTCO_2e$
By 2045: 176,030 $MTCO_2e$

Key Performance Indicators

By 2030:

- 50% of new residential and nonresidential development is all electric.
- 14% of existing residential buildings are retrofitted to be all electric.
- 9% of existing nonresidential buildings are retrofitted to be all electric.

By 2045:

- 100% of new residential and nonresidential development is all electric.
- 68% of existing residential buildings are retrofitted to be all electric.
- 46% of existing nonresidential buildings are retrofitted to be all electric.
- 2,778 low-income housing units replace gas-powered HVAC units with heat pumps HVAC and heat pump water heaters.
- 100% of existing single-unit residential install heat pumps when replacing air conditioners.

Co-Benefits

Strategy Summary

Nearly 45 percent of residential and 20 percent of nonresidential buildings in Elk Grove currently rely on natural gas. Enhancing energy efficiency in homes and businesses is essential for reducing natural gas consumption and GHG emissions. A key aspect of this strategy involves transitioning from natural gas-powered heating and appliances to electric alternatives to reduce emissions. Retrofitting homes with more efficient appliances and making electrification upgrades accessible not only reduces energy consumption but also improves indoor air quality by eliminating pollution from natural gas stoves. Elk Grove will further minimize emissions through efforts that encourage all-electric and energy-efficient development for new buildings and partnerships with SMUD.

Implementing Actions

Action BE-1.1a: Adopt by ordinance a new building reach code (based on cost-effectiveness studies, stakeholder outreach, and California Energy Commission approval) setting energy efficiency standards that must be met by all nonresidential new construction and major renovations.

Action BE-1.1b: Promote and encourage voluntary actions for the construction of new residential buildings that provide greater energy efficiency and reduced GHG emissions than otherwise required by the building codes.

Action BE-1.2: Develop a comprehensive building energy retrofit plan to transition existing residential and nonresidential buildings to all-electric.

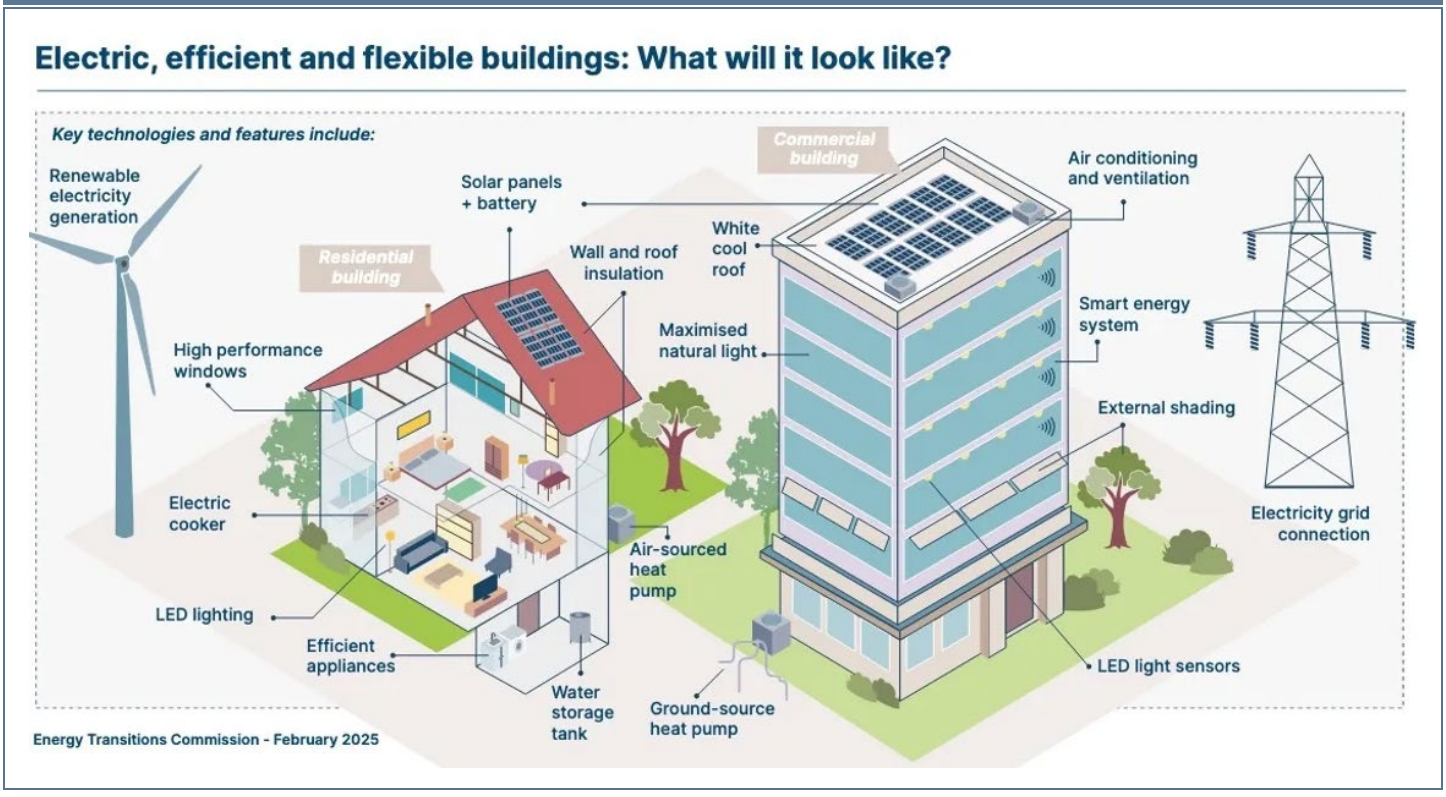
Action BE-1.3: Explore partnerships with regional organizations or grant opportunities to develop a funding mechanism (e.g., revolving loan fund, grant program) to support low-income households with covering the cost of time-of-replacement/emergency replacement of water heaters and/or HVAC units with electric options, as well as any necessary electrical upgrades.

Action BE-1.4: Partner with SMUD to explore offering on-bill financing or pay-as-you-save programs specifically for building electrification projects.

Action BE-1.5: Adopt by ordinance a standard that is compliant with State and Federal law for the conversion of HVAC to heat pump systems for existing nonresidential buildings.

What does decarbonization and electrification look like in residential and commercial buildings?

Homes and commercial buildings eliminate GHG emissions by replacing fossil fuel systems with clean, efficient technologies. These buildings integrate renewable energy sources and electric retrofits to reduce energy use, lower costs, and improve indoor comfort and air quality. The result is a smarter, healthier, and more climate-resilient built environment.



Source: Energy Transmission Commission 2025.

STRATEGY BE-2

Increase Density and Expand Affordable Housing

GHG Reduction Potential

Included in Strategy TR-1

Key Performance Indicator

By 2030:

- 11% reduction in VMT along major transit corridors due to increased density, continuing through 2045.

Co-Benefits

ECONOMIC DIVERSITY

EQUITY

HEALTH AND WELLBEING

Strategy Summary

As a growing city, the City of Elk Grove is committed to providing affordable housing options for residents across all income levels. By increasing density and incentivizing affordable housing development, the City aims to address housing insecurity and enhance livability. These efforts help reduce GHG emissions by fostering more compact, walkable communities and decreasing vehicle miles traveled (VMT). Through innovative growth principles, Elk Grove seeks to prioritize affordable housing while advancing broader climate goals.

Implementing Actions

Action BE-2.1: Prepare and adopt land use plan and zoning revisions that increase the allowed density and intensity of development along the city's major transit corridors.

STRATEGY BE-3

Increase Local Renewable Energy Use and Storage

GHG Reduction Potential

By 2030: 280,438 $MTCO_2e$
By 2045: 0 $MTCO_2e$

Key Performance Indicator

<u>By 2030:</u>

- 100% carbon-free electricity for all end uses in the city, continuing through 2045.

Co-Benefits

Strategy Summary

In 2021, electricity consumption accounted for 55 percent of energy use in residential buildings and 80 percent in nonresidential buildings. Transitioning to renewable energy sources and expanding energy storage capacity are important steps toward reducing our carbon footprint and enhancing energy resilience. Collaborating with SMUD to make renewable energy and battery storage upgrades more accessible for residents and businesses will help facilitate these transitions.

Implementing Actions

Action BE-3.1: Support and coordinate with SMUD in executing its *2030 Zero Carbon Plan*.

Action BE-3.2: Partner with SMUD to expand and strengthen existing participation incentives for their *Virtual Power Plant Pilot Program*, where customers' private solar and battery storage systems can be aggregated and utilized as a renewable, resilient, and reliable backup power supply during emergencies or peak demand periods.

STRATEGY BE-4

Reduce Energy Consumption and Energy Burden

GHG Reduction Potential

Included in Strategy BE-1

Objectives

- Expand access to energy efficiency programs.
- Improve building energy performance tracking.
- Reduce energy burdens for low-income households through targeted support.

Co-Benefits

COMMUNITY RESILIENCE

ECONOMIC DIVERSITY

EQUITY

Strategy Summary

Many residents, particularly those living in older homes or from lower-income households, face high energy burdens, meaning a disproportionate share of their income is spent on energy costs. By reducing overall energy consumption and providing targeted support to those most affected, Elk Grove can lower GHG emissions while promoting a more resilient and equitable community. Efforts will focus on expanding access to energy efficiency programs, improving building energy performance tracking, and supporting residents facing high energy costs.

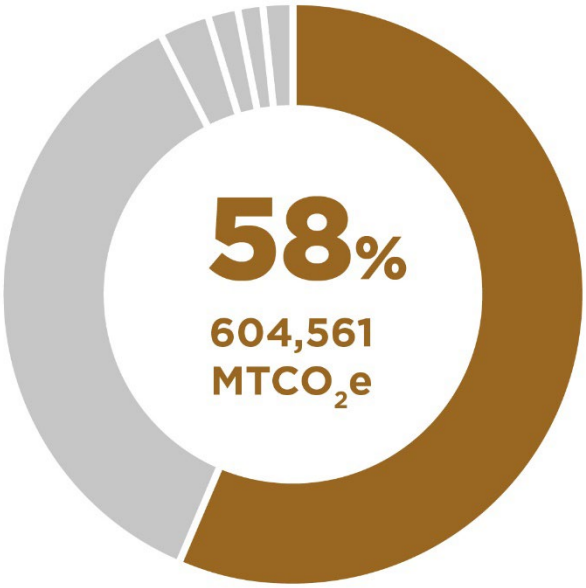
Implementing Actions

Action BE-4.1: Establish a program that connects owners and occupants of residential and nonresidential buildings to existing energy audit and weatherization programs (e.g., California's *Low-Income Weatherization Program*) and resources, and additionally, helps to determine eligibility.

Action BE-4.2: Partner with SMUD to promote and expand upon their *Home Performance Program*, which bundles various residential energy efficiency upgrades (e.g., heating and cooling systems, heat pump water heaters, air sealing, and insulation) to deliver more savings, comfort, and rebate options.

Action BE-4.3: Coordinate with SMUD to promote their Energy Assistance Program Rate for low-income residential customers, which provides a monthly discount on a qualified customer's energy bill, to ensure all eligible residents are enrolled at this rate.

TRANSPORTATION



Total Emissions from On- and Off- Road Transportation Sectors in 2021

Transportation is Elk Grove's largest source of GHG emissions, making up 58 percent of total community emissions. On-road vehicles contribute 56 percent of communitywide emissions and off-road sources contribue 2 percent.

VMT is a primary driver of on-road transportation emissions. How far people travel often depends on community design and the transportation options available. The strategies in this section aim to reduce reliance on driving by encouraging more compact, connected development, expanding reliable public transit, and creating safer, more inviting streets for walking and biking. In addition to reducing VMT, these strategies also support a transition to cleaner vehicles by expanding Elk Grove's electric vehicle (EV) charging network, providing EV incentives, and addressing emissions from off-road vehicles and equipment.

Tackling transportation emissions requires collaboration across agencies and levels of government. Partnerships with the Sacramento Regional Transit District (SacRT), Elk Grove Unified School District (EGUSD), and multifamily property owners are essential for expanding transit access, improving safety on routes to school, and increasing EV charging at homes and community hubs. While State policies and emerging technologies will help improve vehicle efficiency, local leadership plays a critical role in reducing car dependency and shaping a more sustainable transportation system.

Sector Statistics:

- **3%** of households do not have access to a car
- **22%** of households have access to only one car
- **78%** of residents drive alone to work
- **147** miles of new bikeways are proposed over the next 20 years
- By 2045, an estimated **85%** of light-duty vehicles on California roads will be zero-emission.

STRATEGY TR-1

Decrease Vehicle Miles Traveled

Reduction Potential

By 2030: 4,864 $MTCO_2e$
By 2045: 5,281 $MTCO_2e$

Key Performance Indicators

By 2030:

- 45 miles of new sidewalks installed.
- 50 miles of new bike lanes installed.
- 2.3% VMT reduction achieved through transit system upgrades.
- 1% reduction in commute VMT achieved through the development of a local Transportation Management Agency.

By 2045:

- 147 miles of new bike lanes installed.
- 15% VMT reduction achieved through transit system upgrades.

Co-Benefits

Strategy Summary

Reimagining transportation infrastructure and prioritizing transit-focused actions are essential for developing a connected, accessible, and multi-modal transportation network. Making walking, cycling, and public transit options more accessible helps reduce reliance on personal vehicles. To reduce VMT, the City is committed to expanding infrastructure for active transportation, investing in public transit services, and fostering a culture of sustainable mobility to support local climate action and GHG reduction goals.

Implementing Actions

Action TR-1.1: Implement the infrastructure, programmatic, and policy recommendations included in the Bicycle, Pedestrian, and Trails Master Plan.

Action TR-1.2: Coordinate with SacRT to improve the city's public transit system by increasing reliability and accessibility as well as by adding amenities such as seating, lighting, tree cover, and real-time arrival information displays. Extend service hours and routes to better serve residential areas, employment centers, and popular destinations, with a focus on "Transportation-Based Priority Populations" as identified by Caltrans' Transportation Equity Index.

Action TR-1.3: Develop a local Transportation Management Agency, which works with residences and businesses to provide education on transit and alternative transportation services and programs, and provides other supportive programs that work to reduce VMT and increase transit use.

Action TR-1.4: Expand an electric bike (e-bike) incentive program to encourage residents to purchase and use e-bikes for commuting and local trips instead of driving. Incentives will be provided as subsidies or discounts on e-bike purchases.

Action TR-1.5: Partner with EGUSD to establish and better monitor Safe Routes to School programs aimed at promoting safe walking, biking, and other active transportation modes for students and families.

Action TR-1.6: Work with existing multi-unit building owners and require new multi-unit developments to install e-bike charging and secure bicycle parking in multifamily residential developments.

Action TR-1.7: Develop public awareness campaigns promoting the benefits of active transportation, public transit, and ridesharing.

Action TR-1.8: Identify opportunities to create new ingress and egress pathways for bicycles and pedestrians within existing residential subdivisions. Require new developments to double the number of pathways compared to current standards.

What Can I Do?

Looking to reduce your vehicle use in Elk Grove? Here are some actions to consider:

- **Use public transit:** Utilize buses, trains, or e-tran services for commutes and trips.
- **Walk or cycle:** Choose active transportation for short journeys to nearby destinations.
- **Support local businesses:** Shop at neighborhood stores to minimize travel distances.
- **Advocate for better infrastructure:** Share support for local initiatives that enhance public transit, bike lanes, and walkability.
- **Work flexibly:** Adjust your hours to avoid peak traffic, carpool, or telecommute when possible.
- **Plan efficient trips:** Combine multiple errands into single outings to reduce total miles driven.
- **Join or start a carpool:** Share rides with neighbors or colleagues heading in the same direction.

STRATEGY TR-2

Increase Zero-Emission Vehicle Adoption

Reduction Potential

By 2030: 49,607 $MTCO_2e$
By 2045: 110,886 $MTCO_2e$

Key Performance Indicators

By 2030:

- 25% of cars on the road are EVs and plug-in hybrid EVs.
- Increase commercial EVs by 65%.

By 2045:

- 87% of cars on the road are EVs and plug-in hybrid EVs.
- Increase commercial EVs by 90%.

Co-Benefits

AIR POLLUTION | COMMUNITY RESILIENCE | EQUITY | HEALTH AND WELLBEING

Strategy Summary

Increasing the adoption of zero-emission vehicles (ZEVs) is key for reducing emissions and improving air quality in Elk Grove. This strategy focuses on expanding EV charging infrastructure, fostering partnerships with utility providers, and implementing policies to support ZEV adoption across all vehicle types. By making ZEV infrastructure and vehicles more accessible across all income levels and convenient for residents and businesses, the City aims to accelerate the transition to cleaner transportation to help reduce GHG emissions.

Implementing Actions

Action TR-2.1: Adopt an ordinance requiring higher EV charging infrastructure for new commercial development.

Action TR-2.2: Conduct a citywide study to identify optimal locations for public and multifamily residential EV charging stations based on traffic patterns, proximity to major destinations, equity, and existing electrical infrastructure.

Action TR-2.3: Formalize a partnership with SMUD to collaborate on EV infrastructure planning, defining shared goals, responsibilities, and a framework for coordinating EV infrastructure planning, rate structures, incentive programs, and educational initiatives.

Action TR-2.4: Require new publicly accessible (non-card-lock) fueling stations to include one DC fast charger (DCFC) for each two fuel dispenser positions, with a minimum of one half of the required DCFC chargers to be

installed and the remainder of the spaces to be EV Capable. This requirement may also satisfy the EV requirements for any on-site convenience store.

Action TR-2.5: Partner with SMUD to promote ZEVs and provide information on available incentives.

Electric Vehicle Myths

Switching to an EV is an effective way to reduce greenhouse gas emissions—but misinformation can hold people back. Let's clear up a few common misconceptions:

Myth #1: EVs are worse for the climate than gasoline cars because of power plant emissions.
Fact: Even accounting for electricity generation, EVs produce significantly fewer emissions over their lifetime—especially when powered by clean energy.

Myth #2: EVs are worse for the climate than gasoline cars because of battery manufacturing.
Fact: While battery production has an upfront impact, EVs quickly offset this by avoiding tailpipe emissions. Most EVs break even in emissions within 1–2 years of use.

Myth #3: EV batteries are unreliable and need to be replaced every few years.
Fact: Modern EV batteries are designed to last well over 100,000 miles—often the full lifetime of the vehicle.

Myth #4: EV adoption will collapse the U.S. power grid.
Fact: Utilities across the U.S. are preparing for EV growth through smart charging and infrastructure upgrades to manage demand.

Myth #5: There's nowhere to charge an EV.
Fact: Public charging stations are expanding rapidly—and most EV owners charge at home, overnight.

Myth #6: EVs don't have enough range for daily driving.
Fact: Today's EVs typically offer over 200 miles of range—more than enough for the average driver's daily needs.

Myth #7: EVs aren't as safe as gasoline vehicles.
Fact: EVs meet all federal safety standards, and many models earn top safety ratings from regulators and independent organizations.

Click the link to learn more: Electric Vehicle Myths | US EPA

STRATEGY TR-3

Reduce Off-Road Transportation Emissions

Reduction Potential

By 2030: 9,542 $MTCO_2e$
By 2045: 10,856 $MTCO_2e$

Key Performance Indicators

By 2030:

- 100% of diesel-powered construction equipment uses renewable diesel.
- 5% of gas-powered landscaping equipment is replaced with zero-emission alternatives every year.

Co-Benefits

AIR POLLUTION

HEALTH AND WELLBEING

Strategy Summary

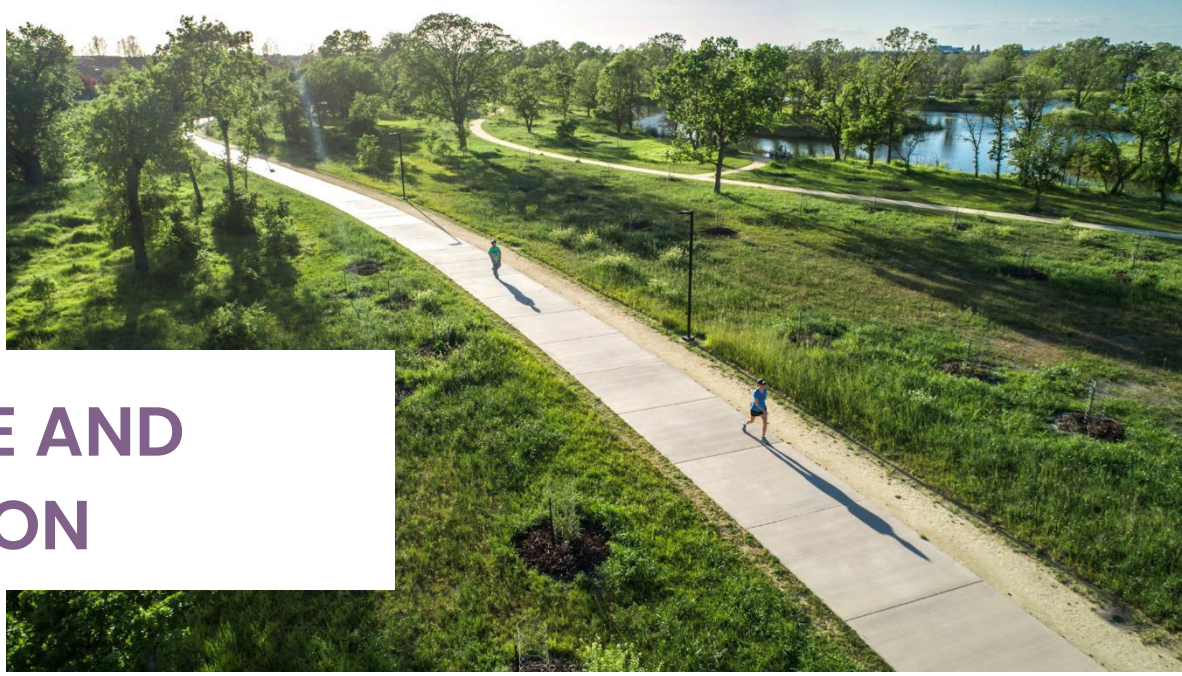
Off-road transportation emissions come from construction equipment, generators, and landscaping machinery, which can negatively impact local air quality and community health and generate emissions. By prioritizing the transition of these off-road sources to cleaner alternatives, the City can reduce emissions, improve air quality, and encourage the adoption of innovative, sustainable technologies across various sectors.

Implementing Actions

Action TR-3.1: Require all construction projects starting in 2026 and later to use renewable diesel in diesel-powered construction equipment.

Action TR-3.2: Prohibit the use of fossil-fuel-powered generators at construction sites in all discretionary projects.

Action TR-3.3: Provide vouchers to business owners (e.g., landscaping businesses) to convert or replace their gasoline-powered gardening equipment, such as lawnmowers, leaf blowers, and hedge trimmers, with electric or other zero-emission alternative equipment. Work with waste collectors and SMAQMD to ensure proper disposal and/or reuse of gasoline-powered landscaping equipment.



RESILIENCE AND ADAPTATION

Climate change is already affecting Elk Grove through extreme heat, intense wildfire smoke, shifting flood patterns, and prolonged drought. While other sections of the *Climate Compass* focus on reducing GHG emissions, this section recognizes that some climate impacts are unavoidable and require proactive adaptation.

Resilience and adaptation strategies are not directly reflected in Elk Grove's GHG emissions inventory and forecast, but they offer benefits that strengthen community wellbeing.

Building resilience means enhancing Elk Grove's ability to prepare for, respond to, and recover from climate hazards, particularly for vulnerable populations who face disproportionate impacts. The resilience strategies here include actions like improving emergency response systems, strengthening infrastructure, and implementing natural solutions such as expanding urban forests and green stormwater management. These strategies address immediate risks while building long-term capacity to withstand climate challenges. By prioritizing adaptation now, Elk Grove can avoid costly damages and future disruptions, improving quality of life and protecting infrastructure, community health, economic stability, and natural systems across the city.

Sector Statistics:

- **30% tree canopy** coverage over the community's streets and sidewalks
- **15 extreme heat days** projected annually by 2035, up from 4 historically
- **24% increase** in annual precipitation by 2070–2099

STRATEGY RA-1

Improve Climate and Emergency Preparedness

Reduction Potential

Not Quantified

Objectives

- Strengthen post-disaster recovery and reconstruction planning.
- Support vulnerable populations through inclusive outreach.

Co-Benefits

Strategy Summary

Climate change poses significant challenges that can disrupt daily life, requiring a comprehensive approach to emergency preparedness to help communities navigate climate hazards safely. Proactive measures are essential to support residents before and after a climate-related emergency. This effort focuses on building awareness of climate hazard readiness across languages and communities while strengthening recovery efforts if needed.

Implementing Actions

Action RA-1.1: Adopt an ordinance for post-disaster recovery and reconstruction that includes provisions for debris clearance, damage assessment, demolitions, re-occupancy and building moratorium criteria, fee waivers and deferrals, for repair and reconstruction.

Action RA-1.2: Utilize the "Sacramento Ready" website as a local climate resilience toolkit, partnering with Sacramento Office of Emergency Services, local businesses, and CBOs to distribute informational materials (pertaining to climate and emergency preparedness) to residents, which would be available in multiple languages and include specific considerations for those who may be more vulnerable (e.g., children, individuals with access and functional needs), along with keeping one's home or business safe.

STRATEGY RA-2

Build Capacity for Current and Future Flooding

Reduction Potential

Not Quantified

Objectives

- Strengthen flood protection through sustainable design.
- Ensure future development supports long-term flood resilience.

Co-Benefits

COMMUNITY RESILIENCE | EQUITY | HEALTH AND WELLBEING | INFRASTRUCTURE RELIABILITY

Elk Grove Rain Garden Plaza

Elk Grove's rain garden captures rainwater, filters pollutants, and reduces flooding, all while showcasing native plants. This sustainable solution turns stormwater into a resource and demonstrates how nature-based approaches build climate resilience.

Learn more about the rain garden!

Strategy Summary

As climate change intensifies precipitation patterns and extreme weather events, Elk Grove faces increased flooding risks that threaten infrastructure, property, and public safety. Building capacity to respond to flooding requires a comprehensive approach that integrates infrastructure improvements, strategic planning, and floodproofing measures. These efforts strengthen Elk Grove's ability to adapt to more frequent and severe flooding, protecting public safety and preserving essential services.

Implementing Actions

Action RA-2.1: Coordinate with Cosumnes Community Services District (CCSD) to identify potential locations for future large-scale, low-maintenance rain or pollinator gardens within the city (emulating the Elk Grove Rain Garden Plaza across from Colton Park), which can provide a range of benefits, such as reduced flooding, improved water quality, improved aesthetics, and being utilized as wildlife habitat.

Action RA-2.2: Continue to implement and work with developers to update as needed, the Storm Drainage Master Plan and ensure that candidate watershed projects and future development proposals associated with the City's storm drainage and flood control collection system are consistent with the City objectives.

STRATEGY RA-3

Protect Populations from Wildfire Smoke

Reduction Potential

Not Quantified

Objectives

- Prepare communities for wildfire smoke events.
- Improve access to clean air information and protection resources.

Co-Benefits

AIR POLLUTION | COMMUNITY RESILIENCE | EQUITY | HEALTH AND WELLBEING

Stay Informed, Stay Safe

California Smoke Spotter

Sign up for mobile apps like Smoke Spotter and AirNow to get real-time updates on air quality, wildfire smoke, and public health alerts in your area. These tools help you make safer choices when air quality is poor or wildfire risks are high.

Download Smoke Spotter

Strategy Summary

While Elk Grove is not at high risk of direct wildfire impacts, it is increasingly susceptible to the far-reaching effects of smoke from distant wildfires. As climate change intensifies wildfire season (and extends the season over a greater period of the year) across California, protecting residents from the harmful impacts of wildfire smoke is critical. Efforts focus on coordinating with regional partners to raise public awareness, improving access to air quality information, and providing practical solutions for air filtration and respiratory protection during smoke events.

Implementing Actions

Action RA-3.1: Coordinate with SMAQMD and other local and regional agencies and organizations to develop a strategy for the widespread awareness and adoption of mobile applications (e.g., Smoke Spotter, AirNow), which can help populations prepare for wildfire smoke events.

Action RA-3.2: In partnership with Sacramento County Public Health and SMAQMD, develop a policy with established criteria and procedures to distribute N95 masks during or in anticipation of wildfire smoke events or prolonged periods of poor air quality.

STRATEGY RA-4

Reduce Exposure to Extreme Heat and Mitigate the Urban Heat Island Effect

Reduction Potential

Included in RA-5

Objectives

- 1% of existing residential units install radiant barriers or cool roofs when re-roofing by 2030, continuing through 2045.
- Increase heat protection in public spaces.

Co-Benefits

Strategy Summary

Extreme heat poses significant risks to public health and infrastructure in Elk Grove. This risk is amplified by the urban heat island effect — a phenomenon where cities become hotter than surrounding rural areas. Urban areas tend to have more heat-absorbing surfaces, such as asphalt and concrete, and less vegetation to provide cooling shade and promote evaporation. As a result, urban areas can experience higher temperatures than nearby rural regions, especially during heatwaves.

Vulnerable populations, including seniors, individuals with pre-existing health conditions, and residents of underserved communities, are disproportionately affected, facing an increased risk of heat-related illnesses and exacerbation of existing health issues. Addressing this issue requires comprehensive actions that reduce heat exposure, enhance cooling infrastructure, and prioritize the needs of Elk Grove's most vulnerable residents during extreme heat events.

Implementing Actions

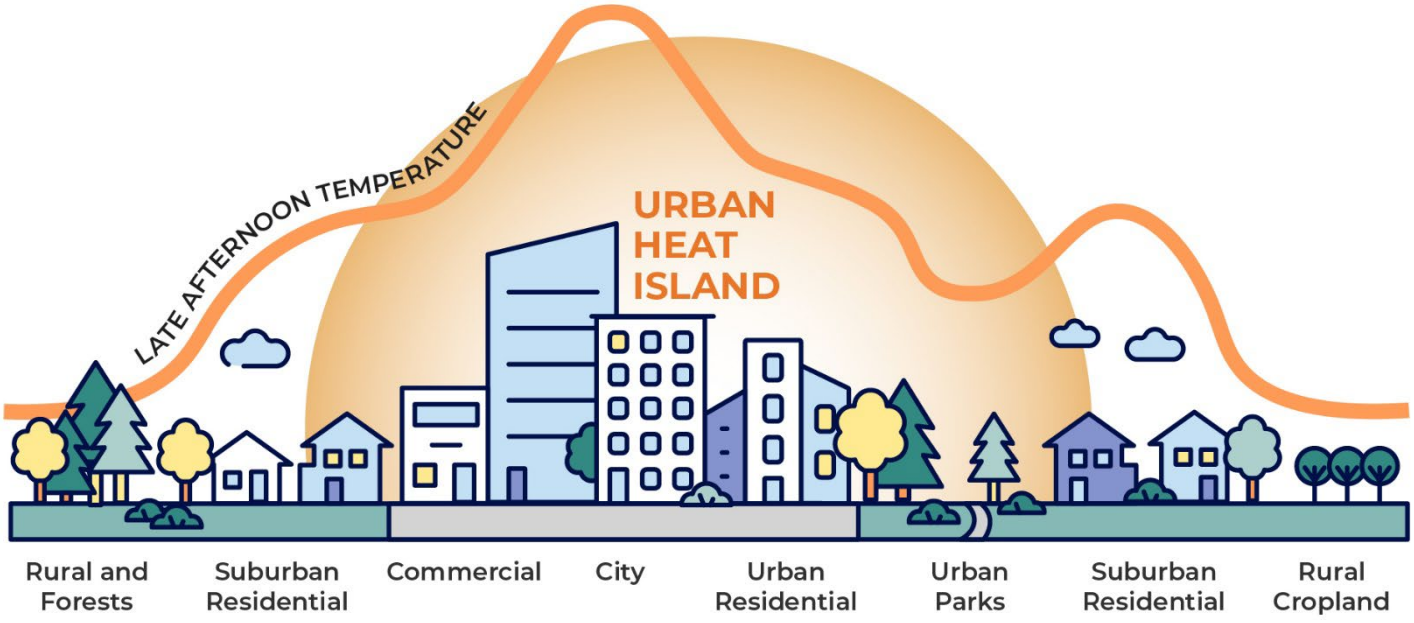
Action RA-4.1: Evaluate and consider establishing requirements for the use of heat mitigation measures in the public realm, particularly in common community gathering spaces (e.g., playgrounds, parks). Requirements may include the incorporation of: (1) building design features (e.g., varied building heights; setbacks from sidewalks; vertical and horizontal shade features); (2) cooling materials, treatments, and coatings (e.g., for rooftops); (3) multiple layers of shading to maximize coverage throughout the day; and (4) street trees and landscaping.

Action RA-4.2: Develop and implement a cool pavement "roadmap" to expand the use of cool pavement across the city. The roadmap will identify pilot locations, potential funding sources, and performance-tracking mechanisms.

Action RA-4.3: Establish a program to assist and incentivize residential and nonresidential building owners in retrofitting existing buildings with cool roofs or green roofs, underscoring the array of co-benefits they have to offer aside from mitigating the urban heat island effect, such as reduced energy costs. As part of the program, consider developing guidelines and linking to an array of external resources for proper maintenance and responsible disposal.

Action RA-4.4: Partner with SacRT to study the feasibility of designing and installing bus shelters that offer protection and relief from heat, considering an array of measures and features.

Action RA-4.5: Seek funding to further implement heat-mitigating public amenities, such as drinking fountains, water mister/spray areas, and shade structures in parks and other community gathering areas throughout the city, in collaboration with CCSD, EGUSD, and other appropriate partners.



What is the Urban Heat Island Effect?

Urban areas tend to experience higher temperatures than surrounding rural regions due to the prevalence of heat-absorbing surfaces, reduced vegetation, and waste heat from human activities. In Elk Grove, these conditions can amplify health risks for vulnerable residents and place additional strain on energy systems during warmer months.

STRATEGY RA-5

Expand the Urban Tree Canopy

Reduction Potential

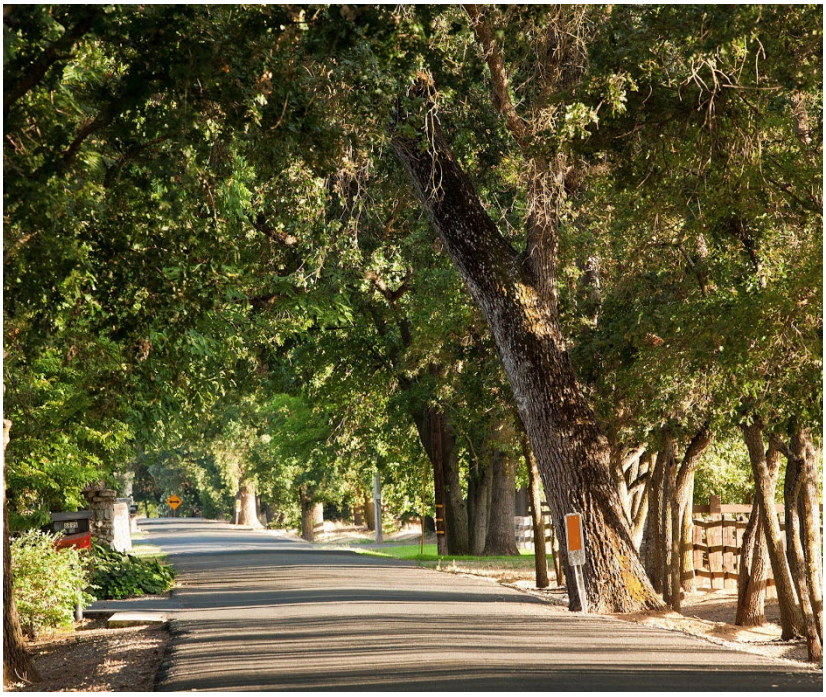
By 2030: 185 $MTCO_2e$
By 2045: 880 $MTCO_2e$

Key Performance Indicator

By 2030:

- 953 trees are planted annually by 2030 through 2045.

Co-Benefits



Strategy Summary

Rising temperatures and worsening air quality highlight the importance of a robust tree canopy. Trees offer natural cooling; improve air quality, capture carbon, manage stormwater; and create healthier outdoor environments. Expanding tree cover—especially in underserved neighborhoods with limited existing canopy—is one of the most cost-effective ways to support both climate resilience and community health.

Implementing Actions

Action RA-5.1: Adopt an ordinance to require new development to plant an appropriate number of trees on site to provide a 50 percent canopy cover over parking surfaces and a 20 percent canopy cover over the remainder of the site. Exemptions to the ordinance may be provided in cases where tree canopy may conflict with solar photovoltaic system siting on the development site, LID features, when conflicting with the Solar Shade Control Act, or on a case-by-case basis for industrial locations.

Action RA-5.2: Develop and adopt an Urban Forest Master Plan to sustainably manage and increase tree canopy across the city, which includes or identifies: (1) potential new tree planting sites with a priority emphasis on areas with low canopy coverage (i.e., under 15 percent); (2) native tree species and design guidelines; and (3) best practices in watering and maintenance practices, along with street and park tree preservation.

Action RA-5.3: In coordination with the Sacramento Tree Foundation (STF), develop and annually update a work plan to identify and budget for specific tree planting and maintenance projects for implementation each year consistent with the goals and targets of the Citywide Urban Forest Master Plan.

Action RA-5.4: Consider updates to the Tree Preservation and Protection Regulations to improve effectiveness and ensure enhancement of tree canopy.

Action RA-5.5: Continue to partner with STF to strengthen the city's public and private tree canopy through the increased usage and/or expansion of existing programs, such as "Sacramento Shade," which currently offers a free landscape assessment and up to 10 free shade trees for SMUD customers (e.g., homeowners, renters, and businesses), among other programs.

Source: The Nature Conservancy 2025.

STRATEGY RA-6

Expand Nature-Based Solutions

Reduction Potential

Included in RA-5

Objectives

- Promote environmental awareness.
- Expand parks and green spaces.
- Promote sustainable land management in rural areas.

Co-Benefits

Strategy Summary

Nature-based solutions are sustainable approaches that use or mimic natural systems to provide environmental, social, and economic benefits while building resilience to climate change impacts. This strategy will integrate these solutions throughout Elk Grove in both urban areas and rural landscapes to foster a more sustainable and livable environment. Actions range from urban greening initiatives to sustainable rural land management, collectively strengthening Elk Grove's climate resilience and ecological health.

Implementing Actions

Action RA-6.1: Encourage EGUSD to identify opportunities for schoolyard and campus greening projects. Enhance integration of schoolyard greening efforts with environmental education curricula to foster environmental awareness and engagement among students.

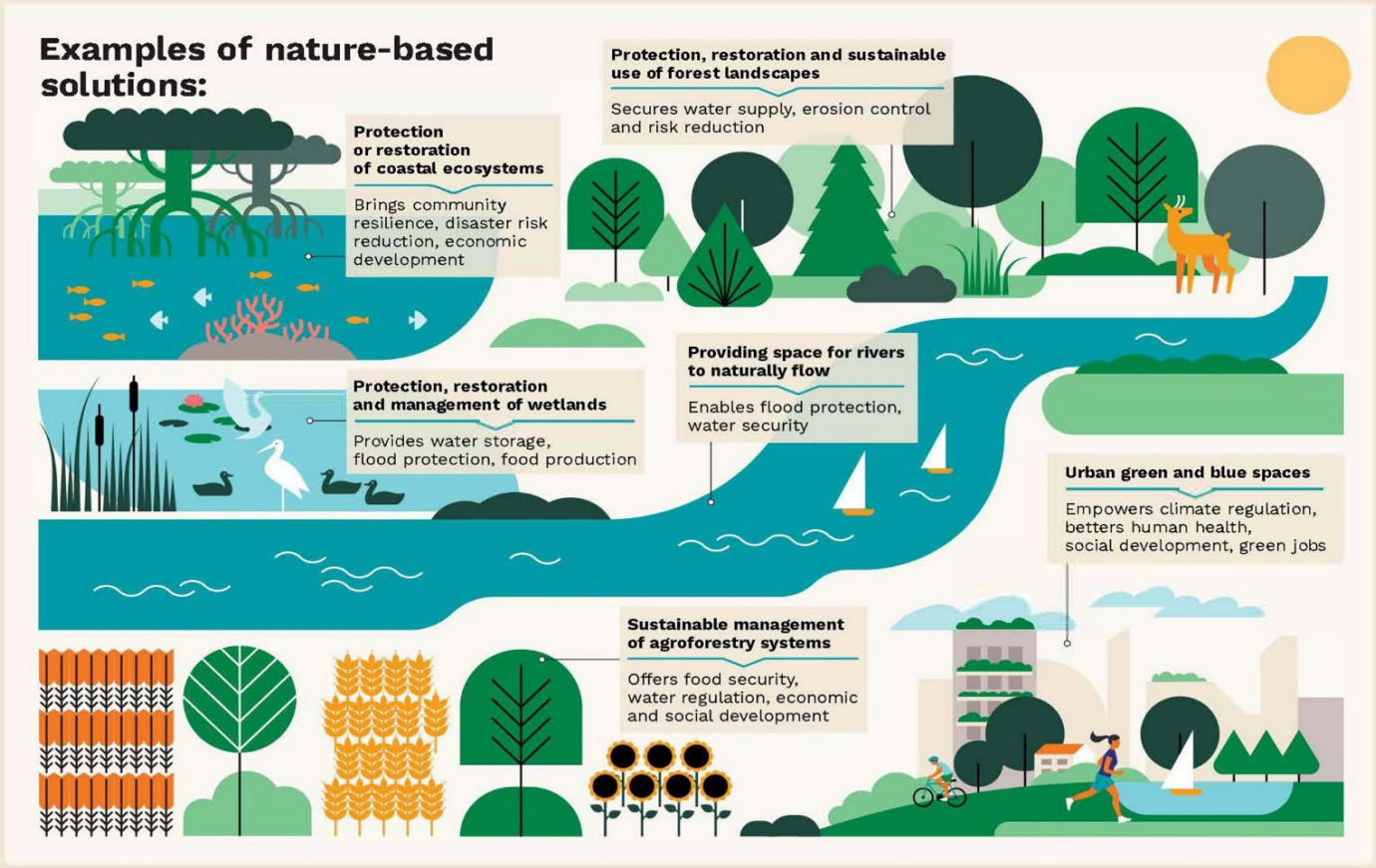
Action RA-6.2: Investigate opportunities to establish new parks, greenways, and trail networks to connect existing green spaces and ensure all residents have access to nature.

Action RA-6.3: Explore incentivizing climate smart land management in the rural area of the city.

Action RA-6.4: Evaluate rural lands for current and historical carbon storage (including mapping and modeling), the potential for future carbon sequestration with restoration, avoided conversion, or management, and the stability of the stored carbon and risk of carbon loss due to climate change or land use change.

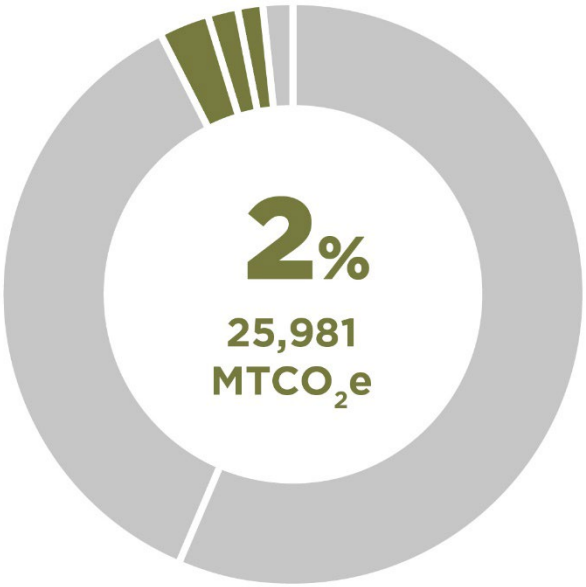
What do nature-based solutions look like?

Nature-based solutions harness natural processes to address local challenges in a sustainable and effective way. Investing in natural systems—rather than relying solely on engineered approaches—can lead to cost-effective strategies that support both community well-being and environmental health. Above are some examples of nature-based solutions and the benefits they offer!



Source: IUCN 2024.

RESOURCE CONSUMPTION



Total Emissions from Wastewater Treatment, Water Supply, and Solid Waste Sectors in 2021

Resource consumption in Elk Grove focuses on how materials and natural resources are used, managed, and ultimately discarded or reused. While this sector accounts for a relatively small portion of the city's GHG emissions—2 percent from solid waste and less than 1 percent from water use—it offers significant opportunities for climate action and adaptation efforts that also provide community benefits and extend beyond emissions reduction.

Sustainable resource management is essential to building a resilient community. By rethinking how materials flow through our economy and daily lives, Elk Grove can reduce environmental impacts while creating value from what was previously considered waste. California's SB 1383 is a critical mandate in this effort, requiring jurisdictions to reduce organic waste disposal by 75 percent and recover 20 percent of edible food for human consumption by 2025. This regulation drives many of Elk Grove's waste diversion strategies while also supporting the transition to more circular systems, where materials maintain their highest utility through repeated use cycles.

Implementing more efficient resource management strategies yields tangible benefits for Elk Grove residents. Increased organic waste diversion creates nutrient-rich compost that enhances local soil health and reduces the need for synthetic fertilizers. Water conservation measures also help households save on utility bills while building community resilience against drought conditions. By focusing on resource consumption, Elk Grove creates pathways for residents to directly engage in climate action while experiencing immediate quality-of-life improvements in their communities.

Sector Statistics:

- **40%** of residential and **39%** of commercial waste was diverted in 2021.
- Food waste accounted for approximately **18%** of total landfill disposal.
- Recycled water was used to irrigate **118** acres of parks, streetscapes, and trails.

STRATEGY RC-1

Increase Organic Waste Diversion

Reduction Potential

By 2030: 4,755 $MTCO_2e$
By 2045: 28,775 $MTCO_2e$

Key Performance Indicators

By 2030:

- Divert 80% of waste from landfills.

By 2045:

- Divert 95% of waste from landfills.

Co-Benefits

Strategy Summary

Organic waste, including food scraps and yard trimmings, produces methane—a potent GHG—when decomposing in anaerobic conditions found in landfills. To address this environmental challenge and align with SB 1383, which mandates reductions in organic waste disposal, Elk Grove is intensifying efforts to divert organic waste from landfills. This strategy focuses on collaborating with regional partners to build capacity for an edible food recovery program and increase participation in the City's organic recycling program through targeted education and incentives.

Implementing Actions

Action RC-1.1: Expand the City's existing organic recycling program for multifamily complexes, schools, and commercial businesses, by increasing access to centralized organic waste dumpsters and providing resources for implementing and/or improving source separation of food waste.

Action RC-1.2: Develop an edible food recovery program that encourages food generators (e.g., grocery stores, restaurants, and food service distributors) to execute private agreements with qualified food recovery organizations.

Action RC-1.3: Encourage residents and businesses to actively participate in the City's food waste recycling program through increased education and outreach.

STRATEGY RC-2

Promote a Circular Economy

Reduction Potential

Included in RC-1

Objectives

- Increase waste diversion.
- Encourage reuse, repurpose, and sharing of goods.
- Assess waste streams and resource flows.

Co-Benefits

Strategy Summary

A circular economy seeks to eliminate waste and maximize resource use by keeping materials in circulation through reuse, repair, and recycling. Elk Grove is committed to advancing toward a circular economy by understanding existing waste streams, implementing demonstration projects, and engaging in regional collaboration. These efforts will enable the City to identify opportunities to raise awareness and develop a more comprehensive framework for sustainable resource management.

Implementing Actions

Action RC-2.1: Use the Sacramento County waste characterization study to provide information on actionable recommendations for waste reduction and diversion by residents and businesses in Elk Grove.

Action RC-2.2: Advance opportunities for reusing, repurposing, and sharing durable goods through partnering with the Sacramento Public Library to expand the Library of Things Program, providing information to residents and businesses related to relevant online platforms (e.g., Buy Nothing, TooGoodToGo, Olio, Vinted) and increasing public awareness of the Reuse Room at the SWCC.

Action RC-2.3: Continue to incentivize residents to reduce the amount of waste they generate and send to landfills through waste collection fee adjustments that increase fees for solid waste containers and do not charge fees for additional recycling and organic waste containers that are included in garbage service.

Action RC-2.4: Perform a Circular Economy Baseline Assessment of the City's existing waste streams, resource flows, and economic activities to identify opportunities for infrastructure, projects, and materials to be maintained as long as possible and identify areas with the highest potential for circularity.

STRATEGY RC-3

Reduce Water Use

Reduction Potential

By 2030: 140 $MTCO_2e$
By 2045: 0 $MTCO_2e$

Key Performance Indicators

By 2030:

- Reduce water consumption by 5%.

By 2045:

- Reduce water consumption by 20%.

Co-Benefits

COMMUNITY RESILIENCE

EQUITY

RESOURCE PRESERVATION

Strategy Summary

Elk Grove has faced changing precipitation patterns, including extended droughts, underscoring the importance for water conservation. Reducing water use includes a comprehensive approach that promotes water-efficient landscaping, expands recycled water infrastructure, and enforces stringent water efficiency standards for new developments. It involves working with local water districts and regional partners to enhance conservation efforts, update relevant ordinances, and educate the community on best practices. These efforts will build resilience against future water scarcity and foster a culture of responsible water use among residents and businesses.

Implementing Actions

Action RC-3.1: Expand the use of recycled water in Elk Grove by extending services into areas planned for service and explore expansion as part of new development areas.

Action RC-3.2: Continue collaborating with Elk Grove Water District, Sacramento County Water Agency, and other water providers to participate in regional water-saving initiatives, encourage voluntary water conservation measures, and share best practices for water conservation strategies.

Action RC-3.3: Mandate water efficiency standards for new construction that require water-neutral development for projects expected to exceed the historical water use of a parcel.

Action RC-3.4: Regularly review and update the Water Efficient Landscape Ordinance to comply with evolving State laws.

GREEN ECONOMY

Transitioning to a green economy enables Elk Grove to address climate challenges while simultaneously fostering economic growth. Although green economy strategies may not directly reduce GHG emissions, they are essential for building the foundation that enables and accelerates climate action across all sectors.

Green Economy strategies are not directly reflected in Elk Grove's GHG emissions inventory and forecast, but they offer benefits that strengthen community wellbeing and economic resilience.

Supporting green businesses will enable Elk Grove to attract innovative companies, create quality local jobs, and develop a workforce skilled in sustainable practices. This approach recognizes that as California continues its transition away from fossil fuels, communities that proactively invest in green industries will be better positioned for long-term economic resilience. A green economy removes barriers to sustainable business development, connects local businesses with resources and recognition programs, and ensures that economic opportunities in emerging green sectors are accessible to all residents.

Incorporating economic development into climate planning demonstrates that environmental sustainability and economic vitality can work hand in hand, creating a community where businesses thrive while contributing to climate solutions.

STRATEGY GE-1

Support Green Businesses

Reduction Potential

Not Quantified

Objectives

- Attract and retain sustainable industries.
- Connect businesses to resources and green job training.

Co-Benefits

ECONOMIC DIVERSITY

EQUITY

Strategy Summary

Promoting a green economy focuses on supporting the development of sustainable businesses and the transition to a low-carbon economy. As Elk Grove grows and fossil fuels are gradually phased out due to scarcity, new regulations, or other factors, the City has an opportunity to lead and innovate in clean businesses and technologies. This includes providing training opportunities and developing strategic plans to foster sustainable economic growth.

Implementing Actions

Action GE-1.1: Prioritize the retention, expansion, and attraction of green industry businesses and businesses utilizing sustainable practices resulting in an innovative, low-carbon economy.

Action GE-1.2: Create programs, policies, and incentives that increase retention, expansion, and attraction of green industry and sustainable businesses.

Action GE-1.3: Connect businesses with organizations that recognize sustainability efforts and provide resources like environmental updates, incentives, and educational tools.

Action GE-1.4: Support green industry and sustainable businesses in meeting their hiring needs while prioritizing the training and employment of Elk Grove residents in green jobs.

CLIMATE ACTION COMMITMENT

While other sections focus on technical solutions and policy frameworks, this section emphasizes that meaningful climate action ultimately relies on community awareness, engagement, and consistent tracking. Through thoughtfully designed, accessible outreach, education, and KPIs, the City aims to embed sustainable choices into everyday life. These efforts foster a deeper understanding of climate challenges and solutions, open pathways for meaningful participation, and ensure climate initiatives remain responsive to community needs and priorities. This includes building and maintaining trusted channels for information sharing and feedback, as well as making sustainable choices that are both accessible and appealing across Elk Grove's diverse communities.

This commitment affirms that technical and policy solutions alone are not enough to confront climate change. Long-term progress requires cultural shifts, a sense of shared responsibility, and sustained engagement. By investing in these foundational elements, the City is laying the groundwork for lasting climate resilience while strengthening community bonds and enhancing the quality of life.

STRATEGY CA-1

Conduct Meaningful Community Outreach

Reduction Potential

Not Quantified

Objectives

- Empower residents through outreach, education, and volunteer programs.

Co-Benefits

COMMUNITY RESILIENCE

EQUITY

HEALTH AND WELLBEING

Strategy Summary

Engaging residents (both owners and renters), businesses, and local organizations is essential for advancing climate action and adaptation goals. Fostering a well-informed and empowered community will help create a collaborative environment that prioritizes inclusive outreach, ensuring climate action is built from the ground up. This approach opens pathways for Elk Grove's diverse communities to contribute to and benefit from efforts to build a more sustainable, climate-resilient future.

Implementing Actions

Action CA-1.1: Implement the Climate Ambassador Program as a permanent program, which recruits and trains volunteers to serve as local sustainability champions and educators.

Action CA-1.2: Develop a neighborhood resilience committee program to increase connectedness among the community and provide support during climate hazard events.

Action CA-1.3: Partner with SMUD to establish a comprehensive community outreach and education campaign to raise awareness about the benefits of building electrification, available incentives and programs, and the importance of decarbonizing the building sector.

Action CA-1.4: Partner with SMUD to promote its Residential, Neighborhood, and Commercial SolarShares programs, which allow residential customers, commercial customers, and developers to purchase renewably sourced electricity without having a solar system onsite.

Action CA-1.5: Work with regional partner agencies and utilities, such as SMAQMD and SMUD, to promote rebates and incentives for installing both residential and nonresidential renewable energy (e.g., solar) and battery storage systems.

STRATEGY CA-2

Provide Community Education on Public Health and Wellbeing

Reduction Potential

Not Quantified

Objectives

- Enhance community education on public health and wellbeing.

Co-Benefits

AIR POLLUTION | COMMUNITY RESILIENCE | EQUITY | HEALTH AND WELLBEING

Strategy Summary

Promoting public health and wellbeing is a key pillar of the City's climate action efforts. By reducing emissions from buildings, landscapes, and everyday activities, Elk Grove can create healthier, more resilient communities. Efforts to amplify sustainable adoption include highlighting the benefits of decarbonization and offering clear pathways for residents (both owners and renters) and businesses to implement them in their own lives. Educational initiatives will empower the community to make sustainable choices while demonstrating how improvements in energy use, waste reduction, and cleaner environments can enhance overall quality of life across Elk Grove.

Implementing Actions

Action CA-2.1: Develop an educational campaign to raise awareness about the benefits of electric landscaping equipment.

Action CA-2.2: Develop informational materials to provide information to residents and businesses to support the city's tree canopy.

Action CA-2.3: Partner with CBOs, such as the Elk Grove Community Garden and Learning Center and the Food Literacy Center, to expand gardening and healthy food education opportunities for individuals and families.

Action CA-2.4: Promote circular economy awareness through educational campaigns and programs to educate residents and businesses about circular principles and encourage them to adopt circular practices and behaviors.

Action CA-2.5: Promote California's Clean Off-Road Equipment Voucher Program for professional landscape services, which provides vouchers to purchase zero-emission landscaping equipment.

STRATEGY CA-3

Provide Community Education on Water Efficiency

Reduction Potential

Not Quantified

Objectives

- Promote innovative water management technologies.
- Increase awareness on water conservation.

Co-Benefits

COMMUNITY RESILIENCE

EQUITY

RESOURCE PRESERVATION

Strategy Summary

Water conservation is essential for Elk Grove's long-term sustainability, especially in the face of recurring droughts and increasing weather variability. This strategy recognizes that an informed community is critical for strengthening water resilience, reducing strain on local resources, and fostering a shared commitment to responsible water use.

Implementing Actions

Action CA-3.1: Promote the use of smart water management technologies (e.g., smart irrigation controllers, leak detection devices, and real-time water monitoring systems) that provide real-time data on water usage and encourage water conservation.

Action CA-3.2: Continue conducting public education and outreach to raise awareness about the significance of water conservation, offer practical tips for reducing water consumption, and emphasize the opportunities accessible to residents for decreasing water usage.

STRATEGY CA-4

Measure and Manage Climate Action Progress

Reduction Potential

Not Quantified

Objectives

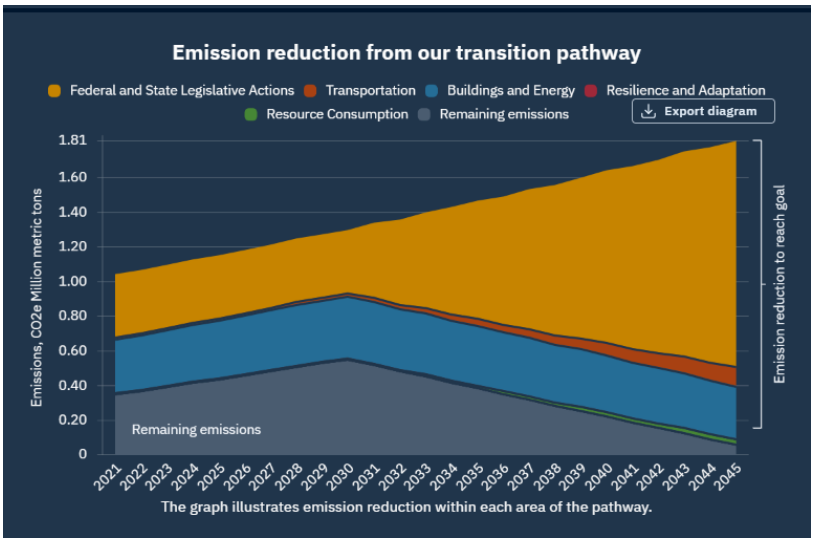
- Produce annual progress reports.
- Publicly share climate action and adaptation data.

Co-Benefits

COMMUNITY RESILIENCE

ECONOMIC DIVERSITY

EQUITY



Strategy Summary

Tracking and sharing progress is a critical step in ensuring the success of the *Climate Compass*, offering insights into strategy effectiveness and highlighting areas for improvement. Reporting mechanisms will monitor GHG reduction and adaptation goals while also creating avenues for sharing information and gathering feedback. By promoting transparency and accountability, the City can remain responsive to evolving needs and foster a shared responsibility for climate action achievements across communities.

Implementing Actions

Action CA-4.1: Prepare and publish an annual report summarizing the City's progress towards its GHG reduction and adaptation goals, using the KPIs and other relevant metrics. Include narratives highlighting key accomplishments, challenges, lessons learned, and case studies of successful projects and initiatives. Present the report to the City Council to inform future climate action and adaptation-related budget and policy decisions.

Action CA-4.2: Regularly update data on progress towards the City's climate action and adaptation goals, including KPIs, in a clear and transparent manner for community members.

Action CA-4.3: Conduct regular surveys, focus groups, and assessments to collect participant feedback and gauge shifts in knowledge, attitudes, and behaviors about sustainability.

Action CA-4.4: Establish a dedicated Climate Action Coordinator position within the City to lead climate, resilience, and sustainability initiatives across the City that include (1) supporting implementation of the *Climate Compass*, (2) collaborating across departments and stakeholders on opportunities to achieve the climate, resilience, and sustainability goals, (3) building partnerships with businesses, community organizations, educational institutions, and residents, and (4) pursuing funding and resource opportunities.

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CHAPTER 4

CITY OPERATIONS

Chapter 4
City Operations

The City recognizes its responsibility to lead by example in addressing climate change and reducing its carbon footprint. This chapter summarizes the GHG inventory, forecasts, and reduction targets for the City of Elk Grove government operations (referred to hereafter as COEG), which refer to the day-to-day activities and functions carried out by local government to manage and maintain public services and city infrastructure. **Chapter 4** also presents the strategies and actions COEG will implement to reduce GHG emissions from its operations.

In addition to acting at the community level, COEG is furthering its commitment to addressing climate change through climate action planning for government operations. Local governments play an essential role in influencing GHG reductions throughout their communities. By reducing contributions to climate change from its operations, COEG is demonstrating its commitment and leading by example. Including government operations in the *Climate Compass* builds on actions already taken by COEG to reduce its GHG emissions, provides an opportunity to strengthen operations, and positively impacts the community COEG serves.

COEG has prepared a GHG emissions inventory, forecasted future emissions, and established reduction targets for COEG operations. These steps set the foundation for developing GHG reduction strategies and actions to reduce emissions across departments and day to day COEG operations.

SPOTLIGHT: Elk Grove's Sustainability Leadership

COEG leads by example through various sustainability initiatives in its operations:

- ***Clean Fleet Program:*** The ongoing transitioning of fleet vehicles to electric.
- ***LED Streetlight Conversion:*** Upgrading all 12,000+ streetlights to energy-efficient LEDs.
- ***Renewable Energy:*** Installing solar panels on eligible COEG buildings.
- ***Water Conservation:*** Implementing water efficiency updates in COEG facilities and other areas.
- ***Waste Reduction:*** Expanding recycling and composting in COEG buildings and facilities.
- ***Green Purchasing:*** Committing to local and environmentally friendly products for COEG operations.
- ***Green Building Practices:*** Building new facilities to CALGreen Tier 1 standards.

4.1 INVENTORY

Like community GHG emissions inventories, standardized guidance has been developed to assist local governments in conducting government operations inventories. This *Climate Compass* uses the most recent guidance, which is ICLEI—Local Governments for Sustainability's May 2010 publication, *Local Government Operations Protocol for the Quantification and Reporting of Emissions Inventories*. Following this guidance, COEG prepared a comprehensive inventory of its operational emissions for the year 2021. This inventory provides a detailed account of GHG emissions resulting from various COEG activities and services, serving as a foundation for climate action.

The 2021 COEG GHG emissions inventory estimates emissions in eight sectors: buildings and facilities, streetlights and traffic signals, employee commute, vehicle fleet, solid waste, water supply, wastewater treatment and process and fugitive emissions. **Table 4-1** describes each GHG emissions sector.

Table 4-1 City of Elk Grove Operations Greenhouse Gas Emissions Inventory Sectors

Sector	Description
Buildings and Facilities	Emissions from electricity, natural gas, and diesel use in COEG-owned buildings, including parks and other facilities.
Streetlights and Traffic Signals	Emissions from electricity used to power streetlights and traffic signals.
Employee Commute	Emissions from fuel used by COEG employees commuting to and from work.
Vehicle Fleet	Emissions from fuel consumption in COEG-owned and operated on-road vehicles and off-road equipment.
Solid Waste	Emissions from the decomposition of COEG operations-generated mixed and organic waste in landfills.
Water Supply	Emissions from electricity used to supply, treat, and distribute water for COEG operations.
Wastewater Treatment	Emissions from treating COEG operations-generated wastewater, including process emissions and energy use.
Process and Fugitive Emissions	Emissions from leakage in the natural gas distribution system.

COEG operations generated 4,275 $MTCO_2e$ in 2021. Buildings and facilities were the largest contributor at 41 percent of emissions, followed by streetlights and traffic signals (21 percent), employee commute (20 percent), and vehicle fleet (14 percent).

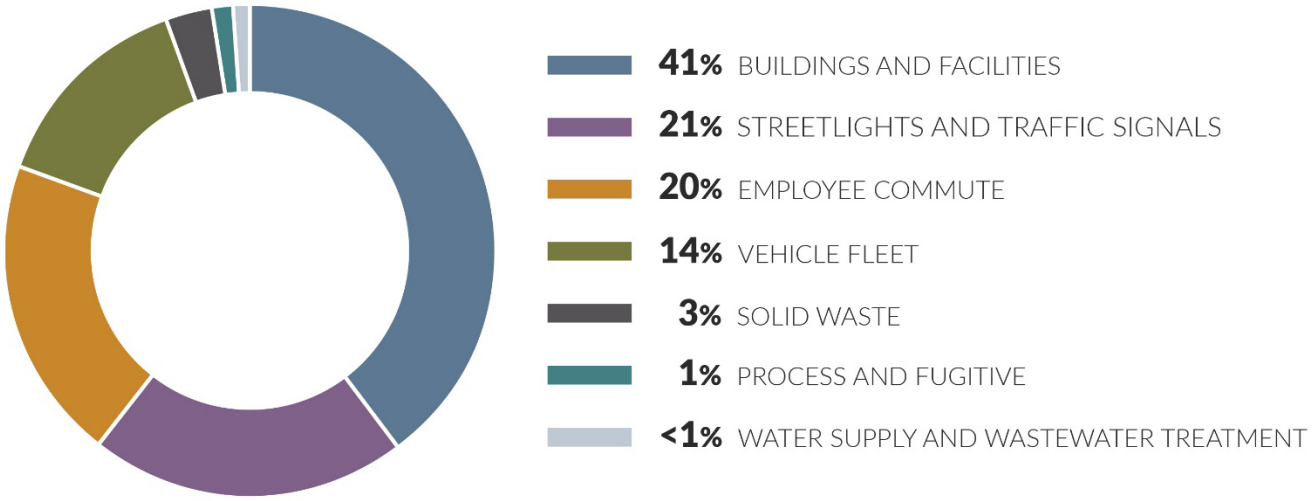
The remaining sources (i.e., solid waste, water supply, wastewater treatment, and process and fugitive emissions) collectively accounted for about 4 percent of total emissions. This breakdown, as shown in **Table 4-2** and **Figure 4-1**, highlights key areas for potential emissions reduction efforts, particularly in energy used for buildings and lighting, as well as transportation-related emissions from employee commutes and COEG's fleet.

Table 4-2 2021 City of Elk Grove Operations GHG Emissions Inventory

Sector	GHG Emissions ($MTCO_2e$)	Percent of Total
Buildings and Facilities	1,741	41%
Streetlights and Traffic Signals	893	21%
Employee Commute	835	20%
Vehicle Fleet	620	14%
Solid Waste	139	3%
Water Supply	9	<1%
Wastewater Treatment	7	<1%
Process and Fugitive Emissions	32	1%
Total	**4,275**	**100%**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Figure 4-1 2021 City of Elk Grove Operations Greenhouse Gas Emissions Inventory



4.2 FORECASTS

COEG prepared BAU and "no local action" forecasts of its operational emissions. Using 2021 GHG emissions levels as the baseline, the forecasts provide emissions estimates for the years 2030 and 2045. The forecasts were developed using similar methodologies described in **Chapter 2** for community forecasts. Details on how the forecasts were developed and the activity data used in each sector can be found in **Appendix D**.

"Business-as-Usual" Forecast

The BAU forecast estimates GHG emissions for all sectors based on predicted growth in COEG employment. These forecasts assume the continuation of current behaviors and activities within COEG operations and that no additional efforts or legislative actions beyond what has already been implemented will be made to reduce GHG emissions in the future. As illustrated in **Table 4-3** below, the BAU forecast emissions are forecasted to rise approximately 72 percent above 2019 levels in 2045.

Table 4-3 City of Elk Grove Operations GHG Emissions Inventory BAU Forecasts ($MTCO_2e$)

Sector	2021	2030	2045
Buildings and Facilities	1,741	2,304	2,987
Streetlights and Traffic Signals	893	1,136	1,532
Employee Commute	835	1,104	1,432
Vehicle Fleet	620	820	1,064
Solid Waste	139	184	239
Water Supply	9	12	16
Wastewater Treatment	7	8	11
Process and Fugitive	32	42	55
Total	**4,275**	**5,611**	**7,334**
BAU Percent Change from 2021 Levels	**N/A**	**+31%**	**+72%**

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

"No Local Action" Scenario

The "no local action" scenario forecasts GHG emissions for COEG operations, accounting for employment growth and legislative actions at the state and federal levels (a summary of the legislative reductions applied can be found in **Chapter 2**, **Table 2-4**). These forecasts help COEG prioritize emissions sectors and sources when developing strategies and actions for GHG reduction.

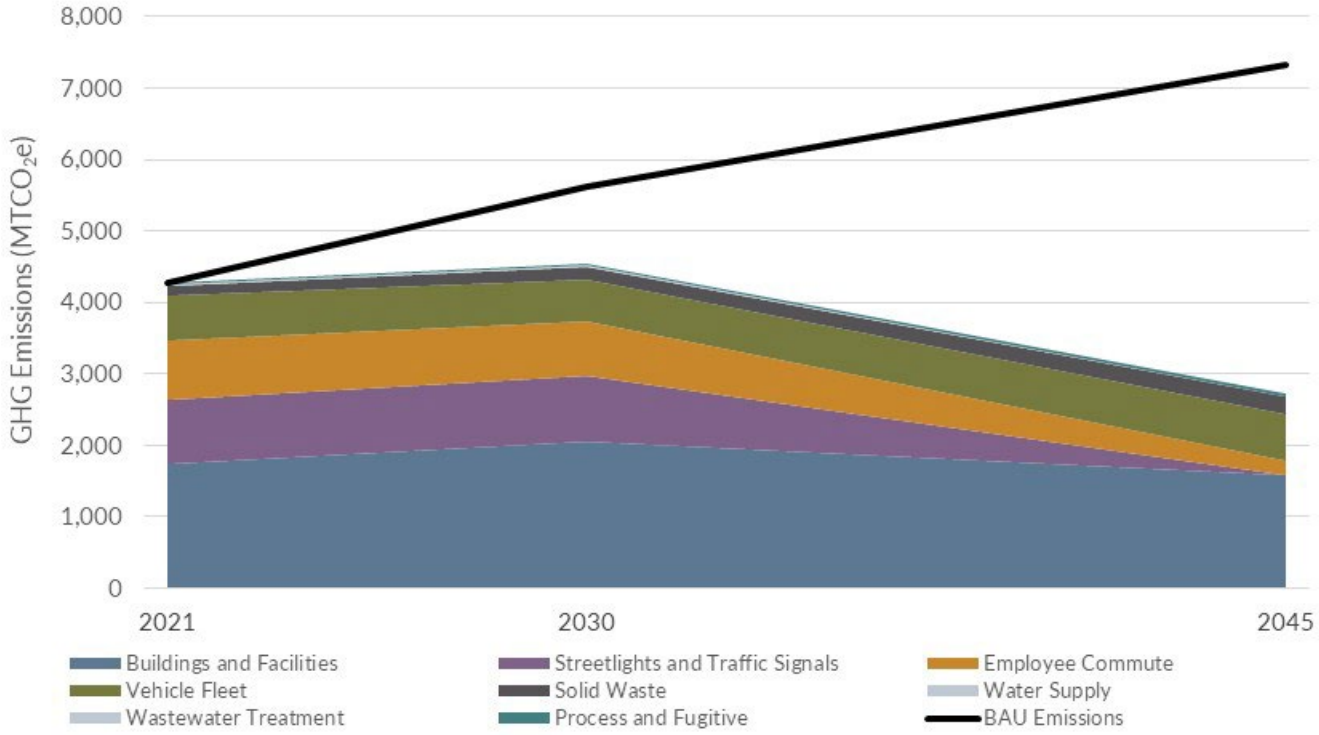
Accounting for legislative actions, GHG emissions from COEG operations are expected to decline, with an increase of 6 percent above 2021 levels by 2030 and a 36 percent decrease by 2045. This trend contrasts sharply with the BAU forecast, which forecasts a significant increase in emissions. These forecasts are presented in **Figure 4-2** and **Table 4-4** below, and **Figure 4-2** also shows the emissions trend that would occur if no action were taken.

Table 4-4 City of Elk Grove Operations "No Local Action" GHG Emissions Forecasts ($MTCO_2e$)

Sector	2021	2030	2045
Buildings and Facilities	1,741	2,054	1,588
Streetlights and Traffic Signals	893	907	0
Employee Commute	835	769	201
Vehicle Fleet	620	578	646
Solid Waste	139	184	239
Water Supply	9	9	0
Wastewater Treatment	7	7	3
Process and Fugitive	32	42	55
Total	**4,275**	**4,550**	**2,732**
No Local Action Percent Change from 2021 Levels	**N/A**	**+6%**	**-36%**

Notes: Total may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Figure 4-2 City of Elk Grove Operations BAU and "No Local Action" GHG Emissions Forecasts



Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

4.3 TARGETS

COEG aims to align its GHG reduction targets for operational emissions with the state's targets, as outlined in **Chapter 2**. Like many local agencies in California, historical emissions data for COEG operations from 1990 are unavailable. Instead, GHG reduction targets for COEG operations were established relative to the COEG's 2021 operations emissions inventory, consistent with CARB guidance. The methodology used to calculate these reduction targets for 2030 and 2045 is consistent with the methodology used to calculate community targets described in **Chapter 2**.

In 2021, COEG operational GHG emissions totaled 4,275 $MTCO_2e$. Therefore, COEG's GHG reduction targets align with State targets as follows:

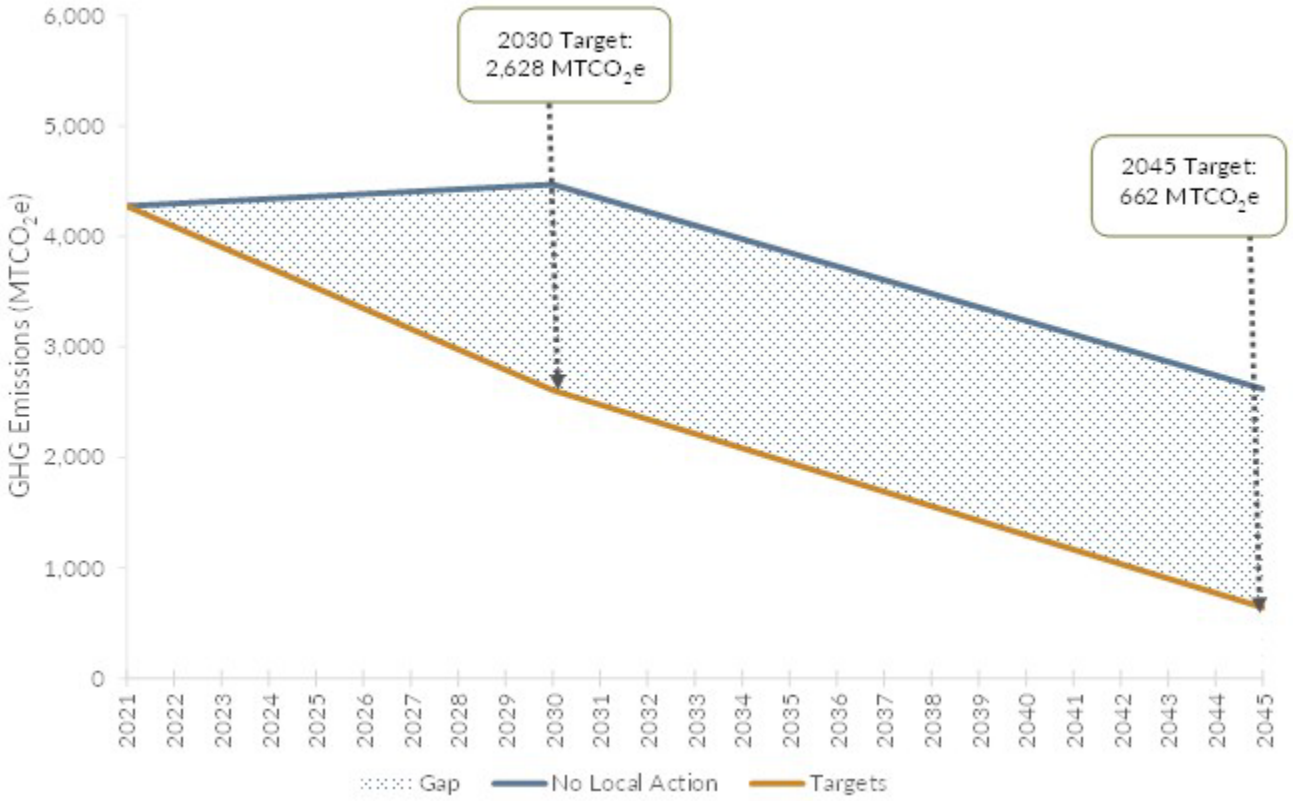
- 2030 target: 39 percent below 2021 levels
- 2045 target: 85 percent below 2021 levels

The targets requires GHG emissions to be reduced from COEG operations to 2,628 $MTCO_2e$ in 2030 and 662 in 2045.

4.4 EMISSIONS GAP

Actions at the State and federal levels will contribute to reducing GHG emissions associated with COEG operations. However, additional local actions beyond State and federal regulations will be necessary to bridge the "local emissions gap" and achieve the GHG reduction targets for COEG operations. Emissions and targets for COEG operations are summarized in **Figure 4-3** below.

Figure 4-3 City of Elk Grove Operations GHG Emissions Gap



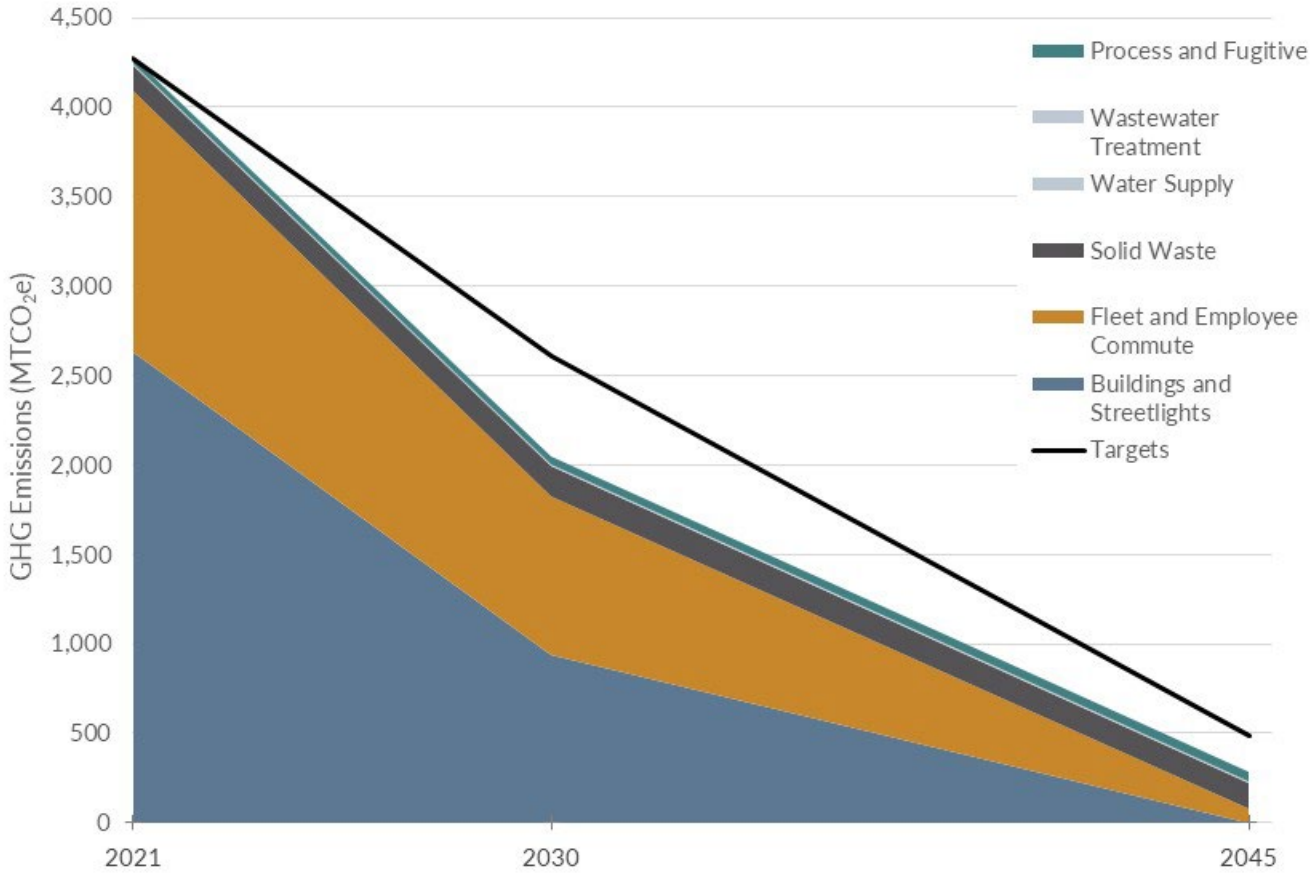
Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

4.5 MUNICIPAL STRATEGIES AND ACTIONS

COEG is committed to embedding sustainability into the core functions of local government. Although municipal operations account for a small portion of citywide GHG emissions, they present a key opportunity to lead by example, drive innovation, and set a standard for the community and region. By upgrading facilities, transitioning the municipal fleet, and improving resource efficiency, COEG can reduce emissions, strengthen resilience, and enhance public services.

The following strategies and actions focus on reducing GHG emissions from COEG-owned buildings, vehicles, and infrastructure, while also improving operational performance and long-term cost-effectiveness. Many will yield co-benefits such as cleaner air, better employee health, and more reliable services. Together, these efforts support broader climate goals and reinforce its leadership in climate action. **Figure 4-4** and **Table 4-5** show the effects of the strategies on COEG emissions and that the suite of strategies provides a pathway for COEG to meet its reduction targets. Additional information on strategy-specific reductions and related quantification for City operations can be found in **Appendix D**.

Figure 4-4 Elk Grove Operations Emissions with Climate Compass Strategies



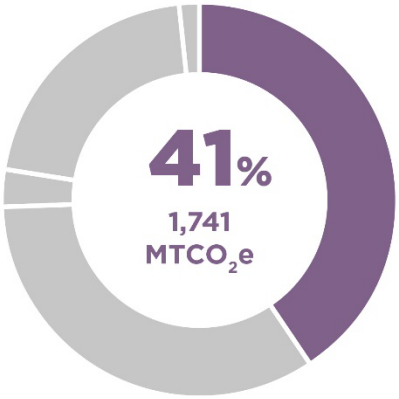
Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Table 4-5 Elk Grove Operations Emissions with Climate Compass Strategies

	2030	2045
Total Reductions from Strategies ($MTCO_2e$)	2,501	2,450
Reduction Needed to Meet Target ($MTCO_2e$)	1,923	2,070
Target Percent Reduction Below 2021 Levels	39%	85%
Target Met?	**Yes**	**Yes**
Remaining Gap to Target ($MTCO_2e$)	-578	-380

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent.

BUILDINGS AND FACILITIES



Total Emissions from Buildings and Facilities Sector in 2021

Municipal buildings and facilities represent the largest source of GHG emissions in COEG's operations, accounting for 41 percent of the operational carbon footprint.

COEG's effort to decarbonize its facilities focuses on three interconnected pathways: electrification, renewable energy integration, and enhanced efficiency. By transforming its building portfolio, COEG can demonstrate the practical implementation of climate solutions while improving operational resilience and reducing long-term energy costs. These improvements extend beyond emissions reductions; they create healthier workspaces for employees, showcase innovative technologies to the community, and strengthen infrastructure against climate impacts.

Early efforts—such as installing LED lighting and smart thermostats—can help lay the groundwork for long-term upgrades like full building electrification and on-site renewable energy. As innovation and emerging technologies continue to evolve and become more cost-effective, they will be incorporated to help ensure future projects are both efficient and financially practical. The knowledge and experience gained will position COEG to support regional and state efforts to transition toward a low-carbon built environment.

Municipal facilities serve as visible, tangible examples of building improvements that are becoming increasingly important across the community. City Hall, community centers, and other public buildings provide opportunities to showcase technologies and approaches that can be applied in homes and businesses throughout Elk Grove. When residents experience modern, efficient systems in everyday settings, the path toward community-wide decarbonization becomes more transparent and accessible.

STRATEGY BF-1

Electrify and Decarbonize COEG Buildings and Facilities

Reduction Potential

By 2030: 262 $MTCO_2e$

By 2045: 1,588 $MTCO_2e$

Objectives

- Electrify new and existing COEG-owned buildings and facilities.
- Transition away from natural gas use.

Strategy Summary

Municipal buildings and facilities offer opportunities to reduce COEG's operational carbon footprint while improving indoor air quality. Electrifying City-owned buildings and integrating carbon-free backup power will strengthen energy resilience during grid disruptions, reduce natural gas use, and serve as a practical model for broader community adoption of building decarbonization.

Implementing Actions

Action BF-1.1: Adopt a policy that requires all new COEG buildings to be all-electric starting in 2026, and additionally, that requires existing buildings purchased by COEG to be fully electrified with remodeling/upgrades.

Action BF-1.2: Develop and implement a roadmap outlining the necessary steps and timeline for electrifying all existing COEG buildings and facilities, including a detailed inventory of current building systems, and a prioritized list of buildings for electrification based on factors such as age of equipment, energy use intensity, and necessary electrification measures. The roadmap should also include cost estimates, potential funding sources, and projected energy savings and GHG emissions reductions for each project.

Action BF-1.3: Conduct a feasibility study and cost analysis of replacing the natural-gas-powered pool heating system at the Aquatics Center with an electric or other zero-emission heating system, and based on findings, implement the replacement as soon as feasibly possible.

STRATEGY BF-2

Increase Renewable Energy Use and Storage

Reduction Potential

By 2030: 1,762 $MTCO_2e$

By 2045: 0 $MTCO_2e$

Objectives

- Transition to a carbon-free electric grid.
- Expand battery storage capacity.
- Promote the installation of renewable energy systems.

Strategy Summary

As climate impacts intensify and energy resilience grows more critical, COEG's shift to renewable energy and battery storage is an important investment. Partnering with SMUD and strategically deploying solar and storage systems at municipal facilities will build more resilient energy infrastructure that lowers emissions and also ensures essential services remain operational during grid disruptions and extreme weather.

Implementing Actions

Action BF-2.1: In coordination with SMUD, ensure that electricity used at COEG buildings and facilities, along with electricity used for streetlights and traffic lights, is sourced from renewable sources to the maximum extent possible.

Action BF-2.2: Continue to install solar and battery storage systems on suitable COEG buildings and facilities, prioritizing installations based on solar potential, historic energy consumption, roof condition, available site area, and potential cost savings.

Action BF-2.3: Procure renewable diesel for use in all diesel-powered generators by 2030 and transition to carbon-free backup power supplies by 2045.

STRATEGY BF-3

Reduce Energy Consumption

Reduction Potential

Included in BF-1 and BF-2

Objectives

- Decrease energy use.

Strategy Summary

Energy efficiency is a cornerstone of the *Climate Compass*, offering immediate emissions reductions, lower utility costs, and less strain on the electrical grid. Upgrading building systems and integrating smart controls will transform COEG facilities into high-performance spaces that maintain comfort and functionality while using less energy and complementing COEG's broader electrification and renewable energy efforts.

Implementing Actions

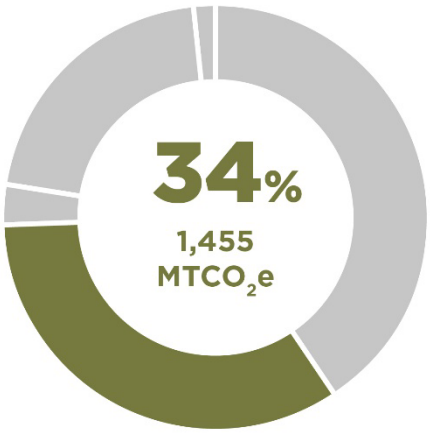
Action BF-3.1: Develop and adopt a green building policy requiring all new COEG buildings to meet CALGreen Tier 1 standards, establishing requirements for energy-efficient design, renewable energy integration, water conservation, and sustainable materials use.

Action BF-3.2: Phase in the installation of a building energy management system (BEMS) in COEG buildings and facilities that provides real-time monitoring and control of energy usage, allowing for optimization of heating, cooling, and lighting systems. Each BEMS will include smart sensors, automated controls, and data analytics capabilities to identify energy-saving opportunities. Phasing should start with the largest energy-consuming buildings and facilities and gradually expand to all facilities. Include required training and technical support to properly use each system.

Action BF-3.3: Conduct an audit of HVAC systems in all existing COEG buildings and develop a schedule for end of useful life replacement of outdated systems with high-efficiency models, including features like variable refrigerant flow (VRF) systems and appropriately placed smart thermostats, and implementing regular maintenance to ensure optimal performance.

Action BF-3.4: Establish a retro-commissioning program for all existing COEG buildings, which encompasses a systematic process to identify and implement operational and maintenance improvements, and aims to optimize building systems, reduce energy consumption, improve occupant comfort, and extend equipment life.

FLEET AND EMPLOYEE COMMUTE



Total Emissions from Vehicle Fleet and Employee Commute Sectors in 2021

Fleet and employee commute make up the second largest share of COEG's operational emissions, with fleet vehicles and employee commute together accounting for 34 percent of municipal emissions.

Fleet electrification takes advantage of rapidly improving vehicle technologies and declining costs while reducing maintenance needs and simplifying operations. A mix of incentives, infrastructure improvements, and flexible work arrangements for employee commutes can reduce single-occupancy vehicle trips while boosting staff morale. These complementary strategies offer multiple, adaptable pathways for reducing emissions based on departmental needs and operational priorities.

Transitioning COEG operations to a low-carbon transportation system aligns with broader regional mobility trends and infrastructure investments. By partnering with regional agencies to expand charging infrastructure, COEG can achieve greater network coverage at a lower cost. Similarly, employee commute programs that connect with regional transit efforts offer more comprehensive travel options for staff.

COEG is working to support a more flexible work environment while modernizing municipal transportation practices. As transportation technologies continue to evolve, the adoption of clean fleet vehicles and the expansion of commuting options position them to contribute meaningfully to broader sustainability goals.

STRATEGY FEC-1

Reduce COEG Employee VMT

Reduction Potential

By 2030: 87 $MTCO_2e$

By 2045: 45 $MTCO_2e$

Objectives

- Reduce employee commute emissions.
- Promote sustainable transportation options to work.
- Support active and low-carbon commuting.

Strategy Summary

The daily transportation choices of COEG employees create ripple effects throughout the community's transportation system, traffic patterns, and climate efforts. Thoughtfully designed commute programs and mobility options will shift how employees travel to and from work, helping establish a culture where sustainable transportation is the convenient and accessible choice.

Implementing Actions

Action FEC-1.1: Conduct regular COEG employee commute surveys (i.e., every 2-3 years) to understand commute patterns and quantify associated trips and VMT and to incorporate findings into future GHG inventory updates.

Action FEC-1.2: Develop an employee carpool matching system that is integrated into COEG's intranet, which would allow employees to input their commute details and preferences and match them with suitable carpool partners. Provide incentives for regular use of the system, including COEG merchandise, or small quarterly stipends.

Action FEC-1.3: Partner with SacRT to establish a program offering monthly public transit passes to COEG employees.

Action FEC-1.4: Establish a guaranteed ride home program that provides rides for COEG employees in the form of vouchers for rideshare or taxi services up to a certain number of times per year. The program would be intended for employees who use more sustainable transportation modes for their commute, such as public transit, carpooling, biking, or walking, and would prevent employees from being stranded in the event of public transit schedule changes, damage to their bicycle, or other unexpected situations.

Action FEC-1.5: Conduct a review of COEG buildings and facilities to identify opportunities to increase amenities that encourage biking, such as bicycle parking/storage, shelters, end-of-trip facilities (e.g., repair stands, bicycle wash stations, showers, locker rooms), and electric bicycle charging infrastructure.

Action FEC-1.6: Launch an annual VMT reduction challenge for COEG employees, which would encourage departments or teams to compete in reducing their collective VMT over a set period each year by offering prize incentives for the winning team(s).

Action FEC-1.7: Establish an e-bike lending library for COEG employees to use as an alternative to vehicle use for intracity travel during work hours.

Action FEC-1.8: Develop and implement an incentive program for COEG employees who purchase a bike/e-bike for their commute (e.g., walking, biking). Incentives may include COEG merchandise, reimbursement up to a specified amount for the purchase of a bike/e-bike, or other benefits that are correlated with the number of days commuted using active transportation modes.

STRATEGY FEC-2

Shift to Clean On-Road and Off-Road Vehicles and Equipment

Reduction Potential

By 2030: 369 $MTCO_2e$

By 2045: 722 $MTCO_2e$

Objectives

- Expand EV charging infrastructure at COEG facilities.
- Electrify COEG's on-road vehicle fleet.
- Increase the share of employee commute vehicles that are electric or plug-in hybrid.

Strategy Summary

Electrifying COEG's diverse fleet of vehicles and equipment offers benefits beyond emissions reduction, including lower operating costs, quieter performance, and cleaner air for workers and residents. This shift creates a foundation for broader adoption of clean transportation technologies by building essential charging infrastructure and demonstrating the effectiveness of EVs and equipment across a wide range of municipal applications and operating conditions.

Implementing Actions

Action FEC-2.1: Continue to implement the *Infrastructure Plan for Fleet Electrification* (and future updates) to transition COEG's vehicle fleet to ZEVs (mostly EVs) and to continue scaling up and providing ongoing maintenance for the infrastructure required to support an all-electric COEG fleet, including the deployment of EV charging stations at appropriate locations.

Action FEC-2.2: Develop a policy to require greater use of low- and zero-emission off-road vehicles and encourage electric equipment (e.g., landscaping, construction) for City-owned equipment, City-funded projects, and City contractors.

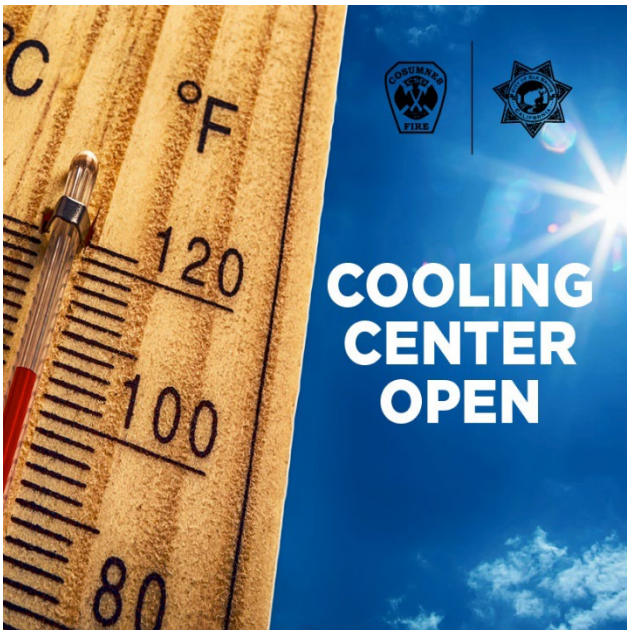
RESILIENCE

As climate impacts intensify, resilience has become a cornerstone of COEG's operational planning. While GHG reduction strategies target the root causes of climate change, resilience efforts focus on preparing systems to withstand and recover from climate-related hazards. For Elk Grove, these hazards include prolonged droughts, extreme heat events, wildfire smoke, and increased flood risks, all of which can potentially disrupt essential services and damage critical infrastructure.

Resilience strategies are not directly reflected in COEG's GHG municipal emissions inventory and forecast, but they offer benefits that strengthen community and employee wellbeing.

Building municipal resilience means more than protecting physical assets like facilities and fleet vehicles—it ensures daily uninterrupted delivery of the essential services residents rely on. When COEG facilities remain operational during climate emergencies, they help sustain government functions while offering safe, accessible spaces for the public. Strategic investments in building upgrades, backup power systems, and adaptable operations strengthen COEG's ability to respond effectively to disruptions and support the community when needed.

This effort recognizes that resilience should be embedded in day-to-day operations, not as a standalone effort. Climate-informed planning and design decisions today can deliver long-term benefits while helping to reduce future risks and costs. Thoughtful integration of resilience into infrastructure planning, maintenance practices, and emergency preparedness creates a more adaptive municipal system that can meet today's needs while staying responsive to evolving climate conditions.



STRATEGY RS-1

Protect COEG's Assets and Utilize COEG Facilities to Protect the Community from Climate Hazards

Reduction Potential

Not Quantified

Objectives

- Assess climate risks to COEG's assets.
- Adopt resilient building standards.
- Retrofit facilities for climate resilience.
- Expand heat and flood mitigation measures.

Strategy Summary

Climate impacts such as extreme heat, flooding, and wildfire smoke increasingly threaten COEG's infrastructure and its capacity to provide essential services during emergencies. Integrating climate resilience into municipal buildings and maintenance practices will help ensure facilities remain operational when most needed and create cooler, safer environments that showcase practical adaptation strategies for the wider community.

Implementing Actions

Action RS-1.1: Conduct an updated, comprehensive climate change vulnerability assessment specific to COEG's physical assets (e.g., buildings, facilities) and planned Capital Improvement Program projects, and based on findings, develop a prioritized list of COEG assets requiring climate adaptation interventions.

Action RS-1.2: Develop a policy that establishes heat-resilient building standards for all new COEG construction and major renovations, which addresses aspects such as green/cool roofs, enhanced insulation, and passive cooling design elements.

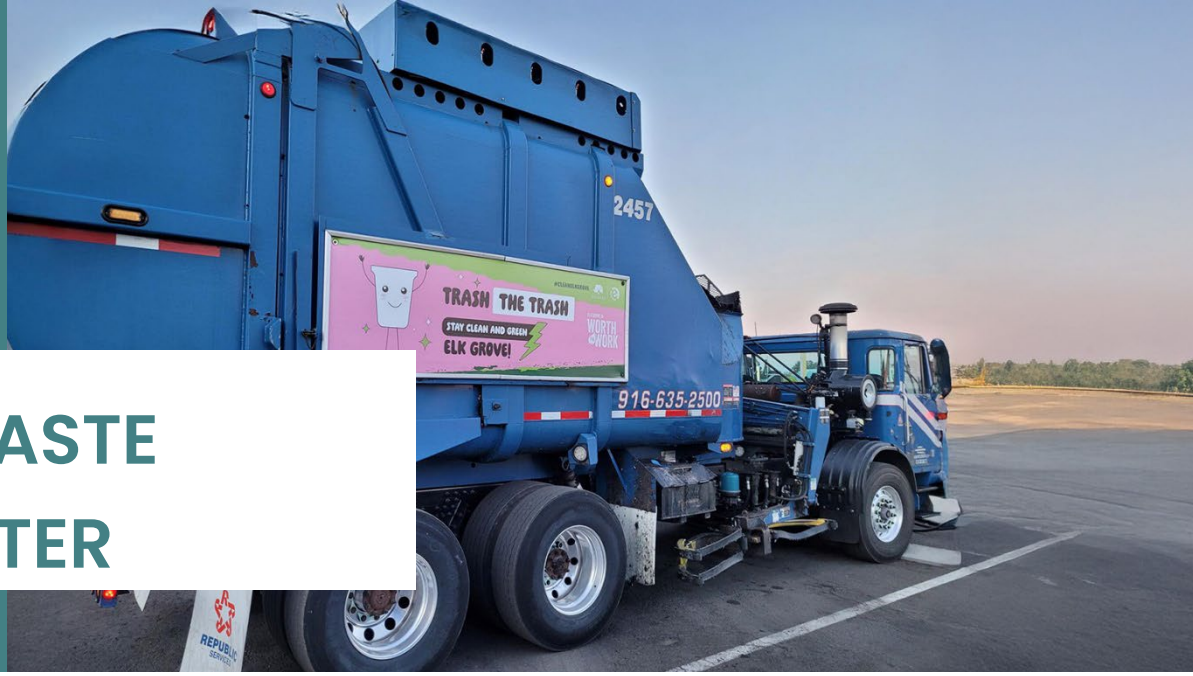
Action RS-1.3: Retrofit existing COEG buildings and facilities to improve their resilience to climate hazards, such as extreme heat and extreme precipitation. Determine and implement solutions that are tailored and feasible for each building or facility.

Action RS-1.4: Develop a policy mandating the consideration of future climate projections in Capital Improvement Program projects that includes a checklist of resilience measures to be considered for different types of projects (e.g., buildings, roads, parks).

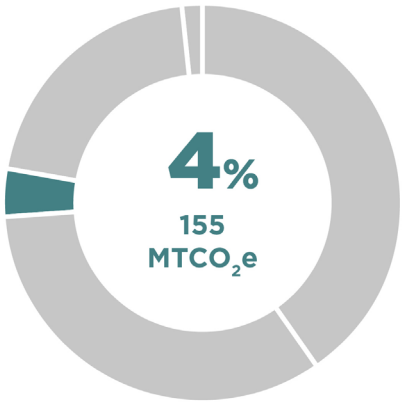
Action RS-1.5: Install cooling strategies and/or permeable pavement on COEG parking lots to help reduce the urban heat island effect and provide additional flood protection, prioritizing permeable pavement in lots or areas that are more flood prone. Test different types of cool and permeable pavement materials, and based on results, develop guidelines for broader implementation throughout the city.

Action RS-1.6: Plant shade trees and add other heat-mitigating amenities around COEG buildings and facilities, such as reflective pathway surfaces, more shaded seating areas, hydration stations, and misters, among other amenities.

Action RS-1.7: Implement rigorous preventive maintenance schedules for all COEG infrastructure to enhance their longevity, bolster their resilience, and reduce the need for new materials (i.e., for premature repairs and replacement).



SOLID WASTE AND WATER



Total Emissions from Solid Waste and Water Sectors in 2021

Water and waste management activities account for 4 percent of COEG's operational emissions.

Water systems require energy throughout their lifecycle—from pumping and treatment to distribution—while organic waste in landfills generates methane. Although these areas represent a smaller portion of emissions compared to other sectors, reducing water use and promoting sustainable waste management deliver benefits far beyond emissions reduction and are essential to advancing COEG's broader resources consumption goals.

Water conservation across municipal operations is a necessary response to California's increasingly variable climate. COEG buildings, parks, and landscaped medians offer opportunities to showcase water efficiency strategies. Smart irrigation systems, drought-tolerant landscaping, and facility water audits help reduce consumption while maintaining essential services and public amenities. These efforts strengthen resilience during drought and restrictions, lower utility costs, and are visible examples of effective conservation.

Complementing a resource-conscious approach, sustainable waste management practices improve the flow and handling of materials. Enhanced recycling and composting programs, environmentally preferable purchasing policies, and waste reduction initiatives help COEG reduce disposal costs and environmental impacts. These efforts support COEG's broader goals of promoting a circular economy, where materials are reused, repurposed, or recycled to their highest value, advancing operational efficiency and resource stewardship.

STRATEGY WW-1

Reduce Water Use

Reduction Potential

By 2030: 1 $MTCO_2e$

By 2045: 0 $MTCO_2e$

Objectives

<u>By 2030:</u>

- Reduce indoor and outdoor water use.
- Transition to drought-tolerant landscaping.
- Improve irrigation and water system efficiency.

Strategy Summary

As California faces increasingly frequent and severe droughts, every gallon saved enhances COEG's climate resilience and reduces the significant demands of municipal water sources. Strategic water management across COEG facilities provides an opportunity to demonstrate drought-tolerant landscapes and efficient irrigation technologies that maintain functional public spaces with significantly less water.

Implementing Actions

Action WW-1.1: Develop and implement a plan to gradually replace water-intensive landscaping (e.g., turfgrass that is not intended for recreational use) at COEG and CCSD-managed facilities and parks with native, drought-tolerant plants and/or permeable hardscaping, which should include a phased and prioritized implementation schedule. As part of plan implementation, update COEG's landscape guidelines to reflect appropriate planting and maintenance guidance for drought-tolerant landscaping.

Action WW-1.2: Upgrade all COEG- and CCSD-managed irrigation systems to smart, weather-based systems that use real-time weather data and soil moisture sensors to optimize watering schedules and reduce overwatering, and develop a maintenance and monitoring program to ensure long-term efficiency.

Action WW-1.3: Conduct periodic water use audits for all COEG buildings and facilities, which will help to identify leaks, inefficient fixtures, and opportunities for water reuse. Based on annual audit results, develop a list of water-saving upgrades and needed operational changes.

STRATEGY WW-2

Practice Sustainable Waste Management

Reduction Potential

By 2030: 20 $MTCO_2e$

By 2045: 94 $MTCO_2e$

Objectives

- Increase waste diversion.
- Implement zero-waste practices for City events.
- Promote use of recycled materials for City projects.

Strategy Summary

Municipal operations involve daily decisions about purchasing, using, and disposing of materials, each impacting COEG's overall waste management. Reimagining how materials flow through facilities—from procurement to reuse or disposal—enables COEG to reduce waste generation and enhance the recovery of valuable resources. Recognizing that effective climate action depends on how materials are used and disposed of supports a circular approach to municipal services.

Implementing Actions

Action WW-2.1: Conduct a review of existing COEG procurement and operational practices and adopt practices that further avoid the generation of waste, such as using reusable materials, compostable products, and reduced packaging. Additionally, develop training for COEG employees on sustainable purchasing, procurement, and operations to maximize avoidance of waste generation, and conduct periodic waste audits to measure the success of existing efforts and inform potential changes to policies or procedures, as necessary.

Action WW-2.2: Increase recycling and organic waste diversion at all COEG buildings and facilities by inventorying and identifying needs for additional recycling and food waste bins and appropriate signage and education opportunities (e.g., regular staff presentations, mini workshops) to inform/educate employees and the public on proper waste disposal and recycling.

Action WW-2.3: Institutionalize a sustainable events policy that requires zero waste at events hosted by COEG.

Action WW-2.4: Adopt a policy that requires minimum recycled content in construction materials for COEG construction and maintenance projects, and includes the development of a preferred materials list. Regularly update the policy to reflect advancements in recycled material technology and availability.

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CHAPTER 5

IMPLEMENTATION AND MONITORING

Chapter 5
Implementation and Monitoring

This chapter outlines the strategy for implementing the *Climate Compass*, including how progress on GHG reduction targets and climate adaptation goals will be monitored and evaluated. Transparent progress updates help ensure the *Climate Compass* remains a practical and effective guide for achieving sustainable, climate-resilient outcomes.

5.1 IMPLEMENTATION STRATEGY

The City is committed to the successful implementation of the GHG reduction and climate adaptation strategies outlined in **Chapter 3**. This will require a diverse range of implementing actions led by various City departments. These actions include:

- Developing and enforcing new regulations,
- Creating new programs and enhancing existing ones,
- Securing grant funding,
- Exploring innovative financing,
- Conducting feasibility studies,
- Forming partnerships and collaborating with other government agencies, local businesses, and community organizations,
- Implementing ongoing community education and engagement programs,
- Prioritizing the needs of vulnerable communities, and
- Identifying tracking mechanisms to measure success.

After adoption, the City's Civic Innovation and Sustainability (CIS) Division will monitor the implementation of the *Climate Compass*. CIS will coordinate with other City staff across departments to facilitate and oversee the execution of strategies and actions, while tracking and reporting progress as outlined in the Monitoring section of this chapter.

GHG mitigation strategies and one or more supporting actions described in **Chapter 3**, were developed using a set of guidelines that identified specific implementation categories to ensure that the requirements of California Environmental Quality Act (CEQA) Guidelines of Section 15183.5 are met. Doing so establishes enforceable actions with measurable performance standards that, when implemented, will collectively achieve the GHG reduction targets required for CEQA streamlining.

The Community and Municipal Implementation Plans in **Tables 5-3** and **5-4** translate these strategies into actionable steps by defining departmental responsibilities, community partners, implementation timeframes, and cost estimates. This structured approach enables efficient coordination among departments and provides a clear framework for prioritizing high-impact, near-term actions. Regular monitoring and reporting on these actions will also ensure accountability and demonstrate progress toward Elk Grove's climate goals.

The specificity for each action provides the level of detail necessary for CEQA compliance and creates a transparent roadmap for implementation. The following sections further detail the key implementation elements that will guide the Climate Compass implementation.

City Department Roles

While implementation will be monitored by CIS, collaborative efforts across departments will be essential. Each action identifies a lead department based on its authority and expertise. Departments will incorporate these actions into their work plans, allocate staff resources, and collaborate with CIS to track progress. **Table 5-1** lists all responsible departments, and their abbreviations used throughout the implementation tables.

Table 5-1 Abbreviations for City Departments

Abbreviation	Department Name
CD	Community Development
CM	City Manager's Office
FI	Finance
PD	Police
PW	Public Works

Community Partners

Climate action at this scale relies on collaboration beyond local government. Partnerships with regional agencies, businesses, non-profits, and educational institutions enhance implementation by contributing expertise, resources, and strong community connections. These collaborations help ensure strategies align with local priorities and achieve a broader impact. **Table 5-2** lists the abbreviations of community partners referenced throughout this chapter.

Table 5-2 Abbreviations for Partner Organizations and Agencies

Abbreviation	Action Description
BERC	Business Environmental Resource Center
BIA	North State Building Industry Association
CCSD FD	Cosumnes Community Services District Fire Department
CCSD PR	Cosumnes Community Services District Parks and Recreation Department
EGCG	Elk Grove Community Garden and Learning Center
EGUSD	Elk Grove Unified School District
EGWD	Elk Grove Water District
FLC	Food Literacy Center
GO-Biz	California Governor's Office of Business and Economic Development
GSEC	Greater Sacramento Economic Council
LCWC	Laguna Creek Watershed Council
LRCCD	Los Rios Community College District
Republic	Republic Services
SACDOT	Sacramento County Department of Transportation
SacOES	Sacramento County Office of Emergency Services
SACOG	Sacramento Area Council of Governments
SacRT	Sacramento Regional Transit District
SBCTC	Sacramento-Sierra Building and Construction Trades Council
SCAC	Sacramento County Agricultural Commissioner
SCPH	Sacramento County Public Health
SCWA	Sacramento County Water Agency
SCWMR	Sacramento County Waste Management and Recycling
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SPL	Sacramento Public Library
SRBX	Sacramento Regional Builders' Exchange
STF	Sacramento Tree Foundation
TeamCA	Team California

Implementation Timeframe

The timing of implementation for each action is categorized as near-term (1–2 years), mid-term (3–5 years), long-term (6+ years), or ongoing. Near-term actions can be implemented quickly with existing resources, while mid-term actions require moderate planning and resource allocation. Long-term actions need significant planning and development but are essential to achieving Elk Grove's mitigation and adaptation goals. Ongoing actions require continuous effort or maintenance over time and may span across multiple phases of implementation.

Implementation Cost Estimate

The implementation cost analysis estimates and classifies costs to the City for implementing *Climate Compass* strategies and actions to achieve the GHG emission reduction targets. The goals of this analysis were to:

- develop a preliminary estimate of the total cost to the City to implement the *Climate Compass* over the first five fiscal years (FY 2025/26 – FY 2029/30);
- determine the costs of existing programs and incremental (or new) costs associated with expanded and new programs that would not have occurred without the Climate Compass; and
- provide implementing departments guidance for developing budget requests and identifying funding sources as part of the City's budget process.

The primary inputs of the cost assessment are capital costs (e.g., infrastructure projects and City facility improvements), services and supplies (e.g., consultant costs, materials, supplies), salary and benefits (i.e., City staff salaries, wages, health, and retirement benefits), and incentives (i.e., funding mechanisms or tools used by the City to promote investment, implementation, and adoption of programs). Some of the actions involve one-time activities such as developing a program or plan, or the adoption of an ordinance. Others are ongoing activities, such as comprehensive electrification of existing buildings, structure hardening, or certain infrastructure projects, that have a longer timeframe. Actions that will be initiated following FY 2029/30 were not included in this implementation cost analysis. Finally, the cost assessment did not quantify potential cost savings to the City (e.g., reduced municipal utility bills associated with more efficient buildings and vehicles), nor did it estimate potential costs or savings to the community (e.g., reduced utility bills through home electrification or fuel costs through vehicle electrification).

Total *Climate Compass* implementation costs during FY 2025/26 through FY 2029/30 are estimated to be $53 million, with $21 million (40 percent) of total implementation costs associated with existing City programs. The remaining $32 million (60 percent) of total implementation costs are incremental (or new) costs associated with the expansion of existing City programs ($12 million) and new City programs ($20 million) that would directly result from *Climate Compass* actions. Additional cost information can be found in **Appendix F**.

Funding/Financing

Potential funding sources for implementation costs were identified as part of the implementation cost analysis, understanding that all final funding allocations require City Council approval through the City's annual budget process. Potential funding sources include:

- Elk Grove's general fund (i.e., the primary operating fund for a government derived from sources not specific to any program or service delivery),
- Development Services Fund (i.e., a type of fund used by the City to account for goods or services to the general public),
- Special funds (e.g., Measure E, Measure A, Gas Tax, enterprise funds, CFF Transit) that are derived from fees for services or deposits for specific purposes,
- Development Impact Fees (i.e., one-time charges levied by the City on new development to offset the costs of infrastructure and public services),
- Mitigation Fees (e.g., VMT Mitigation Fund and Active Transportation Fees) are charges imposed on development projects to offset the impact of new construction on public facilities and services), and
- Grant funding.

As part of the City's annual budget and the *Climate Compass* implementation processes, City staff will continue to evaluate funding sources and financing strategies to reduce the fiscal impact of *Climate Compass* actions. For example, federal and State funding sources may be available for public sector climate-related investments through the Inflation Reduction Act, Bipartisan Infrastructure Law, California Greenhouse Gas Reduction Fund, and the State of California Budget, among others. Additional funding source information can be found in **Appendix F**.

5.2 IMPLEMENTATION PLAN

Tables 5-3 and **5-4** present the Community and Municipal Implementation Plans, outlining how the City will translate Climate Compass actions into specific deliverables. Each action is organized by timeframe and identifies responsible departments, community partners, estimated costs, and potential funding sources, offering a clear roadmap for advancing climate mitigation and adaptation efforts.

By prioritizing high-impact and near-term actions, the City can build momentum and demonstrate visible progress while developing the capacity for more complex initiatives. Near-term actions lay the groundwork for long-term transformation. This phased approach keeps climate action and adaptation fiscally responsible and effective, allowing the City to adapt priorities as technologies evolve, funding becomes available, and community needs shift.

Implementation Considerations

The successful implementation of the Climate Compass depends on a flexible, adaptive approach that can respond to changes in technology, funding, and community needs. The City can use these considerations to guide decision-making across all Climate Compass actions, supporting thoughtful and context-sensitive implementation while maintaining alignment with overall GHG reduction and adaptation goals.

As noted in Section 5.1, City departments and community partners play key roles in implementing actions. They can be effective at reducing barriers, identifying opportunities, and ensuring strategies complement existing programs and policies. Regular coordination through check-ins, asynchronous feedback, or strategy-specific collaboration will help leverage expertise, share resources, and support innovative planning approaches. Through these partnerships, the City can better anticipate challenges, align actions across initiatives, address communications gaps, and make informed decisions. This will promote efficiency and allow the City to respond to evolving community needs.

Equity, affordability, and inclusion should also be at the forefront of implementation decisions. Actions should consider how benefits, costs, and access are distributed among residents, businesses, and neighborhoods, with attention to communities with higher vulnerabilities. This includes being mindful of potential impacts on renters, small businesses, non-English speakers, and other groups that may face barriers to participation or to accessing the benefits of the Climate Compass. Engagement and outreach during implementation should be tailored to Elk Grove's diverse community and designed to reach a broad cross-section of groups. Efforts to build new partnerships, along with collaboration with trusted local organizations and those engaged during the Climate Compass planning process, can further strengthen outreach efforts.

The Climate Compass emphasizes near-term actions; however, implementation efforts will still consider long-term system efficiency, resilience, and infrastructure planning. Long-range planning and investment considerations can benefit from a broader perspective that evaluates lifecycle impacts, operational implications, and opportunities for coordination across actions. Tools such as mapping and spatial analyses can help identify opportunities to enhance environmental benefits, improve connectivity between green spaces, and increase community resilience to climate-related hazards such as extreme heat and flooding. Incorporating this broader view allows the City to prioritize actions that deliver multiple benefits, reduce long-term costs, and ensure that investments remain effective under evolving conditions.

Actions should also be designed to support reliability, flexibility, and resilience as conditions evolve. For example, implementation may include approaches that enhance system stability and preparedness at critical facilities, while also remaining adaptable to future technologies, delivery models, and community needs. Consideration may include energy storage, backup systems, and opportunities to integrate

distributed energy resources, which can further strengthen reliability and provide flexibility for both municipal operations and the broader community.

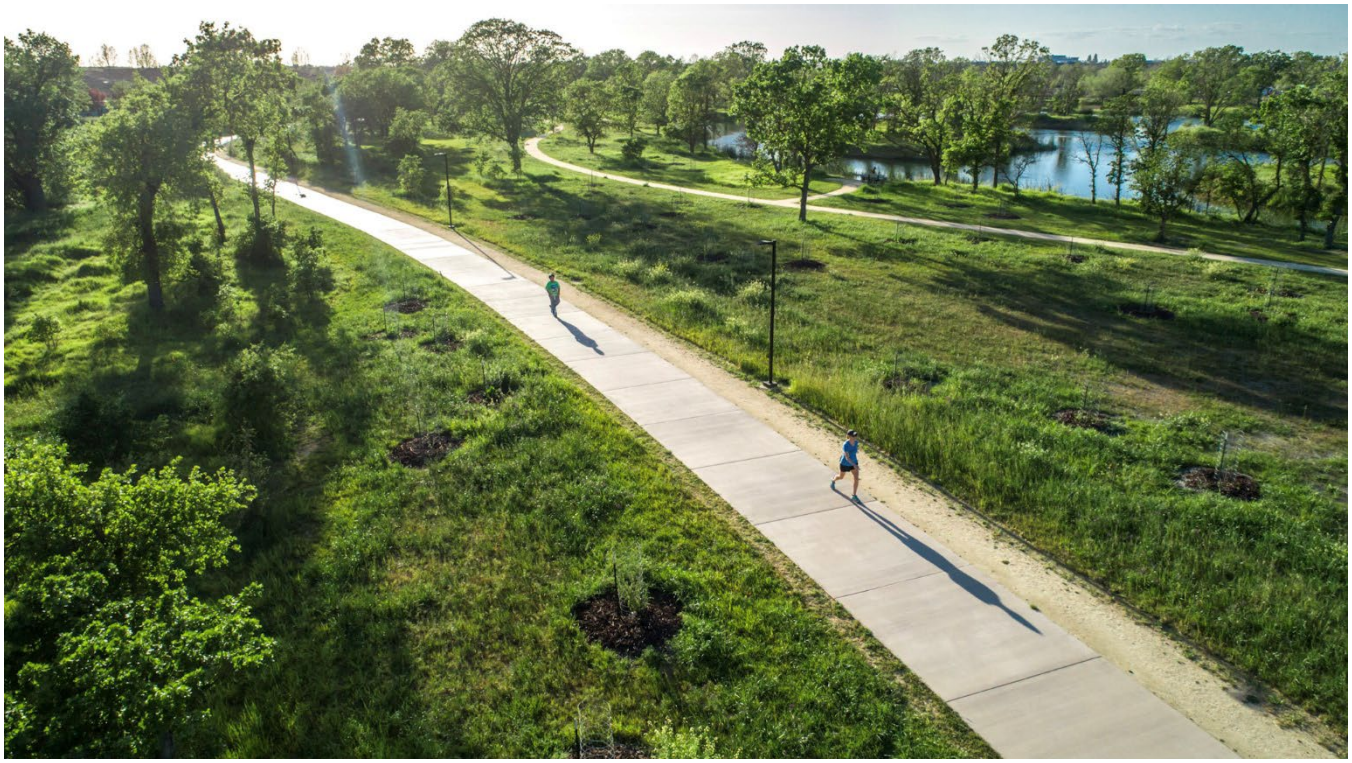
Mobility, access, and public comfort are also important considerations across all actions. Where appropriate, implementation of specific actions can account for safety, accessibility, and users' experiences in public spaces, including exposure to heat and other environmental conditions. For example, evaluating the placement of shade, seating, lighting, and wayfinding, and designing routes and facilities that accommodate diverse users, can help create spaces that are comfortable and easy to navigate.

Incorporating Community Feedback

The Climate Compass reflects the priorities and insights gathered through community engagement, as summarized in Figure 1-7. Community feedback emphasized the importance of creating a healthier, more resilient, and sustainable city. The public and community partners helped shape strategies that integrate clean energy, efficient buildings, sustainable mobility, and nature-based solutions into the City's planning and investments, ensuring that strategies and actions address both current needs and long-term challenges.

The Climate Compass emphasizes practical, accessible, and inclusive approaches. Strategies and actions intend to reduce environmental impacts while also improving quality of life, supporting public health, and strengthening resilience to future climate impacts. Implementation aims to deliver tangible and widely accessible benefits across the city, including supporting home and building electrification, expanding public transit and active transportation options, increasing tree canopy, and promoting water efficiency.

Grounding climate strategies in community feedback ensures outcomes reflect the priorities and aspirations of Elk Grove's communities. This approach fosters a citywide culture that can respond to climate risks while promoting equity, adaptability, and long-term well-being.



Community Actions

Table 5-3 Community Implementation Plan

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
Ongoing					
BE-3.1	Support and coordinate with SMUD in executing its *2030 Zero Carbon Plan*.	CM, CD, PW	SMUD	$38,082	General Fund
TR-1.1	Implement the infrastructure, programmatic, and policy recommendations included in the Bicycle, Pedestrian, and Trails Master Plan.	CM, CD, PW	EGUSD	$ 16,651,957	Gas Tax, Measure A, General Fund, Active Transportation Fee
TR-1.2	Coordinate with SacRT to improve the city's public transit system by increasing reliability and accessibility as well as by adding amenities such as seating, lighting, tree cover, and real-time arrival information displays. Extend service hours and routes to better serve residential areas, employment centers, and popular destinations, with a focus on "Transportation-Based Priority Populations" as identified by Caltrans' Transportation Equity Index.	CM, PW	SacRT	$1,499,493	Gas Tax, Measure A, CFF Transit, VMT Mitigation Fund
TR-1.5	Partner with Elk Grove Unified School District (EGUSD) to establish and better monitor Safe Routes to School programs aimed at promoting safe walking, biking, and other active transportation modes for students and families.	CM, PW	EGUSD	$19,853	Gas Tax, Measure A
TR-2.5	Partner with SMUD to promote ZEVs and provide information on available incentives.	CM	SMUD	$8,774	General Fund
RA-2.2	Continue to implement and work with developers to update as needed, the Storm Drainage Master Plan (SDMP) and ensure that candidate watershed projects and future development proposals associated with the City's storm drainage and flood control collection system are consistent with the City objectives.	PW	N/A	$29,698	General Fund
RA-4.5	Seek funding to further implement heat-mitigating public amenities, such as drinking fountains, water mister/spray areas, and shade structures in parks and other community gathering areas throughout the city, in collaboration with CCSD, EGUSD, and other appropriate partners.	CM	CCSD PR, EGUSD	$25,181	General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RA-5.2	Develop and adopt an Urban Forest Master Plan to sustainably manage and increase tree canopy across the city, which includes or identifies: (1) potential new tree planting sites with a priority emphasis on areas with low canopy coverage (i.e., under 15 percent); (2) native tree species and design guidelines; and (3) best practices in watering and maintenance practices, along with street and park tree preservation.	PW, CM	STF	$321,134	General Fund, Grant Funds
RA-5.5	Continue to partner with STF to strengthen the city's public and private tree canopy through the increased usage and/or expansion of existing programs, such as "Sacramento Shade," which currently offers a free landscape assessment and up to 10 free shade trees for SMUD customers (e.g., homeowners, renters, and businesses), among other programs.	PW	STF, SMUD	$9,350	General Fund
RC-1.1	Expand the City's existing organic recycling program for multifamily complexes, schools, and commercial businesses, by increasing access to centralized organic waste dumpsters and providing resources for implementing and/or improving source separation of food waste.	PW, CM	SCWMR	$157,034	Enterprise Fund, SWCC Fund 506
RC-1.3	Encourage residents and businesses to actively participate in the City's food waste recycling program through increased education and outreach.	PW, CM	Republic	$161,376	Enterprise Fund, SWCC Fund 506
RC-2.1	Use the Sacramento County waste characterization study to provide information on actionable recommendations for waste reduction and diversion by residents and businesses in Elk Grove.	PW, CM	SCWMR	$50,580	Enterprise Fund
RC-2.3	Continue to incentivize residents to reduce the amount of waste they generate and send to landfills through waste collection fee adjustments that increase fees for solid waste containers and do not charge fees for additional recycling and organic waste containers that are included in garbage service.	PW	Republic	$2,932	Enterprise Fund
RC-3.2	Continue collaborating with Elk Grove Water District, Sacramento County Water Agency, and other water providers to participate in regional water-saving initiatives, encourage voluntary water conservation measures, and share best practices for water conservation strategies.	PW	EGWD, SCWA	$49,858	General Fund, Grant Funds
RC-3.4	Regularly review and update the Water Efficient Landscape Ordinance to comply with evolving state laws.	CD	N/A	$16,715	Development Services Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
CA-1.3	Partner with SMUD to establish a comprehensive community outreach and education campaign to raise awareness about the benefits of building electrification, available incentives and programs, and the importance of decarbonizing the building sector.	CM	SMUD	$64,627	General Fund
CA-1.4	Partner with SMUD to promote its Residential, Neighborhood, and Commercial SolarShares programs, which allow residential customers, commercial customers, and developers to purchase renewably sourced electricity without having a solar system onsite.	CM	SMUD	$64,627	General Fund
CA-1.5	Work with regional partner agencies and utilities, such as SMAQMD and SMUD, to promote rebates and incentives for installing both residential and nonresidential renewable energy (e.g., solar) and battery storage systems.	CM	SMAQMD, SMUD	$64,627	General Fund
CA-3.2	Continue conducting public education and outreach to raise awareness about the significance of water conservation, offer practical tips for reducing water consumption, and emphasize the opportunities accessible to residents for decreasing water usage.	CM	EGWD, SCWA	$44,514	General Fund
CA-4.1	Prepare and publish an annual report summarizing the City's progress towards its GHG reduction and adaptation goals, using the KPIs and other relevant metrics. Include narratives highlighting key accomplishments, challenges, lessons learned, and case studies of successful projects and initiatives. Present the report to the City Council to inform future climate action and adaptation-related budget and policy decisions.	CM, FI	N/A	$31,343	General Fund, Development Services Fund
CA-4.2	Regularly update data on progress towards the City's climate action and adaptation goals, including KPIs, in a clear and transparent manner for community members.	CM	N/A	$42,310	General Fund, Development Services Fund
Near Term					
BE-1.1a	Adopt by ordinance a new building reach code (based on cost-effectiveness studies, stakeholder outreach, and subject to California Energy Commission approval) setting energy efficiency standards that must be met by all nonresidential new construction and major renovations.	CD, CM	BIA, SBCTC, SRBX	$232,940	General Fund, Development Services Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
BE-1.1b	Promote and encourage voluntary actions for the construction of new residential buildings that provide greater energy efficiency and reduced GHG emissions than otherwise required by the building codes.	CD, CM	BIA, SBCTC, SRBX	0[1]	Not applicable
BE-1.2	Develop a comprehensive building energy retrofit plan to transition existing residential and nonresidential buildings to all-electric.	CD	SMUD	$415,486	Development Services Fund, Grant Funds
BE-1.3	Explore partnerships with regional organizations or grant opportunities to develop a funding mechanism (e.g., revolving loan fund, grant program) to support low-income households with covering the cost of time-of-replacement/emergency replacement of water heaters and/or HVAC units with electric options, as well as any necessary electrical upgrades.	CM, CD, FI	SMUD	$292,961	General Fund
BE-1.4	Partner with SMUD to explore offering on-bill financing or pay-as-you-save programs specifically for building electrification projects.	CM	SMUD	$12,883	General Fund
BE-1.5	Adopt by ordinance a standard that is compliant with State and Federal law for the conversion of HVAC to heat pump systems for existing nonresidential buildings.	CD	SMUD	$109,373	General Fund
BE-2.1	Prepare and adopt land use plan and zoning revisions that increase the allowed density and intensity of development along the city's major transit corridors.	CD	N/A	$100,389	Development Services Fund
BE-4.1	Establish a program that connects owners and occupants of residential and nonresidential buildings to existing energy audit and weatherization programs (e.g., California's *Low-Income Weatherization Program*) and resources, and additionally, helps to determine eligibility.	CM	SMUD	$30,742	General Fund, Development Services Fund
BE-4.3	Coordinate with SMUD to promote their Energy Assistance Program Rate for low-income residential customers, which provides a monthly discount on a qualified customer's energy bill, to ensure all eligible residents are enrolled at this rate.	CD, CM	SMUD	$23,486	General Fund
TR-1.3	Develop a local Transportation Management Agency, which works with residences and businesses to provide education on transit and alternative transportation services and programs, and provides other supportive programs that work to reduce VMT and increase transit use.	CM, CD	N/A	$45,743	Gas Tax, Measure A, Development Services Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
TR-1.4	Expand an electric bike (e-bike) incentive program to encourage residents to purchase and use e-bikes for commuting and local trips instead of driving. Incentives will be provided as subsidies or discounts on e-bike purchases.	CM	N/A	$251,288	Gas Tax, Measure A, General Fund, VMT Mitigation Fund
TR-1.7	Develop public awareness campaigns promoting the benefits of active transportation, public transit, and ridesharing.	CM	SacRT	$61,252	Gas Tax, Measure A, General Fund
TR-2.1	Adopt an ordinance requiring higher EV charging infrastructure for new commercial development.	CD	SMUD	$80,765	Development Services Fund, General Fund, Grant Funds
TR-2.2	Conduct a citywide study to identify optimal locations for public and multifamily residential EV charging stations based on traffic patterns, proximity to major destinations, equity, and existing electrical infrastructure.	CD, CM	SACOG, SMUD	$227,617	Development Services Fund, Grant Funds
TR-2.3	Formalize a partnership with SMUD to collaborate on EV infrastructure planning, defining shared goals, responsibilities, and a framework for coordinating EV infrastructure planning, rate structures, incentive programs, and educational initiatives.	CM, CD	SMUD	$31,496	General Fund
TR-2.4	Require new publicly accessible (non-card-lock) fueling stations to include one DC fast charger (DCFC) for each two fuel dispenser positions, with a minimum of one half of the required DCFC chargers to be installed and the remainder of the spaces to be EV Capable. This requirement may also satisfy the EV requirements for any on-site convenience store.	CD, CM	N/A	$38,748	Development Services Fund, General Fund
TR-3.1	Require all construction projects starting in 2026 and later to use renewable diesel in diesel-powered construction equipment.	CD	SMAQMD	$13,624	Development Services Fund, General Fund
RA-2.1	Coordinate with CCSD to identify potential locations for future large-scale, low-maintenance rain or pollinator gardens within the city (emulating the Elk Grove Rain Garden Plaza across from Colton Park), which can provide a range of benefits, such as reduced flooding, improved water quality, improved aesthetics, and being utilized as wildlife habitat.	CD, PW, CM, FI	CCSD PR	$11,761	Development Services Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RA-3.1	Coordinate with the Sacramento Metropolitan Air Quality Management District (SMAQMD), and other local and regional agencies and organizations to develop a strategy for the widespread awareness and adoption of mobile applications (e.g., Smoke Spotter, AirNow), which can help populations prepare for wildfire smoke events.	PD, CM	SMAQMD	$33,632	General Fund
RA-3.2	In partnership with Sacramento County Public Health and SMAQMD, develop a policy with established criteria and procedures to distribute N95 masks during or in anticipation of wildfire smoke events or prolonged periods of poor air quality.	PD	SCPH, SMAQMD	$21,876	General Fund
RA-4.2	Develop and implement a cool pavement "roadmap" to expand the use of cool pavement across the city. The roadmap will identify pilot locations, potential funding sources, and performance-tracking mechanisms.	CD, CM, PW	SACDOT, SacRT	$557,711	Development Services Fund
RA-4.4	Partner with SacRT to study the feasibility of designing and installing bus shelters that offer protection and relief from heat, considering an array of measures and features.	CD, CM, PW	SacRT	$15,066	Development Services Fund, Gas Tax, Measure A
RA-5.3	In coordination with the Sacramento Tree Foundation (STF), develop and annually update a work plan to identify and budget for specific tree planting and maintenance projects for implementation each year consistent with the goals and targets of the Citywide Urban Forest Master Plan.	PW	STF, CCSD PR	$5,213	General Fund
RA-5.4	Consider updates to the Tree Preservation and Protection Regulations to improve effectiveness and ensure enhancement of tree canopy.	CD, PW, CM	STF, CCSD PR	$48,684	Development Services Fund, General Fund
RA-6.2	Investigate opportunities to establish new parks, greenways, and trail networks to connect existing green spaces and ensure all residents have access to nature.	CD, CM, PW	CCSD PR	$70,413	Development Services Fund, Grant Funds
RA-6.4	Evaluate rural lands for current and historical carbon storage (including mapping and modeling), the potential for future carbon sequestration with restoration, avoided conversion, or management, and the stability of the stored carbon and risk of carbon loss due to climate change or land use change.	CD, CM	SCAC, Resource Conservation Districts	$240,574	Development Services Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RC-2.2	Advance opportunities for reusing, repurposing, and sharing durable goods through partnering with the Sacramento Public Library to expand the Library of Things Program, providing information to residents and businesses related to relevant online platforms (e.g., Buy Nothing, TooGoodToGo, Olio, Vinted, etc.) and increasing public awareness of the Reuse Room at the SWCC.	PW, CM	SPL, SCWMR	$27,302	Enterprise Fund
RC-2.4	Perform a Circular Economy Baseline Assessment of the City's existing waste streams, resource flows, and economic activities to identify opportunities for infrastructure, projects, and materials to be maintained as long as possible and identify areas with the highest potential for circularity.	PW, CM	Republic	$299,698	Enterprise Fund, Grant Funds
GE-1.1	Prioritize the retention, expansion, and attraction of green industry businesses and businesses.	CM	GSEC, TeamCA, GO-Biz	$17,364	General Fund
GE-1.2	Create programs, policies, and incentives that increase retention, expansion, and attraction of green industry and sustainable businesses.	CM	N/A	$179,214	General Fund
GE-1.3	Connect businesses with organizations that recognize sustainability efforts and provide resources like environmental updates, incentives, and educational tools.	CM	BERC	$28,028	General Fund
CA-1.1	Implement the Climate Ambassador Program as a permanent program, which recruits and trains volunteers to serve as local sustainability champions and educators.	CM	N/A	$85,354	General Fund
CA-2.1	Develop an educational campaign to raise awareness about the benefits of electric landscaping equipment.	CM	SMAQMD	$28,774	General Fund
CA-2.2	Develop informational materials to provide information to residents and businesses to support the city's tree canopy.	CM, CD, PW	STF, SACOG	$46,339	General Fund
CA-2.4	Promote circular economy awareness through educational campaigns and programs to educate residents and businesses about circular principles and encourage them to adopt circular practices and behaviors.	PW, CM, FI	SCWMR	$50,403	Enterprise Fund
CA-2.5	Promote California's Clean Off-Road Equipment Voucher Program for professional landscape services, which provides vouchers to purchase zero-emission landscaping equipment.	CM	SMAQMD	$59,447	General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
CA-3.1	Promote the use of smart water management technologies (e.g., smart irrigation controllers, leak detection devices, and real-time water monitoring systems) that provide real-time data on water usage and encourage water conservation.	CM	EGWD, SCWA	$44,348	General Fund
CA-4.3	Conduct regular surveys, focus groups, and assessments to collect participant feedback and gauge shifts in knowledge, attitudes, and behaviors about sustainability.	CM	Climate Ambassadors	$79,416	General Fund
CA-4.4	Establish a dedicated Climate Action Coordinator position within the City to lead climate, resilience, and sustainability initiatives across the City that include (1) supporting implementation of the *Climate Compass*, (2) collaborating across departments and stakeholders on opportunities to achieve the climate, resilience, and sustainability goals, (3) building partnerships with businesses, community organizations, educational institutions, and residents, and (4) pursuing funding and resource opportunities.	CM, FI	N/A	$0[2]	N/A
Midterm					
BE-3.2	Partner with SMUD to expand and strengthen existing participation incentives for their *Virtual Power Plant Pilot Program*, where customers' private solar and battery storage systems can be aggregated and utilized as a renewable, resilient, and reliable backup power supply during emergencies or peak demand periods.	CM, CD	SMUD	$23,521	General Fund
BE-4.2	Partner with SMUD to promote and expand upon their *Home Performance Program*, which bundles various residential energy efficiency upgrades (e.g., heating and cooling systems, heat pump water heaters, air sealing, and insulation) to deliver more savings, comfort, and rebate options.	CM	SMUD	$7,332	General Fund
TR-1.6	Work with existing multi-unit building owners and require new multi-unit developments to install e-bike charging and secure bicycle parking in multifamily residential developments.	CM, CD	Multifamily building owners	$27,133	Gas Tax, Measure A, Development Services Fund, VMT Mitigation Fund
TR-3.2	Prohibit the use of fossil-fuel-powered generators at construction sites in all discretionary projects.	CD	SMAQMD	$39,381	Development Services Fund, General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RA-1.1	Adopt an ordinance for post-disaster recovery and reconstruction that includes provisions for debris clearance, damage assessment, demolitions, re-occupancy and building moratorium criteria, fee waivers and deferrals, for repair and reconstruction.	CD, PW	N/A	$148,101	Development Services Fund, General Fund, Grant Funds
RA-1.2	Utilize the "Sacramento Ready" website as a local climate resilience toolkit, partnering with SacOES, local businesses, and CBOs to distribute informational materials (pertaining to climate and emergency preparedness) to residents, which would be available in multiple languages and include specific considerations for those who may be more vulnerable (e.g., children, individuals with access and functional needs), along with keeping one's home or business safe.	PD	SacOES	$25,143	General Fund
RA-4.1	Evaluate and consider establishing requirements for the use of heat mitigation measures in the public realm, particularly in common community gathering spaces (e.g., playgrounds, parks). Requirements may include the incorporation of: (1) building design features (e.g., varied building heights; setbacks from sidewalks; vertical and horizontal shade features); (2) cooling materials, treatments, and coatings (e.g., for rooftops); (3) multiple layers of shading to maximize coverage throughout the day; and (4) street trees and landscaping.	CD, CM, PW	CCSD PR	$266,954	Development Services Fund, Grant Funds
RA-4.3	Establish a program to assist and incentivize residential and nonresidential building owners in retrofitting existing buildings with cool roofs or green roofs, underscoring the array of co-benefits they have to offer aside from mitigating the urban heat island effect, such as reduced energy costs. As part of the program, consider developing guidelines and linking to an array of external resources for proper maintenance and responsible disposal.	CM, CD	N/A	$622,209	General Fund, Grant Funds
RA-5.1	Adopt an ordinance to require new development to plant an appropriate number of trees on site to provide a 50 percent canopy cover over parking surfaces and a 20 percent canopy cover over the remainder of the site. Exemptions to the ordinance may be provided in cases where tree canopy may conflict with solar photovoltaic system siting on the development site, LID features, when conflicting with the Solar Shade Control Act, or on a case-by-case basis for industrial locations.	CD, PW	N/A	$78,077	Development Services Fund, General Fund, Grant Funds

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RA-6.1	Encourage EGUSD to identify opportunities for schoolyard and campus greening projects. Enhance integration of schoolyard greening efforts with environmental education curricula to foster environmental awareness and engagement among students.	CM, PW	LCWC, CCSD PR	$24,838	General Fund
RA-6.3	Explore incentivizing climate smart land management in the rural area of the city.	CD	N/A	$74,784	Development Services Fund
RC-1.2	Develop an edible food recovery program that encourages food generators (e.g., grocery stores, restaurants, and food service distributors) to execute private agreements with qualified food recovery organizations.	PW, CM	Republic	$80,561	Enterprise Fund, SWCC Fund 506
RC-3.1	Expand the use of recycled water in Elk Grove by extending services into areas planned for service and explore expansion as part of new development areas.	PW	EGWD, SCWA	$7,728,142	General Fund, Grant Funds
RC-3.3	Mandate water efficiency standards for new construction that require water-neutral development for projects expected to exceed the historical water use of a parcel.	CD, PW	BIA, EGWD, SCWA	$85,063	Development Services Fund, General Fund
GE-1.4	Support green industry and sustainable businesses in meeting their hiring needs while prioritizing the training and employment of Elk Grove residents in green jobs.	CM	GSEC, EGUSD, LRCCD	$27,954	General Fund
CA-1.2	Develop a neighborhood resilience committee program to increase connectedness among the community and provide support during climate hazard events.	CM	N/A	$64,002	General Fund
CA-2.3	Partner with CBOs, such as the Elk Grove Community Garden and Learning Center and the Food Literacy Center, to expand gardening and healthy food education opportunities for individuals and families.	CM	EGUSD, EGCG, FLC	$36,717	General Fund
Long Term					
TR-3.3	Provide vouchers to business owners (e.g., landscaping businesses) to convert or replace their gasoline-powered gardening equipment, such as lawnmowers, leaf blowers, and hedge trimmers, with electric or other zero-emission alternative equipment. Work with waste collectors and SMAQMD to ensure proper disposal and/or reuse of gasoline-powered landscaping equipment.	CM	SMAQMD	$0[3]	N/A

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
TR-1.8	Identify opportunities to create new ingress and egress pathways for bicycles and pedestrians within existing residential subdivisions. Require new developments to double the number of pathways compared to current standards.	CD, CM	TBD	$1,593,798	Development Services Fund, Gas Tax, Measure A, Active Transportation Fee, VMT Mitigation Fund

Notes: FY = fiscal year; N/A = not applicable; TBD = to be determined.

1 Action BE-1.1b is anticipated to be completed within existing staff responsibilities.

2 Action CA-4.4 is to establish a dedicated Climate Action Coordinator position within the City to lead climate, resilience, and sustainability initiatives across the city. This position exists already and the job responsibilities associated with the position are reflected across the other Climate Compass actions and their respective costs.

3 Costs associated with implementing Action TR-3.3 has not been estimated because the action is not contemplated to begin within the next five fiscal years.

Municipal Actions

Table 5-4 Municipal Implementation Plan

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
Ongoing					
BF-2.1	In coordination with SMUD, ensure that electricity used at COEG buildings and facilities, along with electricity used for streetlights and traffic lights, is sourced from renewable sources to the maximum extent possible.	CM, PW	SMUD	$10,967	General Fund
BF-2.2	Continue to install solar and battery storage systems on suitable COEG buildings and facilities, prioritizing installations based on solar potential, historic energy consumption, roof condition, available site area, and potential cost savings.	PW, CM	SMUD	$5,435,738	General Fund, CFF
BF-2.3	Procure renewable diesel for use in all diesel-powered generators by 2030 and transition to carbon-free backup power supplies by 2045.	PW, CM	SMUD	$3,321,858	General Fund, Development Services Fund
FEC-1.1	Conduct regular COEG employee commute surveys (i.e., every 2-3 years) to understand commute patterns and quantify associated trips and VMT and to incorporate findings into future GHG inventory updates.	CM	N/A	$17,181	Gas Tax, Measure A, General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
FEC-2.1	Continue to implement the *Infrastructure Plan for Fleet Electrification* (and future updates) to transition COEG's vehicle fleet to ZEVs (mostly EVs) and to continue scaling up and providing ongoing maintenance for the infrastructure required to support an all-electric COEG fleet, including the deployment of EV charging stations at appropriate locations.	CM, PW	SMUD	$3,411,812	General Fund
Near Term					
BF-1.1	Adopt a policy that requires all new COEG buildings to be all-electric starting in 2026, and additionally, that requires existing buildings purchased by COEG to be fully electrified with remodeling/upgrades.	CM, PW	N/A	$16,196	General Fund
BF-1.2	Develop and implement a roadmap outlining the necessary steps and timeline for electrifying all existing COEG buildings and facilities, including a detailed inventory of current building systems, and a prioritized list of buildings for electrification based on factors such as age of equipment, energy use intensity, and necessary electrification measures. The roadmap should also include cost estimates, potential funding sources, and projected energy savings and GHG emissions reductions for each project.	PW, CM	N/A	$422,060	General Fund, Fund 311/Cap Facilities
BF-1.3	Conduct a feasibility study and cost analysis of replacing the natural-gas-powered pool heating system at the Aquatics Center with an electric or other zero-emission heating system, and based on findings, implement the replacement as soon as feasibly possible.	CM, PW	CCSD PR	$213,188	General Fund, Fund 311/Cap Facilities, Grant Funds
BF-3.1	Develop and adopt a green building policy requiring all new COEG buildings to meet CALGreen Tier 1 standards, establishing requirements for energy-efficient design, renewable energy integration, water conservation, and sustainable materials use.	CM, CD, PW	N/A	$23,045	General Fund
BF-3.3	Conduct an audit of HVAC systems in all existing COEG buildings and develop a schedule for end of useful life replacement of outdated systems with high-efficiency models, including features like variable refrigerant flow (VRF) systems and appropriately placed smart thermostats, and implementing regular maintenance to ensure optimal performance.	PW	N/A	$12,970	General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
FEC-1.2	Develop an employee carpool matching system that is integrated into COEG's intranet, which would allow employees to input their commute details and preferences and match them with suitable carpool partners. Provide incentives for regular use of the system, including COEG merchandise, or small quarterly stipends.	CM	N/A	$46,314	Gas Tax, Measure A, Special Funds, SWCC/Fund 506
FEC-1.3	Partner with SacRT to establish a program offering monthly public transit passes to COEG employees.	CM	SacRT	$539,807	Gas Tax, Measure A, General Fund, Special Funds, SWCC/Fund 506
FEC-1.4	Establish a guaranteed ride home program that provides rides for COEG employees in the form of vouchers for rideshare or taxi services up to a certain number of times per year. The program would be intended for employees who use more sustainable transportation modes for their commute, such as public transit, carpooling, biking, or walking, and would prevent employees from being stranded in the event of public transit schedule changes, damage to their bicycle, or other unexpected situations.	CM	N/A	$93,558	Gas Tax, Measure A, General Fund, Special Funds, SWCC/Fund 506
FEC-1.5	Conduct a review of COEG buildings and facilities to identify opportunities to increase amenities that encourage biking, such as bicycle parking/storage, shelters, end-of-trip facilities (e.g., repair stands, bicycle wash stations, showers, locker rooms), and electric bicycle charging infrastructure.	CM, PW	N/A	$62,900	Gas Tax, Measure A, General Fund
FEC-1.6	Launch an annual VMT reduction challenge for COEG employees, which would encourage departments or teams to compete in reducing their collective VMT over a set period each year by offering prize incentives for the winning team(s).	CM	N/A	$46,399	Gas Tax, Measure A, Special Funds, SWCC/Fund 506
FEC-1.7	Establish an e-bike lending library for COEG employees to use as an alternative to vehicle use for intracity travel during work hours.	CM, FI	N/A	$44,121	Gas Tax, Measure A, Special Funds, SWCC/Fund 506
FEC-1.8	Develop and implement an incentive program for COEG employees who purchase a bike/e-bike for their commute (e.g., walking, biking). Incentives may include COEG merchandise, reimbursement up to a specified amount for the purchase of a bike/e-bike, or other benefits that are correlated with the number of days commuted using active transportation modes.	CM	N/A	$360,272	Gas Tax, Measure A, General Fund, Special Funds, SWCC/Fund 506

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RS-1.1	Conduct an updated, comprehensive climate change vulnerability assessment specific to COEG's physical assets (e.g., buildings, facilities) and planned Capital Improvement Program projects, and based on findings, develop a prioritized list of COEG assets requiring climate adaptation interventions.	PW	N/A	$11,293	General Fund
RS-1.4	Develop a policy mandating the consideration of future climate projections in Capital Improvement Program projects that includes a checklist of resilience measures to be considered for different types of projects (e.g., buildings, roads, parks).	CM, PW	N/A	$21,805	General Fund
RS-1.6	Plant shade trees and add other heat-mitigating amenities around COEG buildings and facilities, such as reflective pathway surfaces, more shaded seating areas, hydration stations, and misters, among other amenities.	PW	N/A	$267,487	General Fund
WW-1.1	Develop and implement a plan to gradually replace water-intensive landscaping (e.g., turfgrass that is not intended for recreational use) at COEG and CCSD-managed facilities and parks with native, drought-tolerant plants and/or permeable hardscaping, which should include a phased and prioritized implementation schedule. As part of plan implementation, update COEG's landscape guidelines to reflect appropriate planting and maintenance guidance for drought-tolerant landscaping.	PW	CCSD PR	$2,327,709	General Fund
WW-2.2	Increase recycling and organic waste diversion at all COEG buildings and facilities by inventorying and identifying needs for additional recycling and food waste bins and appropriate signage and education opportunities (e.g., regular staff presentations, mini workshops) to inform/educate employees and the public on proper waste disposal and recycling.	PW	Republic	$50,975	Enterprise Fund
WW-2.3	Institutionalize a sustainable events policy that requires zero waste at events hosted by COEG.	CM, PW	N/A	$43,067	General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
Midterm					
BF-3.2	Phase in the installation of a building energy management system (BEMS) in COEG buildings and facilities that provides real-time monitoring and control of energy usage, allowing for optimization of heating, cooling, and lighting systems. Each BEMS will include smart sensors, automated controls, and data analytics capabilities to identify energy-saving opportunities. Phasing should start with the largest energy-consuming buildings and facilities and gradually expand to all facilities. Include required training and technical support to properly use each system.	PW, CM	N/A	$225,276	General Fund
BF-3.4	Establish a retro-commissioning program for all existing COEG buildings, which encompasses a systematic process to identify and implement operational and maintenance improvements, and aims to optimize building systems, reduce energy consumption, improve occupant comfort, and extend equipment life.	PW	N/A	$11,293	General Fund
FEC-2.2	Develop a policy to require greater use of low- and zero-emission off-road vehicles and encourage electric equipment (e.g., landscaping, construction) for City-owned equipment, City-funded projects, and City contractors.	PW	SMAQMD, CCSD PR	$39,721	General Fund
RS-1.2	Develop a policy that establishes heat-resilient building standards for all new COEG construction and major renovations, which addresses aspects such as green/cool roofs, enhanced insulation, and passive cooling design elements.	PW, CM	N/A	$11,293	General Fund
RS-1.3	Retrofit existing COEG buildings and facilities to improve their resilience to climate hazards, such as extreme heat and extreme precipitation. Determine and implement solutions that are tailored and feasible for each building or facility.	PW	N/A	$11,293	General Fund
RS-1.5	Install cooling strategies and/or permeable pavement on COEG parking lots to help reduce the urban heat island effect and provide additional flood protection, prioritizing permeable pavement in lots or areas that are more flood prone. Test different types of cool and permeable pavement materials, and based on results, develop guidelines for broader implementation throughout the city.	PW	SMAQMD	$1,719,820	General Fund

Strategy Number	Action	Implementing Department(s)	Community Partner(s)	Implementation Cost (FY 25/26 – FY 29/30)	Funding Source(s)
RS-1.7	Implement rigorous preventive maintenance schedules for all COEG infrastructure to enhance their longevity, bolster their resilience, and reduce the need for new materials (i.e., for premature repairs and replacement).	PW	N/A	$11,293	General Fund
WW-1.3	Conduct periodic water use audits for all COEG buildings and facilities, which will help to identify leaks, inefficient fixtures, and opportunities for water reuse. Based on annual audit results, develop a list of water-saving upgrades and needed operational changes.	PW	N/A	$39,908	General Fund
WW-2.1	Conduct a review of existing COEG procurement and operational practices and adopt practices that further avoid the generation of waste, such as using reusable materials, compostable products, and reduced packaging. Additionally, develop training for COEG employees on sustainable purchasing, procurement, and operations to maximize avoidance of waste generation, and conduct periodic waste audits to measure the success of existing efforts and inform potential changes to policies or procedures, as necessary.	FI, PW	N/A	$10,974	General Fund
WW-2.4	Adopt a policy that requires minimum recycled content in construction materials for COEG construction and maintenance projects, and includes the development of a preferred materials list. Regularly update the policy to reflect advancements in recycled material technology and availability.	PW, CM, CD	N/A	$85,797	General Fund
Long Term					
WW-1.2	Upgrade all COEG- and CCSD-managed irrigation systems to smart, weather-based systems that use real-time weather data and soil moisture sensors to optimize watering schedules and reduce overwatering, and develop a maintenance and monitoring program to ensure long-term efficiency.	PW	CCSD PR	$0[1]	N/A

Notes: FY = fiscal year; N/A = not applicable.

1 Costs associated with implementing Action WW-1.2 has not been estimated because the action is not contemplated to begin within the next five fiscal years.

5.3 CEQA

CEQA requires public agencies to identify significant environmental impacts of new development and future projects, including those related to GHG emissions, and avoid or mitigate those impacts when feasible. The *Climate Compass* includes several strategies and actions intended to reduce GHG emissions from new development and other projects.

In preparation for the *Climate Compass*, a Subsequent Environmental Impact Report (SEIR) was prepared to evaluate the potential environmental impacts anticipated with the implementation of strategies. This programmatic environmental review establishes the foundation for subsequent streamlined review of individual projects.

CEQA Qualification for Streamlining

The Climate Compass has been designed to qualify as a "plan for the reduction of greenhouse gas emissions" under CEQA Guidelines Section 15183.5(b)(1). When a plan meets these qualifications, it enables a streamlined CEQA review process for GHG emissions from future projects that are consistent with the Climate Compass.

This streamlining approach allows later projects to use the comprehensive GHG analysis already completed for the *Climate Compass*, rather than conducting their own detailed GHG studies. This saves time and resources while ensuring consistent application of climate solutions across the city. By balancing environmental protection with efficient development processes, Elk Grove can achieve its climate goals while supporting continued growth.

Table 5-5 demonstrates how the *Climate Compass* meets the criteria for CEQA streamlining. Future projects that are consistent with the Elk Grove General Plan and *Climate Compass* are therefore eligible to tier from the SEIR's programmatic analysis of GHG emissions.

Table 5-5 Climate Compass Compliance with Elements of CEQA Qualified Plan for the Reduction of GHG Emissions

Elements of a Plan for the Reduction of Greenhouse Gas Emissions [CEQA Guidelines 15183.5(b)(1)]	*Climate Compass* Compliance with Elements
(A) Quantify greenhouse gas (GHG) emissions, both existing and projected, over a specified period of time, resulting from activities within a defined geographic area.	The Climate Compass is based on the City of Elk Grove's 2021 inventory of existing GHG emissions, and forecasts for 2030 and 2045, for both community-wide activities and City operations. GHG emissions for all years include emissions associated with activities occurring within the City of Elk Grove boundaries. The inventories and forecasts were prepared pursuant to the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol) version 1.2 (July 2019) developed by Local Governments for Sustainability (ICLEI) and the ICLEI Local Government Operations Protocol (LGO Protocol), version 1.1 (May 2010) developed by ICLEI. Further, the inventories and forecasts include sources over which the City has some level of jurisdictional control or influence (such as building energy use) and exclude those sources over which the City has no jurisdictional control or influence. ▶ Chapter 2: Greenhouse Gas Reduction Strategy contains a summary of the GHG emissions inventory and forecasts. ▶ Appendix A: Greenhouse Gas Emissions Inventory. ▶ Appendix B: Greenhouse Gas Emissions Forecasts.

Elements of a Plan for the Reduction of Greenhouse Gas Emissions [CEQA Guidelines 15183.5(b)(1)]	*Climate Compass* Compliance with Elements
(B) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.	The *Climate Compass* establishes 2030 and 2045 targets for the reduction of GHG emissions in alignment with legislative targets for statewide emissions reductions and CARB's 2022 Scoping Plan. The *Climate Compass* GHG emissions reduction targets align with the statewide emissions trajectory to meet the 2045 target of 85 percent below 1990 levels, pursuant to AB 1279. Consistency with the 2022 Scoping Plan and AB 1279 are appropriate metrics by which to determine the significance of the Climate Compass's GHG emissions through 2045. As explained in CEQA Guidelines Section 15064.4(b)(3), a lead agency "may consider a project's consistency with the state's long-term climate goals or strategies" when determining the significance of a project's cumulative GHG emissions impacts. Therefore, the *Climate Compass's* 2030 target represents the level below which GHG emissions would not be cumulatively considerable in the year 2030. ▶ Chapter 2: Greenhouse Gas Reduction Strategy contains a summary of the GHG emissions reductions targets for 2030 and 2045. ▶ Appendix C: Community Strategies and Actions.
(C) Identify and analyze the GHG emissions resulting from specific actions, or categories of actions anticipated within the geographic area	The *Climate Compass's* inventory of existing GHG emissions and emissions forecasts accounts for existing and future changes from on-road and off-road transportation, building energy (includes residential and nonresidential), solid waste, water, wastewater, and agriculture. The forecasts of future emissions analyze how existing emissions are expected to change over time under a business-as-usual scenario and an adjusted business-as-usual scenario that accounts for state and federal legislative reductions. The *Climate Compass* identifies 21 strategies and numerous implementing actions to reduce GHG emissions within the City of Elk Grove to achieve the 2030 and 2045 targets for community-wide GHG emissions. Additionally, the *Climate Compass* identifies municipal strategies and numerous implementing actions to reduce City government operations emissions to achieve the 2030 and 2045 targets for government operations. ▶ Chapter 2: Greenhouse Gas Reduction Strategy contains a summary of the GHG emissions inventory and forecasts. ▶ Appendix C: Community Strategies and Actions.
(D) Specify strategies or a group of strategies, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level	The *Climate Compass* sets forth a package of strategies and actions presents analysis demonstrating that their collective implementation would achieve the 2030 and 2045 targets established in the *Climate Compass*. The *Climate Compass* also identifies how, if these measures were implemented on a project-by-project basis, the measures collectively would achieve the 2030 and 2045 targets. The *Climate Compass* includes a preponderance of mandatory (versus voluntary) strategies and actions, strategies that address the largest GHG emissions sources (such as building energy use and transportation), a focus on core measures that are likely to reduce large amounts of emissions, transparency in methods of quantification, and no reliance on voluntary carbon offsets. ▶ Chapter 3: Climate Action Strategies contains a description of all GHG reduction measures and their associated implementing actions, including a summary of quantitative GHG emissions reduction estimates for each reduction strategy. ▶ Appendix C: Community Strategies and Actions.

Elements of a Plan for the Reduction of Greenhouse Gas Emissions [CEQA Guidelines 15183.5(b)(1)]	*Climate Compass* Compliance with Elements
(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels.	The *Climate Compass* includes a detailed plan for implementing, monitoring, and reporting on the *Climate Compass*, including how the *Climate Compass* will be updated periodically, that will evaluate the effectiveness of *Climate Compass* measures and actions and include regular emissions inventory updates to ensure the City is on track to meet the GHG reduction targets. The implementation plan also includes details regarding funding and financing options and a list of available and expected funding sources, along with a table for monitoring and reporting progress on the measures and their implementing actions. The City will prepare annual GHG emissions inventory updates. ▶ Chapter 5: Implementation and Monitoring. ▶ Climate Compass dashboard: elkgrove.gov/cap ▶ Appendix F: Implementation Cost Analysis.
(F) Be adopted in a public process following environmental review.	The City has prepared a Subsequent Environmental Impact Report (SEIR) to evaluate the environmental effects of *Climate Compass* Implementation. The SEIR will be circulated for a 45-day public review and comment period, along with the Public Draft *Climate Compass*. The City Council will consider whether to certify the SEIR and adopt the *Climate Compass* at a public hearing. ▶ The SEIR will be available for review on the City's website: elkgrove.gov/cap

5.4 MONITORING

Tracking progress is essential to successful implementation. The City will regularly evaluate the effectiveness of each action in achieving targeted GHG reductions, ensuring accountability, transparency, and the ability to adjust as needed.

CIS will coordinate monitoring activities across departments, tracking both implementation status and performance outcomes using ClearPath 2.0. This comprehensive climate planning platform integrates quantitative emissions modeling with action tracking and reporting capabilities. The *Climate Compass* identifies specific key performance indicators (KPIs) for each strategy to establish measurable benchmarks for evaluating progress and reporting over time.

ClearPath 2.0 offers three core monitoring functions:

- **Implementation Status:** Tracks the real-time progress of measurable strategies, enabling City staff to update status indicators from planning through completion.
- **Performance Monitoring:** Connects implementation with measurable outcomes by calculating actual emissions reductions achieved. As City staff input annual activity data, ClearPath 2.0 automatically adjusts the future trajectory of emissions reductions needed to meet emission targets.
- **Transparent Information Sharing:** Makes emission reduction progress visible to everyone through an accessible online dashboard. Community members can explore interactive visualizations showing emissions trends, progress on specific actions, and the collective impact of climate initiatives without needing technical expertise.

5.5 REPORTING

City staff will provide regular updates on implementation status and performance monitoring through the ClearPath 2.0 *Climate Compass* dashboard at: elkgrove.gov/cap.

CIS will prepare annual progress reports for presentations to the City Council. These reports will summarize GHG inventory updates, strategy implementation status, and recommendations for addressing implementation challenges. Each report will also include performance data tied to the metrics and KPIs. Annual reporting is especially effective for tracking ongoing, near-term, and midterm actions, helping to ensure accountability and enable timely course corrections.

It is recommended that a comprehensive update be conducted every five years following *Climate Compass* adoption. This will evaluate the overall effectiveness, inform necessary adjustments, and assess the feasibility and progress of long-term actions identified in the *Climate Compass*, ensuring the plan remains relevant and aligned with Elk Grove's climate goals.

5.6 ONGOING ENGAGEMENT

Successful implementation, monitoring, and reporting of the *Climate Compass* will rely on regular community engagement and active participation after adoption. Residents, businesses, community groups, developers, property owners, and partner agencies will all play key roles in driving action and helping achieve mitigation and adaptation goals. As outlined in the implementation plans above, numerous actions require strong partnerships and active involvement from the broader community.

The City is committed to ongoing outreach to keep the community informed and provide meaningful opportunities for participation throughout implementation. Efforts may include addressing barriers such as limited access to technology or language differences to ensure equitable engagement, especially for underserved communities. This approach helps build trust, promote inclusivity, and ensure all voices are reflected in the implementation process.

To keep the community informed, the City will conduct regular outreach to highlight the benefits of climate action and connect residents with tools and resources that support sustainable choices. Efforts may include awareness campaigns, multilingual educational materials, and public events designed to meet people where they are. The Climate Ambassador program, introduced in **Chapter 1**, will continue during implementation as a key strategy for amplifying community voices, fostering sustainability conversations, and gathering feedback on progress.

The community will also be able to engage digitally through the ClearPath 2.0 *Climate Compass* dashboard. This tool will track GHG reductions, assess climate risks, and visualize the impact of implemented actions in real time. By aligning performance data with public feedback, ClearPath 2.0 will empower communities to see the results of their contributions and validate their perspectives with measurable outcomes.

Through a collaborative approach, the *Climate Compass* will remain a dynamic roadmap grounded in a shared vision for a sustainable and resilient Elk Grove.

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CHAPTER 6

WORKS CITED

Chapter 6
Works Cited

INTRODUCTION

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CLIMATE STRATEGIES

No references were cited in this chapter.

CITY OPERATIONS

No references were cited in this chapter.

IMPLEMENTATION AND MONITORING

No references were cited in this chapter.

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Appendix A

Greenhouse Gas Emissions Inventory

Memo

455 Capitol Mall, Suite 300
Sacramento, CA 95814
916.444.7301

Date: November 1, 2023

To: Christopher Jordan and Carrie Whitlock (City of Elk Grove)

From: Lisa Fenton, Hannah Kornfeld, Brenda Hom, and Honey Walters (Ascent)

Subject: City of Elk Grove Climate Compass: Final Greenhouse Gas Inventory Update Technical Memorandum

1 INTRODUCTION

The City of Elk Grove (City) is updating its Climate Action Plan (CAP) to provide a comprehensive and transformative framework for both mitigating and adapting to climate change while also supporting the City's broader sustainability and resilience goals. The CAP was last comprehensively updated in 2019. This technical memorandum (memo) describes the major greenhouse gas (GHG) emission sources and activities for community and City operations (i.e., municipal operations) in the year 2021 and is the first step in the climate action planning update process. The community and City operations GHG inventories will be used to inform the ***Climate Compass:*** *A Plan for Implementing Elk Grove's Climate, Sustainability, and Resilience Goals* (Climate Compass), the update to the City's CAP. The Climate Compass will serve as a roadmap for reducing local GHG emissions across various sectors while building resilience to future impacts posed by climate change.

1.1 INVENTORY PURPOSE AND DESCRIPTION

The first step in a city's climate action planning process is to develop a GHG emissions inventory, which is a snapshot of the emissions associated with activities within its jurisdiction in a given year. The purpose of an inventory is to:

- establish a baseline against which future emissions levels and future reduction targets can be measured,
- understand the sectors and sources generating GHG emissions and their relative contribution to total emissions, and
- monitor progress towards achievement of GHG reduction targets.

Preparing a GHG emissions inventory is a critical step in climate action planning. To develop and implement a plan that will effectively reduce GHG emissions, local governments must first have a comprehensive understanding of the emissions that are generated by activities within their jurisdictions. GHG emissions inventories not only serve to provide this knowledge, but they also act as the basis for measuring progress and provide agencies with a framework to track emissions over time and assess the effectiveness of actions taken to reduce emissions. Additionally, local governments often prepare inventories to exhibit accountability and leadership, motivate community action, and demonstrate compliance with regulations.

An inventory estimates GHG emissions generated from activities occurring within a defined geographic boundary during a single year. It identifies the sources, and associated sectors, that are producing these emissions and the relative contribution of each, while also providing a baseline to forecast emissions trends into the future. This information is used to set reduction targets that are consistent with State and/or local objectives and then identify local measures for reducing GHG emissions as part of a jurisdiction's climate action plan.

1.2 ORGANIZATION OF THIS MEMO

This memo consists of the following main sections:

- Section 2: Inventory Overview outlines considerations for preparing community and City operations GHG emissions inventories, summarizes industry-leading protocols and methods for inventories, discusses inventory boundaries, and describes the emissions sectors and sources that are included and excluded in the community GHG emissions inventory.
- Section 3: Data, Methods, and Assumptions describes the data, methods, and assumptions used in the community and City operations inventories and presents GHG emissions estimates by sector.
- Section 4: Summary of Results provides a high-level summary of community and City operations GHG emissions estimates for 2021 and compares the 2021 year to the previously surveyed 2013 community inventory and the 2019 City operations inventory.

2 INVENTORY OVERVIEW

2.1 CONSIDERATIONS FOR DEVELOPING AN INVENTORY

Nations, states, local jurisdictions, public agencies, and corporations estimate GHG emissions for different purposes. Several general approaches exist to quantify GHG emissions, and the method chosen by governments or private entities is driven by the purpose for developing an inventory. State, federal, and international agencies have developed industry protocols and recommendations for local governments preparing GHG emissions inventories at the community level.

2.1.1 Production-based Inventories

The GHG emissions inventory approach generally used by local governments in the climate action planning process, known as a "production-based" inventory, estimates GHG emissions generated by activities occurring within a defined boundary during a single year. This has become the standard approach recommended by industry protocols and includes emissions that are generated from community activities that occur within the jurisdictional boundary of the inventory, such as those emitted from natural gas furnaces used for heating buildings throughout a community. It also includes certain "trans-boundary" emissions that are associated with activities occurring within the inventory's boundary but are released into the atmosphere outside of the boundary. For example, electricity emissions in a production-based inventory are attributed to a community based on electricity consumption within the inventory boundary, even if the electricity was generated and produced GHG emissions outside of the inventory boundary.

This memo addresses how inventories of the city's emissions from community activities and City operations were developed using a production-based approach. This is consistent with recommendations and guidance from industry protocols (described further in Section 2.2), and State agencies, including the California Air Resources Board (CARB) and the Governor's Office of Planning and Research (OPR). Production-based inventories provide local governments with the information needed to develop effective climate action policy within their communities; because of this, the production-based inventory method is the most common approach taken by local governments across California and the nation.

2.2 PROTOCOLS AND METHODOLOGIES

2.2.1 Protocols for Accounting and Reporting of Greenhouse Gas Emissions

Several inventory protocols have been developed to provide guidance for communities and local governments to account for emissions accurately and consistently. ICLEI – Local Governments for Sustainability (ICLEI) develops protocols for local-scale accounting of emissions that have become the industry standard for local governments developing GHG emissions inventories.

The most recent guidance for community-scale emissions inventories is ICLEI's July 2019 publication *US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions* (Community Protocol), Version 1.2 (ICLEI 2019). State agencies, including CARB and OPR, recommend that jurisdictions prepare community GHG emissions inventories using the guidelines included in the Community Protocol (CARB 2017:100; OPR 2017:226).

The Community Protocol identifies six principles for GHG accounting and reporting. These principles were adapted from internationally recognized sources and were used to guide the development of the Community Protocol. ICLEI recommends that local governments consider the principles when preparing an inventory. The GHG accounting and reporting principles are summarized below.

- Relevance, Including Policy Relevance, and Utility for Users: The ultimate objective and intent of an inventory should be considered during the inventory development process. Inventories should be organized in a way that is understandable and useful for policy makers and the public while appropriately reflecting community GHG emissions and enabling the evaluation of emissions trends over time.
- Accuracy: The use of GHG emissions accounting methods that are expected to systematically under- or over-estimate emissions should be avoided. Decisionmakers should be able to act with reasonable assurance as to the integrity of emissions estimates.
- Completeness: Community GHG emissions inventories should be as comprehensive as possible and include all emissions associated with the community, as well as community GHG emissions "sinks" (i.e., the opposite of an emissions source; any reservoir, natural or otherwise, that accumulates and stores GHG emissions)[1].
- Measurability: Methods used to quantify GHG emissions should be readily available, adequately substantiated and of known quality, and updated regularly as established methods evolve.
- Consistency and Comparability: Community inventories should consistently use preferred, established methods to enable tracking of emissions over time, evaluation of reduction measures effectiveness, and comparison between communities. Alternative methods should be documented and disclosed.
- Transparency: All relevant data sources, methods, and assumptions should be disclosed and described to allow for future review and replication. Similarly, all relevant issues should be documented and addressed coherently.

Consistent with the above principles, as well as industry standards and best practices, the City's inventory of GHG emissions from community activities primarily follows methodologies provided by the Community Protocol. It also follows methodologies from CARB for certain sectors and sources not included in the Community Protocol.

ICLEI has also developed guidance to assist local governments in conducting inventories of emissions from their municipal operations. The City's municipal operations inventory follows methodologies from ICLEI's latest technical guidance in its May 2010 publication *Local Government Operations Protocol (LGOP) for the Quantification and Reporting of Greenhouse Gas Emissions Inventories* (ICLEI 2010).

2.2.2 California Air Resources Board Methods

Each year, CARB develops and publishes the California GHG Emission Inventory Data for emissions statewide in California. CARB follows Intergovernmental Panel on Climate Change (IPCC) guidelines for national reporting, and its overarching approach and many of its methods align with the Community Protocol. As climate change science and GHG emissions accounting practices have evolved, CARB has implemented additional methodologies for certain emissions sectors and sources that are not included in the Community Protocol.

The inventory is aligned with the CARB inventory as much as possible. Consistency with the State's methodologies and approaches will be beneficial for upcoming phases of the Climate Compass development process, including estimating projected GHG emissions in the future (i.e., forecasting emissions), setting GHG emissions reduction targets, and measuring progress towards established targets.

The City's inventories use methods provided by CARB and the California GHG Emission Inventory for several emissions sectors and sources. For example, although the Community Protocol recommends using the US Environmental Protection Agency's (EPA) NONROAD model, emissions from off-road vehicles and equipment in the city were obtained from CARB's OFFROAD model, which provides more geographic-specific emissions estimates for California using the best available data.

[1] This GHG emissions inventory and the City's Climate Compass focus on emissions sources; they do not incorporate an analysis of emissions sinks.

2.3 EMISSIONS SECTORS AND SOURCES

There are several approaches for categorizing and grouping GHG emissions in inventories. Generally, community GHG emissions are organized into emissions sectors, which typically include:

- Building energy
- Transportation
- Solid waste
- Water
- Wastewater

Sometimes, community sectors are broken down further, such as residential building energy and nonresidential building energy, and sectors may also be combined, such as water and wastewater. Local governments may also include additional relevant sectors, such as agriculture.

Municipal GHG emissions are also organized into emissions sectors, which typically include:

- Building and facilities
- Streetlights and traffic signals
- Employee commute
- Vehicle fleet
- Solid waste
- Water supply
- Wastewater treatment

The purpose of categorizing GHG emissions into broad sectors is to provide local governments and the public with a useful organization of community emissions. Importantly, GHG emissions sectors may not align directly with economic sectors (e.g., hospitality), but there may be overlap for some communities.

Within GHG emissions sectors, emissions are generated in a variety of ways. For example, motor vehicles burn fossil fuels and emit GHGs directly into the atmosphere; the electricity used in homes and businesses produces indirect emissions from power plants; and solid waste that ends up in landfills breaks down and releases GHG emissions over time. The Community Protocol organizes different types of community GHG emissions into two general categories:

- GHG emissions **sources** are those that release emissions directly into the atmosphere as a result of any physical process that occurs within the jurisdictional boundary of the inventory. Natural gas combustion for heating in homes and diesel fuel combustion in motor vehicles within the community are examples of GHG emissions sources.
- GHG emissions **activities** are those that release emissions into the atmosphere either directly or indirectly as a result of the use of energy, materials, and/or services within the community. For example, GHG emissions from a community's electricity use are accounted for and considered GHG emissions activities, even if the burning of fossil fuels to generate the electricity occurred and produced emissions outside of the inventory boundary.

For the sake of clarity, this memo uses "GHG emissions sources" to represent both direct in-boundary emissions *sources* as well as indirect emissions that are produced out-of-boundary as a result of *activities* that occur within the community. The GHG emissions sources in the City's community inventory are organized under seven sectors: building energy, on-road transportation, off-road vehicles and equipment, solid waste, water supply, wastewater treatment, and agriculture. The GHG emissions sources in the City's municipal inventory are organized under eight sectors: buildings and facilities, streetlights and traffic signals, employee commute, vehicle fleet, solid waste, water supply, wastewater treatment, and process and fugitive.

2.3.1 Community Protocol-Compliant Sources

When developing a community inventory, it is important for local governments to determine what will be included in the inventory scope. This may be influenced by factors such as the purpose and intended narrative of the inventory, the reporting framework that will be used, and the GHG emissions sources present in the community. While local governments have some flexibility in determining an inventory's scope, the Community Protocol requires the inclusion of a minimum of five emissions sources in community inventories:

1. Use of electricity by the community.
2. Use of fuel in residential and commercial stationary combustion equipment.
3. On-road passenger and freight motor vehicle travel.
4. Use of energy in potable water and wastewater treatment and distribution.
5. Generation of solid waste by the community.

The Community Protocol strongly encourages local governments to include other emissions-generating sources in accounting and reporting as well. Considerations for including additional sources are outlined in the following section.

2.3.2 Additional Sources

Many local governments go beyond the minimum requirements of the Community Protocol. Beyond the five emissions sources required by the Community Protocol, the additional GHG emissions sources included in a community inventory are determined by the jurisdiction conducting the inventory. The Community Protocol recommends the Local Government Significant Influence reporting framework, where local governments account for all emissions sources over which they have authority or significant influence. The additional sources included in the community inventory are off-road vehicles, and equipment and agriculture. This approach benefits the overall climate action planning process because it emphasizes the emissions sources that the local government has the greatest ability to address (ICLEI 2019:29).

2.4 BOUNDARIES

The scope and boundary chosen for estimating GHG emissions may vary depending on the focus and/or intent of the inventory. For example, while corporate inventories use the concept of ownership to guide GHG emissions accounting—where emissions generated by all sources and activities owned by the entity are accounted for, regardless of where emissions are produced—community-scale inventories serve to convey information about emissions associated with politically defined communities (ICLEI 2019:12).

As described in the previous sections, production-based community inventories include emissions that are produced within a community's geographic boundary as well as those that are produced outside the boundary but result from activities within the community. Regardless of location within or outside of a community's boundary, upstream emissions generated by the consumption of goods and services are excluded from production-based inventories. Inventories following the Community Protocol are required to include several emissions sources; however, certain emissions sources that are located within the inventory boundary may be excluded from a community inventory. The following section outlines considerations and the decision-making framework for determining what GHG emissions sources are included or excluded from an inventory.

2.4.1 Inventory Boundaries

The Climate Compass aims to reduce GHG emissions from sources within the city for which the City has operational control, regulatory authority, or significant influence. As a result, the City's inventories include emissions generated from activities that occur within the boundaries of the city and over which the City has operational control, regulatory authority, or significant influence. The inventories do not include emissions generated from activities located within the city's boundary but outside of its jurisdiction, as the City does not have operational control, regulatory authority,

or significant influence over these emissions sources. For example, industrial facilities regulated by California's Cap-and-Trade program are overseen by the State and are therefore not included in the inventory. In Elk Grove, this would include the Carson Cogeneration Project.

The GHG emissions sectors and sources included and excluded in the 2021 community and City operations inventories are presented in Table 1. Additionally, Table 1 identifies the protocol that provided the methodology for estimating GHG emissions from each emissions source. Emissions sources that identify multiple protocols used a combination of data and methods from multiple protocols. For example, off-road vehicles and equipment calculations used methods consistent with IPCC and the Community Protocol but substitute California-specific data obtained from CARB for less geographic-specific data provided by the protocols.

Table 1 2021 Elk Grove Summary of Sectors and Sources in Community and City Operations Inventories

Sector/Source	Included	Excluded	Protocol(s)
Community Inventory			
On-Road Transportation			
On-Road Transportation	Emissions from 100 percent of vehicle trips within the city (internal-internal) and 50 percent of vehicle trips starting or ending outside the city (internal-external and external-internal)	Emissions from 100 percent of pass-through vehicle trips starting and ending outside the city (external-external)	Community Protocol
Building Energy			
Electricity	Emissions associated with all electricity consumed within the city	NA	Community Protocol
Natural Gas	Emissions from natural gas consumed within the city	NA	Community Protocol
Backup Generators	Emissions from diesel, natural gas, and gasoline consumed in backup generators within the city	NA	Community Protocol
Solid Waste			
Community-Generated Solid Waste	Emissions from all waste generated within the city	NA	ClearPath
Composting	Emissions from compost generated within the city	NA	CARB
Off-Road Vehicles and Equipment			
Off-Road Vehicles and Equipment	Emissions from off-road vehicles and equipment within the city	NA	Community Protocol/CARB
Wastewater Treatment			
Wastewater Treatment	Emissions associated with wastewater generated within the city	NA	Community Protocol
Water Supply			
Water Supply	Emissions associated with water use within the city	NA	Community Protocol
Agriculture			
Livestock Management	Emissions associated with manure management practices and enteric fermentation from livestock within the city	NA	Community Protocol
Fertilizer Application	Emissions associated with fertilizer use within the city	NA	CARB/IPCC
Agricultural Equipment – Off-Road Vehicles and Equipment	Emissions from agricultural off-road vehicles and equipment within the city	NA	Community Protocol/CARB

Sector/Source	Included	Excluded	Protocol(s)
Agricultural Building Energy	Emissions associated with all electricity consumed from agricultural operations within the city	NA	Community Protocol
City Operations Inventory			
Buildings and Facilities			
Electricity	Emissions associated with electricity consumed from City operations	NA	LGOP
Natural Gas	Emissions from natural gas consumed from City operations	NA	LGOP
Backup Generators	Emissions from diesel consumed in backup generators from City facilities	NA	LGOP
Streetlights and Traffic Signals			
Electricity	Electricity used for streetlights and traffic signals within the city	NA	LGOP
Employee Commute			
VMT	VMT from City employee commute trips	NA	LGOP
Vehicle Fleet			
VMT	VMT from City owned and operated on-road vehicles	NA	LGOP
Solid Waste			
Solid Waste Disposed	Emissions from all waste generated by City facilities	NA	ClearPath
Composting	Emissions from compost generated by City facilities	NA	CARB
Wastewater Treatment			
Wastewater Treatment	Emissions associated with wastewater generated by City facilities	NA	LGOP
Water Supply			
Water Supply	Emissions associated with water use from City facilities	NA	LGOP
Process and Fugitive			
Process and Fugitive	Emissions associated with leakage in the local natural gas distribution system	NA	ClearPath

Notes: CARB = California Air Resources Board; Community Protocol = US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions; IPCC = Intergovernmental Panel on Climate Change; LGOP = Local Government Operations Protocol; NA = not applicable; VMT = vehicle miles traveled.

Source: Compiled by Ascent in 2023.

3 DATA, METHODS, AND ASSUMPTIONS

3.1 OVERVIEW OF ACTIVITY DATA AND EMISSIONS FACTORS

The basic calculation for estimating GHG emissions involves two primary inputs: activity data and emissions factors. Activity data refer to the relevant measurement of an activity resulting in emissions, and emissions factors represent the amount of GHGs emitted on a per unit of activity basis. Emissions factors are applied to activity data (i.e., the two values are multiplied together) to estimate GHG emissions. For example, in the community residential energy sector, activity data of annual community electricity consumption in megawatt-hours (MWh) is multiplied by an emissions factor in pounds of GHG per MWh, which results in a pounds of GHG emissions value. This calculation-based methodology is used for estimating emissions from most sources in the City's production-based inventories. An overview of activity data and emissions factors for each emissions source, along with data sources, is shown in Table 2. Detailed methods are described in the following sections.

Table 2 2021 Elk Grove Summary of Activity Data and Emissions Factors

Sector/Source	Input Type	Description and Data Sources
Community		
On-Road Transportation		
On-Road Transportation	Activity data	VMT data from Fehr & Peers
	Emissions factor	Sacramento County-specific emissions factors from CARB
Building Energy		
Electricity	Activity data	Electricity consumption data from SMUD
	Emissions factor	Utility-specific emissions factor from TCR and EPA
Natural Gas	Activity data	Natural gas consumption data from PG&E
	Emissions factor	Average emissions factors from TCR
Backup Generators	Activity data	Fuel consumption data from SMAQMD
	Emissions factor	Average emissions factors from TCR
Solid Waste		
Community-Generated Solid Waste	Activity data	Waste disposal data from the City
	Emissions factor	California-specific solid waste emissions factors from ClearPath
Composting	Activity data	Organic waste tonnage data from the City
	Emissions factor	Composting emissions factors from CARB
Off-Road Vehicles and Equipment		
Off-Road Vehicles and Equipment	Activity data	Off-road vehicles and equipment activity and emissions factors data from CARB
	Emissions factor	
Wastewater Treatment		
Wastewater Treatment	Activity data	Wastewater generation and process-related data from SRWTP and septic system data from SCPH
	Emissions factor	Emissions factors based on treatment processes from ICLEI
Water Supply		
Water Supply	Activity data	Electricity consumption data from EGWD and SCWA
	Emissions factor	Utility-specific emissions factors from TCR and EPA

Sector/Source	Input Type	Description and Data Sources
Agriculture		
Livestock Management	Activity data	Livestock population data from the 2021 Sacramento County Crop Report and US Department of Agriculture's 2017 Census of Agriculture
	Emissions factor	Emissions factors by applicable livestock type from CARB
Fertilizer Application	Activity data	CFDA 2021 Fertilizer Tonnage Report
	Emissions factor	Fertilizer emissions factors from CARB
Agricultural Equipment – Off-road Vehicles and Equipment	Activity data	Off-road vehicles and equipment activity data and emissions factors from CARB
	Emissions factor	
Agricultural Equipment – Irrigation Pumps	Activity data	Diesel-powered irrigation pump data from SMAQMD
	Emissions factor	Emission Factors from CARB
Agricultural Building Energy	Activity data	Electricity consumption data from SMUD
	Emissions factor	Utility-specific emissions factor from TCR and EPA
City Operations		
Buildings and Facilities		
Electricity	Activity data	Electricity consumption data from SMUD
	Emissions factor	Utility-specific emissions factor from TCR and EPA
Natural Gas	Activity data	Natural gas consumption data from PG&E
	Emissions factor	Average emissions factors from TCR
Backup Generators	Activity data	Fuel consumption data from SMAQMD
	Emissions factor	Average emissions factors from TCR
Streetlights and Traffic Signals		
Electricity	Activity data	Electricity use from streetlights and traffic signals from SMUD
	Emissions factor	Utility-specific emissions factor from TCR and EPA
Employee Commute		
VMT	Activity data	Employee commute data from the City
	Emissions factor	Sacramento County-specific emissions factors from CARB
Vehicle Fleet		
VMT	Activity data	VMT from the City
	Emissions factor	Sacramento County-specific emissions factors from CARB
Solid Waste		
Solid Waste Disposed	Activity data	Waste disposal tonnage data from the City
	Emissions factor	California-specific solid waste emissions factors from ClearPath
Composting	Activity data	Organic waste tonnage data from the City
	Emissions factor	Composting emissions factors from CARB
Wastewater Treatment		
Wastewater Treatment	Activity data	Wastewater generation and process-related data from SRWTP
	Emissions factor	Emissions factors based on treatment processes from ICLEI

Sector/Source	Input Type	Description and Data Sources
Water Supply		
Water Supply	Activity data	Electricity consumption data from EGWD and SCWA
	Emissions factor	Utility-specific emissions factors from TCR and EPA
Process and Fugitive		
Process and Fugitive	Activity data	Natural gas consumption data from PG&E
	Emissions factor	Default emissions factor's from ClearPath

Notes: CARB = California Air Resources Board; CEC = California Energy Commission; CFDA = California Department of Food and Agriculture; CPUC = California Public Utilities Commission; EGWD = Elk Grove Water District; EPA = US Environmental Protection Agency; ICLEI = ICLEI – Local Governments for Sustainability; PG&E = Pacific Gas & Electric; SCPH = Sacramento County Public Health; SCWA = Sacramento County Water Agency; SMAQMD = Sacramento Municipal Air Quality Management District; SMUD = Sacramento Municipal Utility District; SRWTP = Sacramento Regional Wastewater Treatment Plant; TCR = The Climate Registry; VMT = vehicle miles traveled.

Source: Compiled by Ascent in 2023.

3.2 GLOBAL WARMING POTENTIALS AND EMISSIONS UNITS

GHG emissions other than carbon dioxide (CO_2) are stronger insulators and, thus, have a greater ability to warm the Earth's atmosphere through the greenhouse effect. This effect is measured in terms of a pollutant's Global Warming Potential (GWP). CO_2 has a GWP factor of one while all other GHGs have GWP factors measured in multiples of one relative to the GWP of CO_2. This conversion of non-CO_2 gases to one unit enables the reporting of all emissions in terms of carbon dioxide equivalent (CO_2e), which allows consideration of all gases in comparable terms and makes it easier to communicate how various sources and types of GHG emissions contribute to climate change. The standard unit for reporting emissions is metric tons of carbon dioxide equivalent ($MTCO_2e$). Consistent with the best available science, these inventories use GWP factors published in the Sixth Assessment Report from IPCC, as shown in Table 3.

Table 3 GHG Global Warming Potential Factors

GHG	GHG Source Description	GWP_{100}
CO_2	All sources of CO_2	1
CH_4 (biogenic)	CH_4 from landfills and wastewater treatment	27.0
CH_4 (fossil - combustion)	CH_4 from combustion (vehicles, residential, commercial and industrial usage)	27.0
CH_4 (fossil – fugitive and process)	CH_4 from natural gas distribution leakage and natural gas production	29.8
N_2O	All sources of N_2O	273

Notes: GHG = greenhouse gas; GWP = Global Warming Potential; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide.

Source: IPCC 2023.

These values represent the GWP of a GHG on a 100-year time horizon. This means that methane (CH_4) is 27 and 29.8 times stronger than CO_2, depending on the source of methane, and N_2O is 273 times stronger than CO_2 in their potential to warm Earth's atmosphere over the course of 100 years. The use of 100-year GWP values is consistent with CARB methods and reflects the long-term planning horizon of the Climate Compass.

The GWP factor for methane depends on the source of methane. Methane emissions in the city mostly come from biogenic and fossil-combustion sources. Therefore, a GWP value of 27 is used for methane in the City's community and City operations inventories. The only exception to this is in the process and fugitive emissions sector of the City's municipal inventory where a methane value of 29.8 is used instead. This sector is not typically assessed in a community inventory but was included in the municipal inventory to compare to a previous municipal inventory.

3.3 DATA QUALITY AND ACCURACY

When preparing a GHG emissions inventory, the goal is to use the best available data and methodologies to develop the most accurate picture of a community's emissions. However, some degree of inaccuracy is inherent to all inventories. As described by the Community Protocol, "While no community inventory is fully comprehensive (some emissions cannot be estimated due to a lack of valid methods, a lack of emissions data, or for other reasons), community inventories often aim to provide as complete a picture of GHG emissions associated with a community as is feasible" (ICLEI 2019:12). The accuracy of a GHG emissions inventory is primarily dependent on activity data (e.g., tons of solid waste generated by a community), emissions factors (e.g., grams of CO_2 per vehicle mile traveled [VMT] in a county), and scaling factors (e.g., percentage of county-level off-road vehicles and equipment emissions attributed to a local jurisdiction). The year 2021 was chosen for the inventories because it is the most recent calendar year for which representative data are available.

Development of the City's GHG emissions inventories was a robust and comprehensive process rooted in industry standards and best practices, and it included extensive research and consultation with City staff and departments and regional and State agencies and organizations to obtain data that are as accurate as feasible. The City recognizes that even though its inventory is consistent with all protocols previously discussed and the data used are as accurate as feasible, perfect precision in emissions estimates is not possible at this time.

3.4 COMMUNITY INVENTORY DATA AND ASSUMPTIONS

3.4.1 Sector-Specific Assumptions and Methods

The following sections describe in detail the methods, data, and assumptions that were used in estimating the City's community GHG emissions in 2021. Population and employment data were used to scale activity levels for certain emissions sources and sectors. Population and employment data for 2021 were obtained from Fehr & Peers from the EGSIM20 model. The list below summarizes this information at a high level for each sector.

- Building Energy: Annual electricity and natural gas usage data for the city were provided by the Sacramento Municipal Utility District (SMUD) and Pacific Gas & Electric (PG&E). Utility emissions factors were provided by The Climate Registry (TCR) and EPA (see Tables 4 and 5). Annual nonresidential backup generator usage was provided by the Sacramento Metropolitan Air Quality Management District (SMAQMD). Emissions factors for nonresidential backup generator fuels were obtained from TCR.
- On-Road Transportation: For the on-road transportation sector, annual VMT data were obtained from Fehr & Peers using the EGSIM20 travel model. Vehicle emissions factors were derived from the 2021 EMissions FACtor (EMFAC2021) model, CARB's statewide mobile source emissions inventory model.
- Off-Road Vehicles and Equipment: Off-road vehicles and equipment emissions were estimated from CARB's OFFROAD2021 models and scaled by population, employment, or service population (i.e., the sum of population and employment) depending on the equipment type.
- Solid Waste: Emissions associated with waste and compost generated by residents and businesses in the city were estimated using disposal data available from the City. Landfill gas (LFG) collection information was available from EPA. Solid waste calculations were computed in ClearPath using California-specific solid waste emissions factors.
- Water Supply: Water supply emissions were estimated using electricity consumption data for electricity associated with water consumption. Data were provided by Elk Grove Water District (EGWD) and the Sacramento County Water Agency (SCWA). Water well data were also provided by the Sacramento County Public Health Department (SCPH).
- Wastewater Treatment: Emissions from wastewater treatment depend on the types of treatment processes and equipment that centralized wastewater treatment plants (WWTPs) use, as well as emissions from wastewater from septic systems. Data regarding treatment processes for the WWTP were provided by the Sacramento Regional Wastewater Treatment Plant (SRWTP) and septic system data were provided by SCPH.

- **Agriculture:** Emissions associated with the agriculture sector result from livestock management (i.e., enteric fermentation and manure management), fertilizer application, the operation of agricultural equipment (i.e., diesel-powered irrigation pumps and agricultural off-road vehicles and equipment), and building energy consumption from agricultural operations. Agriculture emissions were estimated using data available from CARB, SMAQMD, SMUD, Sacramento County, the California Department of Food and Agriculture (CDFA), and the US Department of Agriculture (USDA).

3.4.2 Utility Emissions Factors

Emissions of CO_2, methane, and N_2O per MWh of electricity or therm of natural gas can vary by location and from year to year depending on several factors. Utility-specific emissions factors were obtained and used throughout the 2021 inventories to estimate GHG emissions from electricity and natural gas consumption. Sources for electricity and natural gas emissions factors are shown below.

- **Electricity:** A SMUD-specific CO_2 emissions factor for 2021 was provided by TCR. California-specific emissions factors for methane and N_2O were obtained from EPA's Emissions & Generation Resource Integrated Database (eGRID) 2021 model for (EPA 2023).
- **Natural Gas:** Utility natural gas emissions factors for CO_2, methane, and N_2O were obtained from TCR's 2023 Default Emission Factors (TCR 2023).

Specific utility emissions factors used in the inventory calculations are shown in Tables 4 and 5. Emissions factors are shown in standards units for electricity (pounds of GHG per MWh) and natural gas (pounds per therm). Emissions factors are also presented in pounds of GHG per kilo British thermal unit (kBTU) to enable a comparison between energy types in similar terms.

Table 4 2021 Elk Grove Electricity Emissions Factors

Provider	Pollutant	Emissions Factor (lb/MWh)	Emissions Factor (lb/kBTU)
SMUD	CO_2	534.47	0.1566075
SMUD	CH_4	0.031	0.0000091
SMUD	N_2O	0.004	0.0000012

Notes: CH_4 = methane; CO_2e = carbon dioxide equivalent; kBTU = kilo British thermal unit; lb = pounds; MWh = megawatt-hours; N_2O = nitrous oxide; SMUD = Sacramento Municipal Utility District.

Source: Utility emissions factors provided by TCR 2023 and EPA 2023.

Table 5 2021 Elk Grove Natural Gas Emissions Factors

Provider	Pollutant	Emissions Factor (lb/therm)	Emissions Factor (lb/kBTU)
PG&E	CO_2	11.6977276	0.11700521
	CH_4	0.0010362	0.0000104
	N_2O	0.0000220	0.0000002

Notes: CH_4 = methane; CO_2 = carbon dioxide; kBTU = kilo British thermal unit; lb = pounds; MWh = megawatt-hours; N_2O = nitrous oxide; PG&E = Pacific Gas & Electric.

Source: Utility emissions factors provided by TCR 2023.

3.4.3 Building Energy

Building energy use in the city resulted in approximately 398,365 $MTCO_2e$ in 2021. This sector generated approximately 38 percent of the City's community emissions in 2021 and represents the second-largest emissions sector in the inventory. Emissions were a result of natural gas combustion for heating and cooking in homes and businesses and electricity use, primarily for lighting and heating, ventilation, and air conditioning (HVAC) and to power appliances. Emissions from electricity come from the portion of SMUD's electricity portfolio that is not yet carbon free. In 2021, 48

percent of SMUD's electricity mix came from carbon-free sources (CEC 2023). A marginal amount of nonresidential building energy emissions was associated with the consumption of diesel, natural gas, and gasoline in nonresidential backup generators. Annual electricity, natural gas, and backup generator usage and GHG emissions are shown in Table 6, and additional information regarding each emissions source and calculations are discussed below.

Table 6 2021 Elk Grove Community Building Energy Use and GHG Emissions

Energy Type	Quantity	GHG Emissions
Electricity	**kWh**	**$MTCO_2e$**
Residential	617,573,503	150,260
Nonresidential	416,331,544	101,296
Electricity Total	*1,033,905,047*	*251,556*
Natural Gas	**Therms**	**$MTCO_2e$**
Residential	22,858,657	121,641
Nonresidential[1]	4,716,002	25,096
Natural Gas Total	*27,574,659*	*146,736*
Backup Generators	**gal / therms**	**$MTCO_2e$**
Nonresidential - Diesel	6,959 (gal)	71
Nonresidential – Natural Gas	139 (therms)	1
Nonresidential - LPG	114 (gal)	1
Nonresidential Backup Generator Total[2]	*NA*	*73*
Energy Combined[2]	**NA**	**$MTCO_2e$**
Residential	NA	271,900
Nonresidential	NA	126,465
Total[2]	**NA**	**398,365**

Notes: Totals in columns may not sum exactly due to independent rounding. Gal = gallons; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; kWh = kilowatt-hour; NA = not applicable

[1] Nonresidential natural gas represents commercial nonresidential only, as industrial usage was not available due to the CPUC's 15/15 Rule.

[2] Summary data for quantity not applicable due to a difference in energy units.

Source: Data compiled and modeled by Ascent in 2023.

RESIDENTIAL ENERGY

Residential energy emissions in the city result indirectly from electricity consumption and directly from onsite combustion of natural gas. SMUD is the provider of residential electricity in the city. To calculate the $MTCO_2e$ of residential electricity consumption, emissions factors (shown in Table 4) for CO_2, methane, and N_2O were applied to electricity consumption data. Annual residential natural gas consumption in therms was obtained from PG&E. CO_2, methane, and N_2O emissions factors for natural gas were applied to consumption data to estimate $MTCO_2e$ from residential natural gas usage.

Residential electricity use accounted for 150,260 $MTCO_2e$, which represents 38 percent of emissions within the sector. Residential natural gas use accounted for 121,641 $MTCO_2e$, which represents 31 percent of the community's 2021 building energy emissions.

NONRESIDENTIAL ENERGY

Nonresidential energy emissions, which are generated by commercial and industrial uses, result indirectly from electricity consumption and directly from onsite combustion of natural gas. SMUD provides nonresidential electricity in the city and PG&E provides nonresidential natural gas. Natural gas consumption data for industrial uses were not available due to the California Public Utility Commission's (CPUC) 15/15 Rule, so only natural gas for commercial uses is accounted for in this inventory.[2] Emissions associated with nonresidential energy consumption were quantified using the same methods as described above for residential energy calculations.

Data for annual nonresidential backup generators were obtained from SMAQMD. Generator horsepower and total annual hours used were provided for each permitted generator in the city. Data were then converted to gallons for diesel fuel and liquid propane gas (LPG) and therms for natural gas. Emissions factors obtained from TCR were applied to fuel consumption data to estimate GHG emissions associated with nonresidential backup generator usage.

Nonresidential electricity use accounted for 101,296 $MTCO_2e$, which represents 25 percent of emissions within the sector. Nonresidential natural gas use accounted for 25,096 $MTCO_2e$, which represents 6 percent of the City's 2021 building energy emissions. Nonresidential backup generators also accounted for 73 $MTCO_2e$, representing less than 1 percent of emissions from the building sector in 2021.

3.4.4 On-Road Transportation

Based on modeling conducted, on-road transportation in the city resulted in approximately 586,220 $MTCO_2e$ in 2021, or 56 percent of the City's total community emissions. The on-road transportation sector represents the largest emissions sector in the city. Annual vehicle miles traveled (VMT) and GHG emissions from on-road transportation are shown in Table 7. Additional details and calculation methodologies and assumptions are described below.

Table 7 2021 Elk Grove Community On-Road Transportation VMT and GHG Emissions

Source	Annual VMT	GHG Emissions ($MTCO_2e$)
On-Road Passenger Transportation	944,367,693	339,716
On-Road Commercial Transportation	192,332,970	246,504
Total	**1,136,700,664**	**586,220**

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.

Source: Data compiled and modeled by Ascent in 2023, based on modeling from Fehr & Peers.

On-road transportation emissions are primarily the result of the combustion of gasoline and diesel fuels in passenger vehicles (i.e., cars, light-duty trucks, and motorcycles) and commercial vehicles (i.e., medium- and heavy-duty trucks) permitted to operate "on road." To a smaller degree, emissions from on-road electric vehicles also result from upstream electricity generation; these emissions are represented in annual electricity emissions in the city (captured in the building energy sector). Due to lack of available data, emissions from the combustion of natural gas and other non-electric alternative fuels in on-road vehicles were not included in the community inventory and are assumed to have minimal contribution to total emissions.

Fehr & Peers conducted a VMT analysis for the City using the EGSIM20 travel model. It considered daily VMT in the city for 2021 and annualized the daily VMT using an annualization factor of 334.[3] Passenger vehicles accounted for 944,367,693 VMT in 2021 and resulted in 339,716 $MTCO_2e$, which represents 58 percent of total on-road emissions for the City. Commercial vehicles accounted for 192,332,970 VMT and resulted in 246,504 $MTCO_2e$, which represents 42 percent of total on-road emissions. These VMT estimates are associated with trips that begin or end in the city. VMT

[2] The 15/15 Rule states that a utility cannot provide an anonymized data set if the set does not consist of at least 15 accounts and no one account accounts for more than 15 percent of the total consumption of the data set (CPUC 2014).

[3] This annualization factor comes from an analysis done using Caltrans Performance Measurement System (PeMS) that determined the relationship between daily and annual volume for interstates in the Sacramento region.

estimates included 100 percent of vehicle trips that both originate from and end in the city (i.e., fully internal trips), 50 percent of trips that either end in or depart from the city (i.e., internal-external, or external-internal trips), and zero percent of vehicle trips that are simply passing through the city boundaries (i.e., external-external, or "pass-through," trips). This vehicle trip accounting method is consistent with the Regional Targets Advisory Committee (RTAC) origin-destination method established through Senate Bill 375 and CARB recommendations.

Two countywide VMT emissions rates, one for passenger vehicles and one for commercial vehicles, were derived from EMFAC2021. EMFAC2021 was used to generate emission rates for Sacramento County for the calendar year 2021 with all vehicle classes, model years, speeds, and fuel types (e.g., gasoline, electricity). The countywide $MTCO_2e$ per mile emissions factors were calculated based on the distribution of VMT for each vehicle class and its emissions factor.

3.4.5 Off-Road Vehicles and Equipment

Based on modeling conducted, off-road vehicles and equipment operating in the city emitted 18,341 $MTCO_2e$ in 2021, or 2 percent of the 2021 community inventory. The largest emissions-generating off-road category is construction and mining equipment, which produced 9,033 $MTCO_2e$ in 2021 and accounted for 49 percent of emissions within the sector. The estimated annual emissions and scaling factors used are presented in Table 8 by vehicles and equipment type. Additional details regarding calculation methods and assumptions are discussed below.

Table 8 2021 Elk Grove Community Off-Road Vehicles and Equipment GHG Emissions and Scaling Method

Off-Road Vehicles and Equipment Type	GHG Emissions ($MTCO_2e$)	Scaling Method
Construction and Mining Equipment	9,033	Service Population
Industrial Equipment	1,219	Employment
Lawn and Garden Equipment	2,817	Population
Light Commercial Equipment	2,071	Employment
Portable Equipment	1,905	Employment
Recreational Equipment	229	Population
Transportation Refrigeration Units	1,066	Service Population
Total	**18,341**	NA

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; NA = not applicable.

Source: Data compiled and modeled by Ascent in 2023, based on CARB's OFFROAD2021 model.

Emissions from the off-road vehicles and equipment sector result from fuel combusted in off-road vehicles and equipment. Data associated with this sector were available from CARB's OFFROAD2021 model. This model provides emissions details at the state, air basin, or county level. Sacramento County emissions data from OFFROAD2021, which include emissions from the entire county, were apportioned to the city using custom scaling factors depending on the off-road vehicle and equipment type. For example, due to the likely correlation between commercial activity and employment, the city's portion of emissions from light commercial equipment in the entire county is assumed to be proportional to the number of jobs in the city as compared to the county as a whole.

3.4.6 Solid Waste

Based on modeling conducted, the solid waste sector was responsible for 20,222 $MTCO_2e$ in 2021, or 2 percent of community GHG emissions. Community-generated solid waste emissions are associated primarily with the decomposition of solid waste generated by city residents and businesses in landfills. A smaller proportion of emissions are produced by compost generated by the city. Table 9 summarizes emissions from the solid waste sector. Additional details regarding calculation methods and assumptions are discussed below.

Table 9 2021 Elk Grove Community Solid Waste Quantity and GHG Emissions

Source	Quantity (tons)	GHG Emissions ($MTCO_2e$)
Community-Generated Solid Waste	64,689	18,508
Compost	24,480	1,714
Total	**89,169**	**20,222**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

COMMUNITY-GENERATED SOLID WASTE

Methane emissions associated with community-generated solid waste occur from the decay of landfill disposed waste generated annually by residences and businesses in the city. A total of 64,689 tons of landfilled waste was reported for the city in 2021 and resulted in 18,508 $MTCO_2e$, which represents 92 percent of total solid waste emissions for the 2021 inventory. Data for landfilled waste were provided by the City.

The amount of methane released from community-generated waste depends on the LFG management systems of the landfills at which the waste is disposed. Information regarding the use of an LFG capture system was available from EPA's Landfill Methane Outreach Program. All facilities where the city sends its solid waste include an LFG capture system; therefore, the default LFG collection efficiency of 0.75 was applied to adjust emissions estimates, as recommended by the Community Protocol. Solid waste calculations were computed in ClearPath using California-specific default waste characterization emissions factors.

COMPOSTING

In addition to solid waste pickup and disposal, the City also collects and composts organic waste (i.e., food waste and green waste). While composting does produce GHG emissions, GHG emissions from composting are significantly lower than those associated with the decomposition of organic waste that is sent to landfills. A total of 24,480 tons of organic waste was reported in 2021 and resulted in 1,714 $MTCO_2e$, which represents 8 percent of total emissions from the solid waste sector in 2021. Organic waste tonnage data were provided by the City.

Emissions from composting were calculated using CARB's *Method for Estimating Greenhouse Gas Emission Reductions from Diversion of Organic Waste from Landfills to Compost Facilities* (CARB 2016). CARB's method remains the best guidance on estimating GHG emissions for compost, but it is important to note that emissions factors provided in the guidance are calculated using different GWP values for methane and N_2O than the ones used in this inventory. The emissions factors were derived using the IPCC's Fourth Assessment, rather than the IPCC's most recent Sixth Assessment, using a GWP value of 25 for methane and 293 for N_2O.

3.4.7 Water Supply

Based on modeling conducted, water supply in the city resulted in GHG emissions of 2,802 $MTCO_2e$, which represents less than 1 percent of total community emissions. Water is supplied by the Elk Grove Water District (EGWD) and the Sacramento County Water Agency (SCWA). GHG emissions associated with water consumption occur from the indirect use of energy associated with water extraction, conveyance, treatment, and distribution to the point of use (e.g., residences and businesses).

Private wells also account for less than 1 percent of annual water consumption. Data on the number of estimated wells in the city were provided by Sacramento County Public Health. The average water consumption per well was assumed to be 0.5 acre-feet per year.[4] Water from private wells is supplied from local sources within the city;

[4] An average water consumption value of 0.05 acre-feet per year was recommended by Zone 7 Water Agency, a water provider in Livermore, California.

therefore, it was assumed that all electricity usage associated with extracting and conveying well water is captured in the emissions estimates of the building energy sector because these activities occur within the city.

The methods used are explained in more detail below. Table 10 presents water supply, electricity consumption, and associated GHG emissions for the city.

Table 10 2021 Elk Grove Community Water Supply Quantity and GHG Emissions

Source	Quantity (AF)	Electricity Consumption (kWh)	GHG Emissions ($MTCO_2e$)
Elk Grove Water District	6,862	2,722,412	662
Sacramento County Water Agency	19,951	8,797,498	2,140
Wells	46	8,786	NA
Total	**26,859**	**11,528,696**	**2,802**

Notes: AF = acre-feet; GHG = greenhouse gas; kWh = kilowatt-hour; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

WATER AND ELECTRICITY CONSUMPTION

EGWD and SCWA provided annual water consumption data and annual electricity consumption data for 2021 for the customers they serve in the city. To calculate GHG emissions from the water sector, electricity emissions factors (shown in Table 4) were applied to the total electricity consumption data for each water provider. Water supplied by EGWD resulted in 662 $MTCO_2e$, which represents 24 percent of emissions from the water sector. Water supplied by SCWA resulted in 2,140 $MTCO_2e$, which represents the other 76 percent of emissions from the water sector.

3.4.8 Wastewater Treatment

Based on modeling conducted, wastewater treatment associated with the city resulted in GHG emissions of 2,957 $MTCO_2e$, which represents less than 1 percent of total emissions for 2021. A centralized WWTP accounts for 94 percent of emissions from wastewater treatment, while septic systems make up the remaining 6 percent of emissions from this sector. Wastewater treatment emissions are summarized in Table 11, and additional details for this sector are included below.

Table 11 20221 Elk Grove Community Wastewater Treatment GHG Emissions

Wastewater Treatment Type	GHG Emissions ($MTCO_2e$)
Centralized WWTP	2,791
Septic Systems	167
Total	**2,957**

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; WWTP = wastewater treatment plant.

[1] Data for 2022 were used instead because SRWTP went through process changes in 2021. Data from 2022 were a better representation of SRWTP's current emissions.

Source: Data compiled and modeled by Ascent in 2023.

CENTRALIZED WASTEWATER TREATMENT PLANTS

Emissions associated with the treatment of sewage are highly dependent on the processes and components used by specific WWTPs such as lagoons, nitrification or denitrification, and digester gas or combustion devices. SRWTP is the centralized wastewater treatment provider in the city. It collects wastewater from customers' homes and businesses. Collected wastewater enters the regional sewer system, which is operated by the Sacramento Regional County Sanitation District and is then conveyed and pumped to the facility where it is treated before being safely reintroduced to the environment. Data specific to SRWTP's wastewater processes were provided by SRWTP, including

average daily digester gas, BTU content of the digester gas, and average daily nitrogen discharge. It was assumed that individuals in the city who do not have a septic system are served by SRWTP.

Stationary methane and N_2O emissions from the combustion of digester gas were calculated based on average daily digester gas and the average BTU content of the digester gas, using Community Protocol equations WW.1b and WW.2b, respectively. Process N_2O emissions for WWTPs with nitrification or denitrification were calculated based on population and an industrial-commercial equivalent factor of 1.25 since both industrial and commercial land uses are served by the SRWTP, using Community Protocol equation WW.7. Fugitive N_2O emissions from effluent discharge were calculated based on average daily nitrogen load and an effluent factor of 0.005—because discharge is released to the Sacramento River—using Community Protocol equation WW.12.

Energy-related emissions result from the energy required for wastewater treatment operations, including the energy used in wastewater conveyance as well as energy used throughout wastewater treatment processes and to provide power to the SRWTP facility. Energy-related emissions were estimated using the energy emissions factors for SMUD and PG&E, as shown in Table 4 and Table 5 in section 3.4.2, using Community Protocol equation WW.15.

SEPTIC SYSTEMS

Onsite septic systems are used to collect wastewater in rural areas of the city. These systems collect wastewater onsite in underground tanks, which create anaerobic conditions. Microorganisms biodegrade the soluble organic material found in waste, which results in fugitive methane emissions. Consistent with the Community Protocol, wastewater discharge and treatment energy intensities associated with septic tanks and other onsite systems are assumed to be negligible.

Data provided by Sacramento County Public Health determined that there are an estimated 441 septic systems in the city. Methane emissions from the septic systems were calculated based on the population served by these systems, using equation WW.11(alt) of the Community Protocol. It was assumed each septic system serves one household and average household size was used to calculate total population served by septic systems. This method resulted in an estimate of 1,424 individuals in the city to be served by septic systems.

3.4.9 Agriculture

Based on modeling conducted, emissions from the agriculture sector accounted for approximately 10,275 $MTCO_2e$ in 2021, or approximately 1 percent of the City's community emissions. Emissions in this sector are generated from fertilizer application, livestock management, the operation of agricultural equipment, and from building energy use associated with agricultural operations. Emissions from livestock, which include enteric fermentation and manure management, accounted for 27 percent of emissions from the agriculture sector, emissions from fertilizer application accounted for 15 percent, emissions from agricultural equipment accounted for 9 percent, and emissions from building energy associated with agricultural operations accounted for 50 percent. The City's agriculture emissions in 2021 are summarized in Table 12, and additional details and information about this sector are included below.

Table 12 2021 Elk Grove Community Agriculture GHG Emissions

Agricultural Activity	GHG Emissions ($MTCO_2e$)
Livestock Management	2,779
Fertilizer Application	1,518
Agricultural Equipment	875
Agricultural Building Energy	5,104
Total	**10,275**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

LIVESTOCK MANAGEMENT

Livestock produce methane and N_2O emissions through enteric fermentation (a type of digestion process) and decomposition of manure produced by these animals. The 2021 Sacramento County Crop Report and USDA's 2017 Census of Agriculture provided total heads of beef cattle and calves, sheep and lambs, goats, poultry, swine, and horses in Sacramento County (County of Sacramento 2021; USDA 2017). These data were scaled to the city level using the proportion of agriculture acres in the city compared to the county. Emissions factors for livestock were obtained from CARB's California GHG Emission Inventory (CARB 2022).

Livestock heads data are shown in Table 13 below, along with associated data sources.

Table 13 2021 Elk Grove Livestock Heads Data and Sources

Livestock Type	Livestock Heads	Source	GHG Emissions ($MTCO_2e$)
Cattle and Calves	572	2021 Sacramento County Crop Report	2,622
Sheep and Lambs	133	USDA 2017 Census of Agriculture	46
Goats	148	USDA 2017 Census of Agriculture	38
Poultry	181	USDA 2017 Census of Agriculture	0.8
Swine	10	USDA 2017 Census of Agriculture	5
Horses	72	USDA 2017 Census of Agriculture	67

Notes: USDA = US Department of Agriculture; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

Livestock emissions factors for enteric fermentation and manure management are displayed in Table 14. Emissions factors were derived from CARB's California GHG Emission Inventory, which provides statewide heads and emissions for a variety of subcategories of each livestock type. For example, enteric fermentation emissions for cattle are provided for dairy calves, dairy cows, dairy replacements, beef calves, beef replacements, beef cows, bulls, stocker and feedlot heifer, and stocker and feedlot steer. Using data for all subcategories, a weighted average enteric fermentation emissions factor for cattle was calculated and used to estimate emissions from enteric fermentation from the cattle and calves livestock type in the city.

Table 14 2021 Elk Grove Enteric Fermentation and Manure Management Emissions Factors

Livestock Type	Enteric Fermentation Emissions Factor (kg CH_4/head)	Manure Management Emissions Factor (kg CH_4/head)	Manure Management Emissions Factor (kg N_2O/head)
Cattle and Calves	80	73	1.6
Sheep and Lambs	8	0.7	0.4
Goats	5	0.4	0.4
Poultry	0	0.1	0.004
Swine	2	16	0.1
Horses	18	3.3	1.3

Notes: CH_4 = methane; kg = kilogram; N_2O = nitrous oxide.

Source: Data compiled by Ascent in 2023.

FERTILIZER APPLICATION

The application of fertilizers and other soil amendments produces GHG emissions. Nitrogen fertilizers produce N_2O emissions, and application of lime produces emissions of CO_2. Data for nitrogen (including urea) and lime application were obtained from the California Department of Food and Agriculture's (CDFA's) *2021 Fertilizer Tonnage Report* (CDFA 2021). Emissions factors and quantification methods for GHG emissions associated with application of nitrogen

and lime were obtained from IPCC. Data for fertilizer and lime application and associated emissions are presented in Table 15 below.

Table 15 2021 Elk Grove Fertilizer and Lime Application Data and Emissions

Application Type	Application Amount (tons)	Source	GHG Emissions ($MTCO_2e$)
Nitrogen	310	CDFA	1,506
Lime	30	CDFA	12

Notes: CDFA = California Department of Food and Agriculture; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

Emissions factors and data sources for fertilizer and lime application are shown in Table 16.

Table 16 2021 Elk Grove Fertilizer and Lime Application Emissions Factors and Sources

Application Type	Emissions Factor	Source
Nitrogen (g N_2O/ton N)	17,820	IPCC
Lime (g CO_2/ton lime)	398,886	IPCC

Notes: CO_2 = carbon dioxide; g = grams; IPCC = Intergovernmental Panel on Climate Change; N = nitrogen; N_2O = nitrous oxide.

Source: Data compiled by Ascent in 2023.

AGRICULTURAL EQUIPMENT

GHG emissions associated with agricultural equipment were obtained from CARB's OFFROAD2021 model, as discussed in Section 3.4.5. "Off-Road Vehicles and Equipment." Agricultural equipment emissions were obtained from CARB at the Sacramento County level and were scaled to the city level using the percent of Sacramento County's agricultural acres that are within the city's boundaries.

Agricultural equipment emissions also include GHG emissions from diesel-powered irrigation pumps. SMAQMD provided the number of diesel irrigation pumps in the city. Annual diesel fuel consumption was not available so the air district-specific average daily emissions factor (daily tons of CO_2 per pump) provided by CARB was used instead to estimate emissions (CARB 2006). This daily value was then annualized by a factor of 365, per CARB's guidance, to calculate total annual emissions for 2021.

Activity data and associated GHG emissions from agricultural equipment are included in Table 17.

Table 17 2021 Elk Grove Agricultural Equipment Data and Sources

Equipment Type	Activity Data	Source	GHG Emissions ($MTCO_2e$)
Off-Road Agricultural Equipment	—[1]	CARB	764
Diesel-Powered Irrigation Pumps	2 pumps	SMAQMD	111
Total	**NA**	**NA**	**875**

Notes: CARB = California Air Resources Board; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; NA = not applicable; SMAQMD = Sacramento Metropolitan Air Quality Management District.

[1] Emissions from off-road agricultural equipment were obtained directly from CARB's OFFROAD2021 model; no activity data were used to calculate emissions estimates.

Source: Data compiled and modeled by Ascent in 2023.

AGRICULTURAL BUILDING ENERGY

Building energy emissions associated with agricultural operations in the city result indirectly from electricity consumption. Building electricity data specific to agricultural operations was provided by SMUD. This subsector is included in the agriculture sector, rather than the building energy sector, because it will allow for more accurate

forecasting of future emissions from building energy associated with agricultural operations. Agricultural operations have different growth projections than residential and nonresidential building development projections in the city. To calculate the $MTCO_2e$ of agricultural electricity consumption, emissions factors for CO_2, methane, and N_2O were applied to electricity consumption data. Activity data and associated GHG emissions from agricultural building energy are included in Table 18.

Table 18 2021 Elk Grove Agricultural Building Energy Data

Energy Type	Quantity (kWh)	GHG Emissions ($MTCO_2e$)
Agricultural Building Energy	20,976,011	5,104

Notes: GHG = greenhouse gas; kWh = kilowatt-hour; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

3.5 CITY OPERATIONS INVENTORY DATA AND ASSUMPTIONS

3.5.1 Sector-Specific Assumptions and Methods

The following sections describe in detail the methods, data, and assumptions that were used in estimating the City's municipal operations GHG emissions in 2021. Employment data obtained from the City were used to scale activity levels for certain emissions sources and sectors.

The following summarizes data sources and methods used in estimating the City's municipal operations GHG emissions in 2021:

- **Buildings and Facilities:** Annual municipal electricity and natural gas usage data for the City were provided by SMUD and PG&E. Emissions factors were obtained from TCR and EPA. Annual municipal backup generator usage was provided by the City, and emissions factors for backup generators were available from TCR.
- **Streetlights and Traffic Signals:** Annual municipal electricity use for all streetlights and traffic signals was provided by SMUD. Electricity emissions factors were obtained from TCR and EPA.
- **Employee Commute:** Emissions associated with City employee commutes were calculated using employee commute data provided by the City, including average commute distance, percentage of year each employee was employed with the City, and average number of days per week each employee commutes. Vehicle emissions factors were derived using EMFAC2021.
- **Vehicle Fleet:** Municipal vehicle fleet VMT data were provided by the City. Vehicle emissions factors were derived using EMFAC2021.
- **Solid Waste:** Emissions associated with waste and compost generated by municipal operations were estimated using municipal disposal data available from the City. LFG collection information was available from EPA. Solid waste calculations were computed in ClearPath using California-specific solid waste emissions factors.
- **Water Supply:** Water consumption data for municipal facilities were provided by the City's water purveyors, EGWD and SCWA. An average supplier-specific energy intensity (AF/kWh) was applied to water consumption data provided by EGWD and SCWA to estimate total electricity consumption based on water use. Electricity emissions factors from TCR and EPA were applied to total electricity consumption.
- **Wastewater Treatment:** Data regarding treatment processes, digester gas production and combustion, and nitrogen load were obtained from SRWTP. Data were scaled down to the municipal level by population provided by the City.
- **Process and Fugitive:** Data regarding natural gas consumption was provided by PG&E. Calculations were computed in ClearPath using default emissions factors.

It should be noted that the GHG emissions associated with City operations are not additive emissions to the City's community inventory GHG emissions, except for process and fugitive emissions since they are not included in the City's community inventory.

3.5.2 Buildings and Facilities

Municipal buildings and facilities accounted for approximately 1,741 $MTCO_2e$, or 41 percent of total emissions resulting from City operations in 2021. This sector includes emissions from energy (i.e., electricity, natural gas, diesel) used for all City buildings and facilities, primarily for lighting, HVAC, pumps, generators, and other equipment. Electricity accounted for approximately 47 percent of emissions from this sector in 2021, natural gas accounted for approximately 53 percent, and diesel backup generators accounted for less than 1 percent. Building energy use and emissions by source are presented in Table 19 below.

Table 19 2021 Elk Grove City Operations Buildings and Facilities Energy Use and GHG Emissions

Source	Quantity	GHG Emissions ($MTCO_2e$)
Electricity (MWh)	3,352	816
Natural Gas (therms)	173,627	924
Backup Generators (gallons)	181	2
Total	**NA**	**1,741**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWh = megawatt-hours; NA = not applicable.

Source: Data compiled and modeled by Ascent in 2023.

Buildings and facilities energy use data for 2021 were provided by SMUD and PG&E, and generator fuel usage was provided by SMAQMD. Municipal electricity GHG emissions were estimated using 2021 electricity emissions factors provided by TCR and EPA. Municipal natural gas and backup generator GHG emissions were estimated using emissions factors from TCR. GHG emissions were estimated using the same methods as described in the community building energy sector.

3.5.3 Streetlights and Traffic Signals

City streetlights and traffic signals accounted for approximately 893 $MTCO_2e$ in 2021, or 21 percent of total City operations emissions in 2021. This sector includes emissions associated with electricity consumption to power City-owned streetlights and traffic signals. Electricity consumption and GHG emissions associated with streetlights and traffic signals are shown in Table 20.

Table 20 2021 Elk Grove City Operations Streetlights and Traffic Signals GHG Emissions

Source	Quantity (MWh)	GHG Emissions ($MTCO_2e$)
Streetlights	3,094	753
Traffic Signals	577	140
Total	**3,670**	**893**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MWh = megawatt-hours.

Source: Data compiled and modeled by Ascent in 2023.

Electricity consumption from streetlights and traffic signals were provided by SMUD. GHG emissions were estimated using the methods and emissions factors as described in the community building energy sector.

3.5.4 Employee Commute

Employee commute accounted for approximately 835 $MTCO_2e$ in 2021, approximately 20 percent of total City operations emissions in 2021. This sector estimates GHG emissions associated with VMT for City employees commuting to and from work. Table 21 shows employee commute VMT and GHG emissions. Additional details regarding calculation methods and assumptions are discussed below.

Table 21 2021 Elk Grove City Operations Employee Commute GHG Emissions

Source	VMT	GHG Emissions ($MTCO_2e$)
Employee Commute	2,319,909	835

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.

Source: Data compiled and modeled by Ascent in 2023.

Total VMT was estimated based on employee commute data provided by the City. Daily VMT commute distance for each employee was estimated by calculating the distance between the zip code associated with the employee's home and the zip code associated with the City's office buildings.[5] The calculation also took into account the percentage of the year each employee was employed with the City and the average number of days per week each employee commutes to the office. The daily VMT was annualized by 234, which is the average number of work days in a year when holidays and vacation are taken into account. Annual VMT data for each employee was then summed to calculate total annual VMT for all employees. Based on a 2019 employee commute survey that showed 97 percent of employees drive alone to work, total annual VMT for all employees was then reduced by 3 percent. Emissions were estimated using emissions factors derived from EMFAC2021, as discussed in the on-road transportation sector of the community inventory.

3.5.5 Vehicle Fleet

City-owned vehicle fleet emissions accounted for 620 $MTCO_2e$ in 2021, approximately 15 percent of total municipal operations emissions in 2021. This sector includes emissions estimated from on-road vehicles owned and operated by the City. Table 21 displays vehicle fleet VMT by vehicle class and type, as well as associated emissions factors and GHG emissions. Additional details regarding calculation methods and assumptions are discussed below.

Table 22 2021 Elk Grove City Operations Vehicle Fleet GHG Emissions

Vehicle Class and Type	VMT	Emissions Factor ($MTCO_2e$/mile)	GHG Emissions ($MTCO_2e$)
LDA Combustion	336,165	0.0003	107
LDT1 Combustion	37,230	0.0004	14
LDT1 Electric	1,460	0.0000	0
MDV Combustion	944,837	0.0005	458
LHD1 Combustion	31,691	0.0008	27
MCY Combustion	59,436	0.0002	14
Total	**1,410,819**	**NA**	**620**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled; LDA = passenger cars, LDT1 = light-duty trucks, MDV = medium-duty trucks, LHD1 = light-heavy-duty trucks, MCY = motorcycle.

Source: Data compiled and modeled by Ascent in 2023.

Daily VMT data for each vehicle in the City's fleet were provided by the City. The daily VMT for each non-police vehicle was annualized by a factor 234, which is the average number of work days in a year when holidays and

[5] For employees living in the same zip code as the City's offices, an average one-way commute distance of 3 miles was assumed.

average vacation hours are taken into account. The daily VMT for each police vehicle was annualized by a factor of 365 because these vehicles are typically used daily. Each vehicle in the City's fleet was assigned to an EMFAC vehicle class (e.g., LDA or MDV) and an emissions factor ($MTCO_2e$ per mile) for each vehicle class and fuel type (i.e., combustion or electric) was calculated using emissions factors derived from EMFAC 2021.

3.5.6 Solid Waste

Municipal solid waste disposal accounted for approximately 139 $MTCO_2e$ in 2021, or 3 percent of total City operations emissions in 2021. Solid waste emissions are generated from the decomposition of organic material in landfills and from composting. Table 23 presents estimated tons of solid waste disposal and associated GHG emissions from municipal operations.

Table 23 2021 Elk Grove City Operations Solid Waste GHG Emissions

Source	Quantity (tons)	GHG Emissions ($MTCO_2e$)
Landfill Disposed Waste	375	107
Compost	458	32
Total	**833**	**139**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

Tonnage data for landfilled-disposed waste and composted organic waste were provided by the City. A total of 375 tons of landfilled waste was reported for City operations in 2021 and resulted in 107 $MTCO_2e$, which represents 77 percent of total solid waste emissions for the City operations in 2021. A total of 458 tons of organic waste was reported for City operations in 2021 and resulted in 32 $MTCO_2e$, which represents 23 percent of total emissions from the solid waste sector. Methods for estimating emissions from these sources are based on the methodology described in the community solid waste sector.

3.5.7 Water Supply

Water supplied for the City's municipal operations resulted in approximately 9 $MTCO_2e$ in 2021, or less than 1 percent of total City operations GHG emissions in 2021. Water usage and associated electricity consumption are provided in Table 24.

Table 24 2021 Elk Grove City Operations Water Supply GHG Emissions

Source	Annual Water Consumption (AF)	Average Annual Electricity Consumption (kWh/AF)	Total Annual Electricity Consumption (kWh)	GHG Emissions ($MTCO_2e$)
EGWD	2.82	397	1,118	0.2
SCWA	82.02	441	36,167	8.8
Total	**84.84**	**NA**	**37,284**	**9**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gas; MWh = megawatt-hours; $MTCO_2e$ = metric tons of carbon dioxide equivalent; EGWD = Elk Grove Water District; SCWA = Sacramento County Water Agency.

Source: Data compiled and modeled by Ascent in 2023.

EGWD and SCWA provide water for City operations and provide annual water consumption data for the municipal facilities they serve within the City. Using an average annual electricity consumption value (kWh/AF) derived from the community data for each water provider, total electricity consumption associated with water consumption was calculated for EGWD and SCWA. To calculate GHG emissions, the electricity emissions factors provided by TCR and EPA were applied to total electricity consumption for each water provider.

3.5.8 Wastewater Treatment

Wastewater emissions associated with the City's municipal operations accounted for approximately 7 $MTCO_2e$ in 2021, or less than 1 percent of total City operations emissions in 2021. Municipal wastewater GHG emissions associated with this sector included emissions generated by the energy used to treat municipal wastewater as well as emissions that are produced as a result of wastewater treatment processes. GHG emissions from wastewater associated with City operations are shown in Table 25.

Table 25 2021 Elk Grove City Operations Wastewater GHG Emissions

Source	GHG Emissions ($MTCO_2e$)
Wastewater Treatment	7

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

Wastewater-related data was provided by SRWTP, which provides wastewater treatment for the City's municipal operations. Methods for estimating emissions from these sources are based on the methodology described in the community wastewater sector and were scaled based on the number of City employees in 2021.

3.5.9 Process and Fugitive Emissions

Process and fugitive emissions result from leakage in the local natural gas distribution system. Emissions in this sector accounted for approximately 32 $MTCO_2e$ in 2021, or less than one percent of the City's municipal operations. This sector was included in the City operations inventory to allow for comparison with the City's 2019 inventory, where it was also assessed. This sector was excluded, however, from the community inventory because it is not typically a sector included in the Community Protocol.

Emissions from this sector were calculated using ICLEI's ClearPath. To calculate emissions, the City's total annual natural gas consumption, provided by PG&E, was applied to the default leakage rate and emissions factors in ClearPath. Natural gas consumption and resulting GHG emissions from process and fugitive emissions are shown in Table 26.

Table 26 2021 Elk Grove City Operations Process and Fugitive GHG Emissions

Source	Annual Natural Gas Consumption (therms)	GHG Emissions ($MTCO_2e$)
Process and Fugitive Emissions	173,627	32

Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

4 SUMMARY OF RESULTS

4.1 COMMUNITY INVENTORY

4.1.1 Summary of GHG Emissions from Community Activities and Sources

Community activities generated 1,039,181 $MTCO_2e$ in 2021. The largest emissions-generating sectors include on-road transportation (56 percent) and building energy (38 percent). Collectively, on-road transportation and building energy accounted for approximately 94 percent of all community emissions in 2021. The remaining 6 percent of emissions are attributable to solid waste (2 percent), off-road vehicles and equipment (2 percent), wastewater treatment (less than 1 percent), water supply (less than 1 percent), and agriculture (less than 1 percent).

The 2021 inventory will be the City's GHG emissions baseline for the Climate Compass and will be used to forecast emissions and set emissions reductions targets. Table 27 and Figure 1 present the results of the City's 2021 community GHG emissions inventory by sector.

Table 27 2021 Elk Grove Community GHG Emissions Inventory

Sector	GHG Emissions ($MTCO_2e$)	Percent of Total
On-Road Transportation	586,220	56%
Building Energy (Includes Residential and Nonresidential)	398,365	38%
Solid Waste	20,222	2%
Off-Road Vehicles and Equipment	18,341	2%
Wastewater Treatment	2,957	<1%
Water Supply	2,802	<1%
Agriculture	10,275	1%
Total	**1,039,181**	**100%**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gases; $MTCO_2e$ = metric tons of carbon dioxide equivalent; NA = not applicable.

Source: Data modeled by Ascent in 2023.

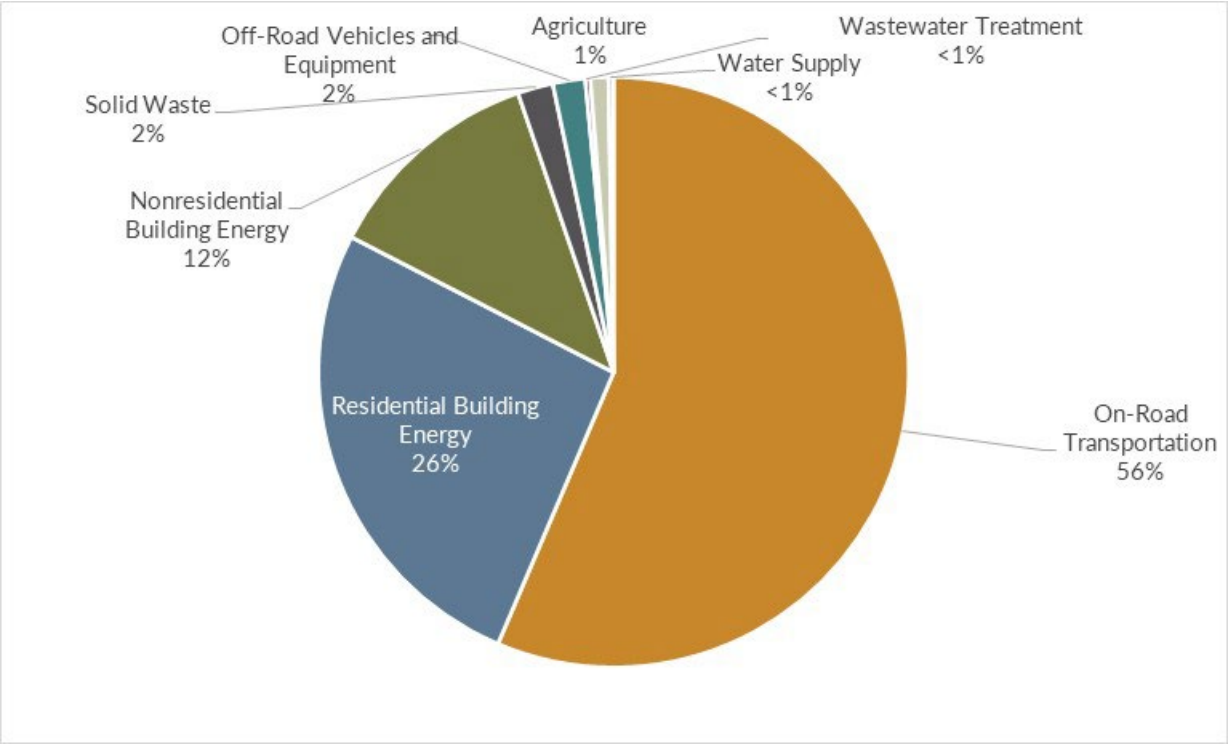

Figure 1 2021 City of Elk Grove Community GHG Emissions Inventory

4.1.2 2013 to 2021 Community GHG Inventory Comparison

This section compares the City's 2021 community inventory to the City's 2013 community inventory, which is the previous community inventory. Table 28 presents the total emissions for both inventory years by sector, as well as the percent change in emissions from 2013 to 2021.

Table 28 2013 and 2021 Elk Grove Community GHG Emissions Inventory Comparison

Sector	2013 GHG Emissions ($MTCO_2e$)	2021 GHG Emissions ($MTCO_2e$)	Percent Change 2013 to 2021
On-Road and Off-Road Transportation[1]	523,680	604,560	+15%
Building Energy	361,260	398,365	+10%
Solid Waste	26,260	20,222	-23%
Water Supply and Wastewater Treatment	7,177	5,759	-20%
Agriculture[2]	1,020	10,275	+907%
Total	**919,407**	**1,039,181**	**+13%**

Notes: Totals may not sum exactly due to independent rounding. $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data compiled and modeled by Ascent in 2023.

[1] The increase in on-road transportation emissions is due to a change in the travel model used for each inventory, along with the methods to quantify emissions. The City saw an overall increase in vehicle miles traveled which exceeded the benefits of cleaner vehicles over the 9-year period.

[2] This significant increase is due to building energy from agricultural operations being included in the agriculture sector in the 2021 community inventory. The 2013 community inventory only included emissions from livestock management, fertilizer application, and agricultural equipment.

A per capita comparison for the 2013 and 2021 community inventories is also shown in Table 29. This comparison accounts for the population growth the City has experienced since 2013. Since 2013, the City's population grew from 163,093 to 179,287.

Table 29 2013 and 2021 Elk Grove Community GHG Emissions Inventory Per Capita Comparison

Sector	2013 GHG Emissions Per Capita ($MTCO_2e$)	2021 GHG Emissions Per Capita ($MTCO_2e$)	Percent Change 2013 to 2021
On-Road and Off-Road Transportation[1]	3.21	3.37	+5%
Building Energy	2.22	2.22	0%
Solid Waste	0.16	0.11	-30%
Water Supply and Wastewater Treatment	0.04	0.03	-27%
Agriculture[2]	0.01	0.06	+816%
Total	**5.64**	**5.80**	**+2.8%**

Notes: Totals may not sum exactly due to independent rounding. $MTCO_2e$ = metric tons of carbon dioxide equivalent.

[1] The increase in emissions is due to a 29 percent increase in VMT from 2013 to 2021, as emissions factors for on-road transportation decreased between the two inventory years.

[2] This significant increase is due to building energy from agricultural operations being included in the agriculture sector in the 2021 community inventory.

Source: Data compiled and modeled by Ascent in 2023.

Based on the modeling conducted, total community GHG emissions increased by approximately 13 percent and per capita emissions increased by approximately 3 percent from 2013 to 2021. In general, differences in GHG emissions estimates between the inventories can be explained by:

- differences in data sources between inventories,
- the use of different GWP values between inventories,
- adjustments in calculation methodologies (e.g., equations and emissions factors), and
- differences in data included in each sector.

4.2 CITY OPERATIONS INVENTORY

4.2.1 Summary of GHG Emissions from City Operations

The City's municipal operations generated approximately 4,275 $MTCO_2e$ in 2021, which makes up less than one percent of the community emissions. Buildings and facilities (41 percent), streetlights and traffic signals (21 percent), and employee commute (20 percent) together account for approximately 82 percent of emissions from City operations in 2021. The remaining 18 percent of emissions are attributable to vehicle fleet (14 percent), solid waste (3 percent), process and fugitive emissions (1 percent), water supply (less than 1 percent), and wastewater treatment (less than 1 percent). Table 30 presents the City's 2021 municipal operations GHG emissions inventories by sector, and Figure 2 illustrates the municipal operations inventory.

Table 30 2021 Elk Grove City Operations GHG Emissions Inventory

Sector	$MTCO_2e$	Percent of Total
Buildings and Facilities	1,741	41%
Streetlights and Traffic Signals	893	21%
Employee Commute	835	20%
Vehicle Fleet	620	14%
Solid Waste	139	3%
Water Supply	9	<1%
Wastewater Treatment	7	<1%
Process and Fugitive Emissions	32	1%
Total	**4,275**	**100%**

Notes: Totals may not sum exactly due to independent rounding. $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

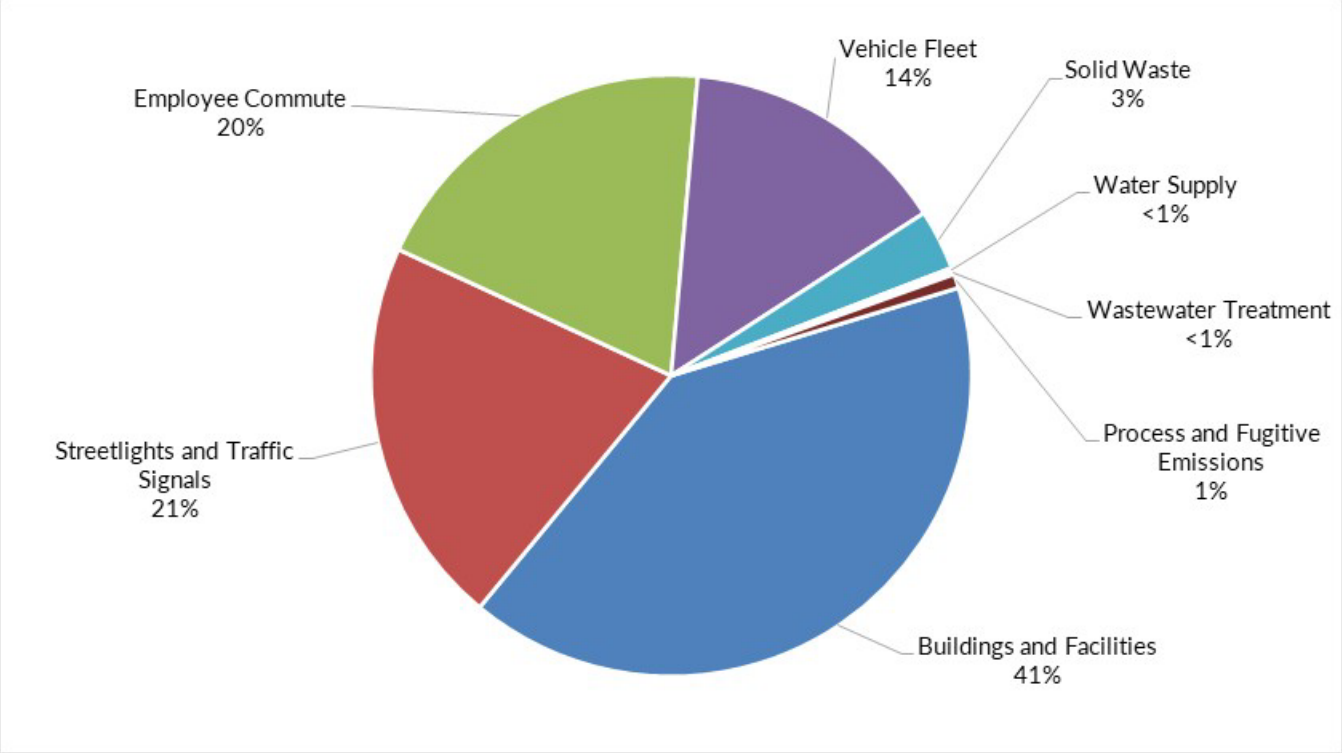

Figure 2 2021 City of Elk Grove City Operations GHG Emissions Inventory

4.2.2 2019 to 2021 City Operations Inventory Comparison

This section compares the City's 2021 municipal inventory to the City's 2019 municipal inventory, which is the last municipal inventory completed. Table 31 presents the total emissions for each inventory year by sector, as well as the percent change in emissions from 2019 to 2021.

Table 31 2019 and 2021 Elk Grove City Operations GHG Emissions Inventory

Sector	2019 GHG Emissions ($MTCO_2e$)	2021 GHG Emissions ($MTCO_2e$)	Percent Change 2019 to 2021
Buildings and Facilities[1]	643	1,741	+171%
Streetlights and Traffic Signals	617	893	+45%
Employee Commute	1,143	835	-27%
Vehicle Fleet	909	620	-32%
Solid Waste	83	139	+68%
Water Supply[2]	N/A	9	N/A
Wastewater Treatment	34	7	-80%
Process and Fugitive Emissions[3]	5	32	+540%
Total	**3,434**	**4,725**	**+25%**

Notes: Totals may not sum exactly due to independent rounding. $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not available.

[1] This increase is due to a higher electricity emissions factor and higher natural gas use in 2021.

[2] This sector was not assessed in the 2019 City operations inventory.

[3] This increase is due to higher natural gas use in 2021 associated with new City facilities

Source: Data compiled and modeled by Ascent in 2023.

Based on the modeling conducted, GHG emissions from City operations increased by approximately 25 percent from 2019 to 2021. In general, differences in GHG emissions estimates between the inventories can be explained by:

- differences in data sources between inventories,
- the use of different GWP values between inventories,
- adjustments in calculation methodologies (e.g., equations and emissions factors), and
- differences in data included in each sector.

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Appendix B

Greenhouse Gas Emissions Forecasts

Memo

455 Capitol Mall, Suite 300
Sacramento, CA 95814
916.444.7301

Date: June 18, 2025

To: Christopher Jordan and Carrie Whitlock (City of Elk Grove)

From: Brenda Hom, Hannah Kornfeld, Sonam Sahu, and Honey Walters (Ascent)

Subject: City of Elk Grove Climate Compass: Final Greenhouse Gas Emissions Forecasts Memorandum

INTRODUCTION

The City of Elk Grove (COEG) is developing its *Climate Compass: A Plan for Implementing Elk Grove's Climate, Sustainability, and Resilience Goals* (Climate Compass), the update to the City's 2019 Climate Action Plan (CAP). The goal of the Climate Compass is to provide a comprehensive and transformative framework for both mitigating and adapting to climate change while also supporting COEG's broader sustainability and resilience goals.

In preparation of the Climate Compass, COEG first completed a baseline greenhouse gas (GHG) emissions inventory to estimate emissions from the community and from COEG operations in 2021. The next step in this process is to forecast these GHG emissions and establish reduction targets. This technical memorandum provides the results of these forecasts as well as associated methods, assumptions, emissions factors, and data sources. The GHG emissions forecasts will provide the foundation for the forthcoming steps of the Climate Compass planning process, including the development and quantification of GHG emissions reduction measures and "gap analysis" evaluation (i.e., the calculated gap between the estimated GHG reductions from local action and the established targets).

ORGANIZATION OF THIS MEMORANDUM

This memorandum consists of two main parts:

- **Section 1: Summary of Inventory Results** presents an overview of the city's 2021 community and COEG operations inventories.
- **Section 2: Greenhouse Gas Emissions Forecasts** summarizes the forecasted GHG emissions under "business-as-usual" (BAU) and legislative-adjusted BAU scenarios for years 2030, 2035, 2040, 2045 and 2050 for the community inventory and for years 2030 and 2045 for COEG operations inventory.

1 SUMMARY OF INVENTORY RESULTS

1.1 2021 COMMUNITY INVENTORY

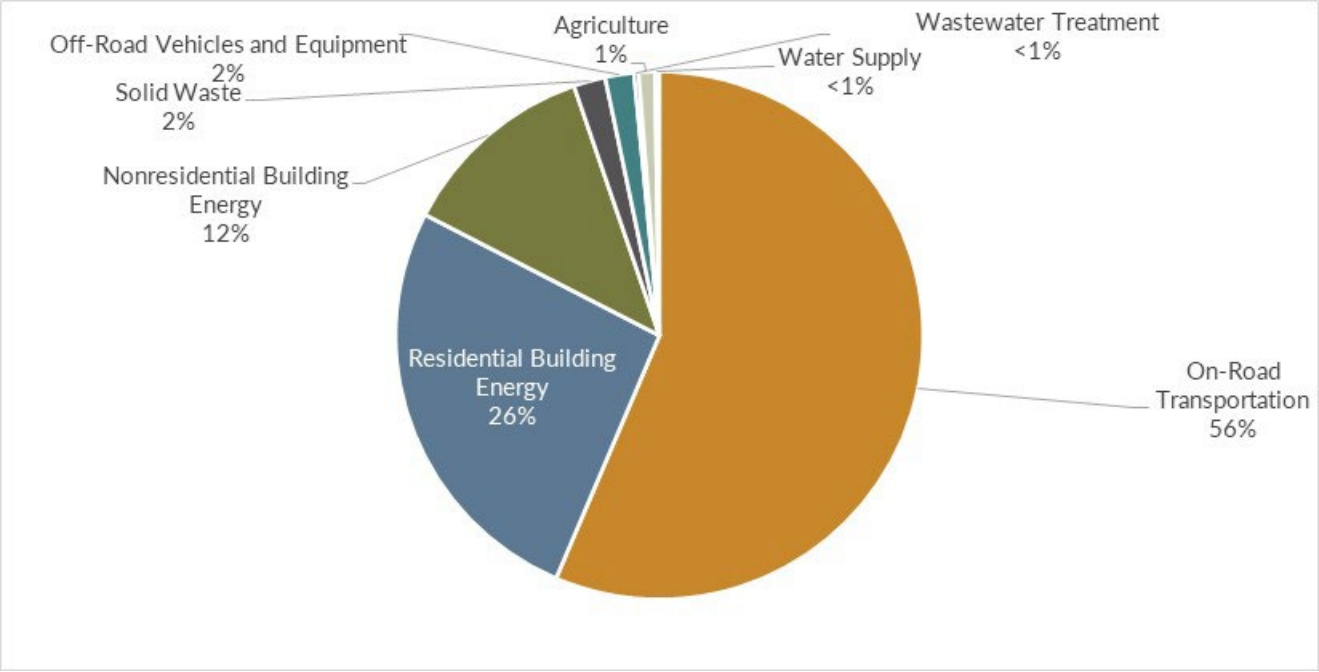
Based on the modeling conducted, community activities in the city generated approximately 1,039,181 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2021. The largest emissions-generating sectors include on-road transportation and building energy. The 2021 inventory serves as the city's GHG emissions baseline for the Climate Compass to forecast emissions and set emissions reduction targets. Table 1 and Figure 1 present the results of the city's 2021 community GHG emissions inventory by sector. A description of each emissions sector, including key sources of emissions, is provided in further detail in the *City of Elk Grove Climate Compass: Greenhouse Gas Inventory Update Technical Memorandum*.

Table 1 2021 Elk Grove Community GHG Emissions Inventory

Sector	GHG Emissions ($MTCO_2e$)	Percent of Total
On-Road Transportation	586,220	56%
Building Energy	398,365	38%
Solid Waste	20,222	2%
Off-Road Vehicles and Equipment	18,341	2%
Wastewater Treatment	2,957	<1%
Water Supply	2,802	<1%
Agriculture	10,275	1%
Total	**1,039,181**	**100%**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gases; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.



Source: Prepared by Ascent in 2023.

Figure 1 2021 City of Elk Grove Community GHG Emissions Inventory

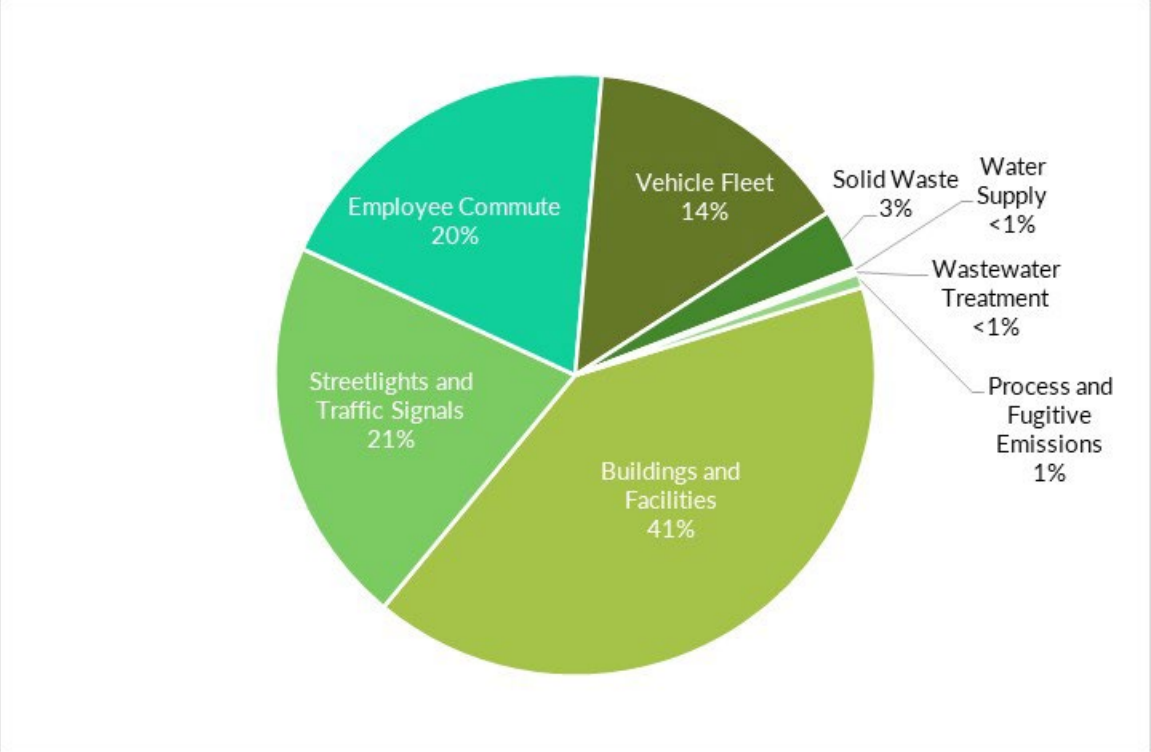
1.2 2021 CITY OF ELK GROVE'S OPERATIONS INVENTORY

Based on modeling conducted, COEG operations generated approximately 4,275 $MTCO_2e$ in 2021, which makes up less than one percent of the community emissions. Buildings and facilities, streetlights and traffic signals, and employee commute are the largest emissions-generating sectors. The 2021 City operations inventory serves as the baseline for forecasting COEG operations. Table 2 and Figure 2 present COEG's 2021 operations GHG emissions inventories by sector. A description of each emissions sector, including key sources of emissions, is provided in further detail in the *City of Elk Grove Climate Compass: Greenhouse Gas Inventory Update Technical Memorandum*.

Table 2 2021 City of Elk Grove Operations GHG Emissions Inventory

Sector	$MTCO_2e$	Percent of Total
Buildings and Facilities	1,741	41%
Streetlights and Traffic Signals	893	21%
Employee Commute	835	20%
Vehicle Fleet	620	14%
Solid Waste	139	3%
Water Supply	9	<1%
Wastewater Treatment	7	<1%
Process and Fugitive Emissions	32	1%
Total	**4,275**	**100%**

Notes: Totals may not sum exactly due to independent rounding. GHG = greenhouse gases; $MTCO_2e$ = metric tons of carbon dioxide equivalent.
Source: Data modeled by Ascent in 2023.



Source: Prepared by Ascent in 2023.

Figure 2 2021 City of Elk Grove Operations GHG Emissions Inventory

2 GREENHOUSE GAS EMISSIONS FORECASTS

The purpose of GHG emissions forecast for a CAP prepared by a local agency is to estimate how community and government operations GHG emissions may evolve in the future given changes in population and housing, economic growth, and local operations, and how state and federal legislation may help to reduce local emissions. Developing a GHG emissions forecast is an essential step in the climate action planning process, as it provides insight into what future emissions levels may be, and the necessary scale of action that may be needed in each GHG emissions sector to reduce emissions within local control for state GHG reduction target alignment.

The updated GHG emissions forecast prepared for the city is presented as a sector-level assessment of GHG emissions forecasts based on current conditions under two scenarios. The first scenario is a baseline scenario where GHG emissions grow from 2021 levels at the same rates as housing, population, employment, and vehicle travel, which is known as a business-as-usual scenario (BAU) forecast. The BAU forecast serves as a basis for understanding how emissions levels may change with growth, and how far GHG emissions will need to be reduced in future years to meet GHG reduction targets. The second scenario considers the local GHG reduction impact of state and federal legislation, which is known as a legislative adjusted business-as-usual scenario (legislative-adjusted BAU) forecast. The legislative-adjusted BAU forecast shows how currently adopted state and federal legislation can help the city to meet its GHG reduction targets.

As mentioned above, the Climate Compass uses an updated calendar year 2021 GHG emissions inventory for both the community and COEG operations (City of Elk Grove Climate Compass: Greenhouse Gas Inventory Update Technical Memorandum, completed November 2023), to provide a baseline for forecasting future emissions from the most recently available data.

2.1 COMMUNITY GREENHOUSE GAS EMISSIONS FORECASTS

The BAU GHG emissions forecasts provide an assessment of how emissions generated by community activities will change over time without further state, federal, regional, or local action. In addition to accounting for the city's population, employment, and land use change(s) under a BAU scenario, an adjusted BAU forecast (i.e., the legislative-adjusted BAU forecast) was prepared, which includes adopted policies and regulations at the state and federal levels that would affect emissions without any local action, such as regulatory requirements to increase vehicle fuel efficiency and increase renewable energy sources in grid electricity portfolios. These forecasts provide COEG with the information needed to focus efforts on certain emissions sectors and sources that have the greatest opportunities for GHG emissions reductions. It is important to note that the legislative-adjusted BAU forecasts only account for emissions reductions associated with adopted policies and regulations; they do not account for goals established by regional, state, and federal agencies or executive orders outside of adopted legislation and regulations.

The GHG emissions forecasts for 2030, 2035, 2040, 2045, and 2050 described in this section are aligned with the state's GHG reduction target years established in key legislation and policies, including Senate Bill (SB) 32 and Assembly Bill (AB) 1279, as well as the city's General Plan.

The adopted statewide GHG reduction targets and goals are:

- 40 percent below 1990 levels by 2030 (SB 32),
- 85 percent below 1990 levels by 2045 (AB 1279), and
- to achieve carbon neutrality no later than 2045 (AB 1279).

2.1.1 Activity Growth Forecast

The GHG emissions forecasts were based on projected changes in city demographics (i.e., population, employment, and service population [residents plus employees]) and land use between 2021 and 2050, which was provided by Fehr & Peers. These growth factors were used to forecast emissions for 2030, 2035, 2040, 2045, and 2050 for most sectors in the inventory. Additional information regarding growth factors used for each sector is included in the following sections.

Vehicle miles traveled (VMT) data were obtained from a VMT analysis conducted by Fehr & Peers using the EGSIM20 travel model. It considered daily VMT in the city and annualized the daily VMT using a factor of 334.[1] VMT estimates are associated with trips that begin or end in the city. VMT estimates included 100 percent of vehicle trips modeled to both originate from and end in the city (i.e., fully internal trips), 50 percent of trips that either end in or depart from the city (i.e., internal-external, or external-internal trips), and 0 percent of vehicle trips that are passing through the city boundaries (i.e., external-external, or "pass-through," trips). This vehicle trip accounting method is consistent with the Regional Targets Advisory Committee (RTAC) origin-destination method established through SB 375 and California Air Resources Board recommendations.

VMT estimates were provided for 2021 and forecasted for 2030, 2035 2040, 2045, and 2050. Table 3 shows anticipated growth in the city for the forecast years. It is important to note that 2021 VMT is for the city limits only but forecast years include the city limits and study areas to accommodate future annexures. Both the city limit and study area VMT estimates use the RTAC method.

Table 3 Elk Grove Community Demographic and Vehicle Miles Traveled Forecasts

Forecast Factor	2021	2030	2035	2040	2045	2050
Population	179,287	229,222	255,346	281,470	307,593	333,717
Households	55,507	70,967	79,055	87,142	95,230	103,318
Employment	46,757	71,638	84,538	97,437	110,336	123,235
Annual VMT	1,136,700,664	1,362,762,808	1,481,202,826	1,599,642,844	1,718,082,863	1,836,522,881
Annual VMT per capita	6,340	5,945	5,801	5,683	5,586	5,503

Notes: VMT = vehicle miles traveled.

Sources: Modeling conducted by Fehr & Peers in 2023.

STUDY AREAS INCLUDED IN GHG EMISSIONS FORECASTS

The growth in housing units and number of employees used in the GHG emissions forecast includes growth expected to occur in Elk Grove with the annexure of four study areas. Table 4 outlines reasonably foreseeable growth assumed in the city by 2050 within the city limits and study areas.

Table 4 Demographic Assumptions for 2050 Included in the GHG Emissions Forecast

Plan Area	Households	Employees
City Limit (Excluding East Study Area)	76,449	74,738
East Study Area	4,806	9,183
North Study Area	323	0
South Study Area	11,379	33,694
West Study Area	10,361	5,620
Total	**103,318**	**123,235**

Source: Modeling conducted by Fehr & Peers in 2023.

[1] This annualization factor comes from an analysis using Caltrans Performance Measurement System (PeMS) that determined the relationship between daily and annual volume for interstates in the Sacramento region.

2.1.2 Community Business-as-Usual Scenario Greenhouse Gas Emissions Forecast

For the community BAU forecast, the activity growth in each emissions sector was scaled using the appropriate growth scaling factors without considering the local GHG reduction impact of the state and federal legislation. The results of the community BAU forecast show that community GHG emissions would be expected to grow through 2050, given no further GHG reduction efforts beyond 2021, as shown in Table 5. Emissions are presented in units of metric tons of carbon dioxide equivalent ($MTCO_2e$). While a more realistic scenario for future GHG emissions can be provided with a legislative-adjusted BAU forecast, the BAU provides the basis for understanding the GHG impact of growth in the city.

Table 5 Elk Grove Community GHG Emissions Inventory and BAU Forecasts ($MTCO_2e$)

Sector	2021	2030	2035	2040	2045	2050
On-Road Transportation	586,220	718,743	787,865	856,987	926,109	995,231
Residential Building Energy	271,900	347,631	387,249	426,868	466,486	506,104
Nonresidential Building Energy	126,465	193,762	228,650	263,539	298,428	333,316
Solid Waste	20,222	26,034	29,411	32,788	36,165	39,542
Off-Road Vehicles and Equipment	18,341	25,296	28,917	32,537	36,158	39,778
Agriculture[1]	10,275	4,372	1,154	1,154	1,154	1,154
Wastewater Treatment	2,957	6,707	7,577	8,447	9,317	10,187
Water Supply	2,802	3,731	4,214	4,698	5,183	5,666
Total	**1,039,181**	**1,326,277**	**1,475,038**	**1,627,018**	**1,779,000**	**1,930,979**
Percent Change from 2021 Levels	N/A	28%	42%	57%	71%	86%

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

[1] Agricultural emissions are anticipated to decrease under the business-as-usual forecast because the acres in agricultural production in the city limits are anticipated to decrease over the coming decades.

Source: Data modeled by Ascent in 2023.

2.1.3 Community Legislative-Adjusted Business-as-Usual Scenario Greenhouse Gas Emissions Forecast

Legislative-adjusted BAU emissions forecasts were prepared using the same demographic and VMT data that were used for the BAU forecasts, while also accounting for state and federal policies and regulations that would affect local emissions. For example, growth in residential building electricity consumption was scaled using housing units as the growth scaling factor, and a legislative reduction was applied to incorporate the California Code of Regulations, Title 24, Part 6 building energy efficiency standards for new development. The GHG reductions considered in the legislative-adjusted BAU forecast fall generally into four categories: building energy efficiency standards, fuel efficiency standards, electric vehicle sales requirements, and renewable and zero carbon electricity requirements. The primary drivers of the emissions reductions are the requirements of SB 100 and SB 1020, as well as increased electric vehicle penetration from the Advanced Clean Cars II (ACC II) regulation. These forecasts provide COEG with a more robust understanding of future community emissions to assist with the prioritization of emissions reduction measures developed to meet GHG targets. The full list of legislation considered is provided in Table 6.

In January 2025, the California Air Resources Board (CARB) rescinded its application to the US Environmental Protection Agency for a Clean Air Act waiver for its Advanced Clean Fleet (ACF) regulation. ACF would have allowed CARB to regulate medium- and heavy-duty truck fleets in the state to achieve more stringent zero-emission targets

that are not required under the federal regulations. While the implications of the rescinded application for the ACF regulation on private fleet operators are unknown (at time of writing), ACF still applies to local government and state-operated fleets. Due to the uncertainty around ACF compliance, the community legislative-adjusted BAU forecast does not account for ACF, but ACF is accounted for in the COEG legislative-adjusted BAU forecast.

Table 6 Federal and State Legislative Reductions Applied under the Legislative-Adjusted BAU Scenario

Source	Legislative Reduction	Description	Sectors Applied
State	SB 100 (The 100 Percent Clean Energy Act of 2018)	Requires that 60 percent of retail electricity sold in California must come from renewable or zero-carbon resources by 2030 and 100 percent by 2045.	Building Energy
State	SB 1020 (Clean Energy, Jobs, and Affordability Act of 2022)	Requires that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all state agencies by December 31, 2035.	Building Energy
State	California's Building Energy Efficiency Standards (2019 and 2022 Title 24, Part 6)	Effective January 1, 2023, new residential and nonresidential buildings in California are required to comply with energy efficiency standards established by the California Energy Commission (CEC 2022). The 2022 standards establish energy performance requirements that require energy-efficient approaches to building decarbonization by emphasizing electric heat pumps for space heating and water heating and extending the benefits of photovoltaic and battery storage systems and other demand flexible technology to work in combinations with heat pumps.	Building Energy
State	Advanced Clean Car I Regulations	Establishes GHG emission reduction standards for model years 2017 through 2025 that are more stringent than federal CAFE standards.	On-Road Vehicles
State	Advanced Clean Cars II Regulations[1]	Establishes a target for all new passenger cars, trucks, and SUVs sold in California to be 100 percent zero-emission vehicles by 2035.	On-Road Vehicles
State	Truck and Bus Regulation	Requires diesel trucks and buses that operate in California to be upgraded to reduce GHG emissions.	On-Road Vehicles
Federal	Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles	Establishes fuel efficiency standards for medium- and heavy-duty engines and vehicles.	On-Road Vehicles
Federal	EPA Off-Road Compression-Ignition Engine Standards	Establishes standards for phasing of EPA diesel engine tiers for off-road compression-ignition equipment.	Off-Road Vehicles and Equipment

Notes: CAFE = Corporate Average Fuel Economy; CEC = California Energy Commission; EPA = US Environmental Protection Agency; GHG = greenhouse gas; SUV = sports utility vehicle; SB = Senate Bill.

[1] As of June 2025, the U.S. Congress voted to limit California's authority to regulate vehicle emissions under existing programs provided through a waiver of the Clean Air Act. California is challenging the legality of this vote and given the pending litigation, the assumption of these programs remains for the purpose of the Elk Grove *Climate Compass*.

Source: Compiled by Ascent in 2025.

The results of community legislative-adjusted BAU forecasts show that emissions are expected to decline through 2050, as shown in Table 7.

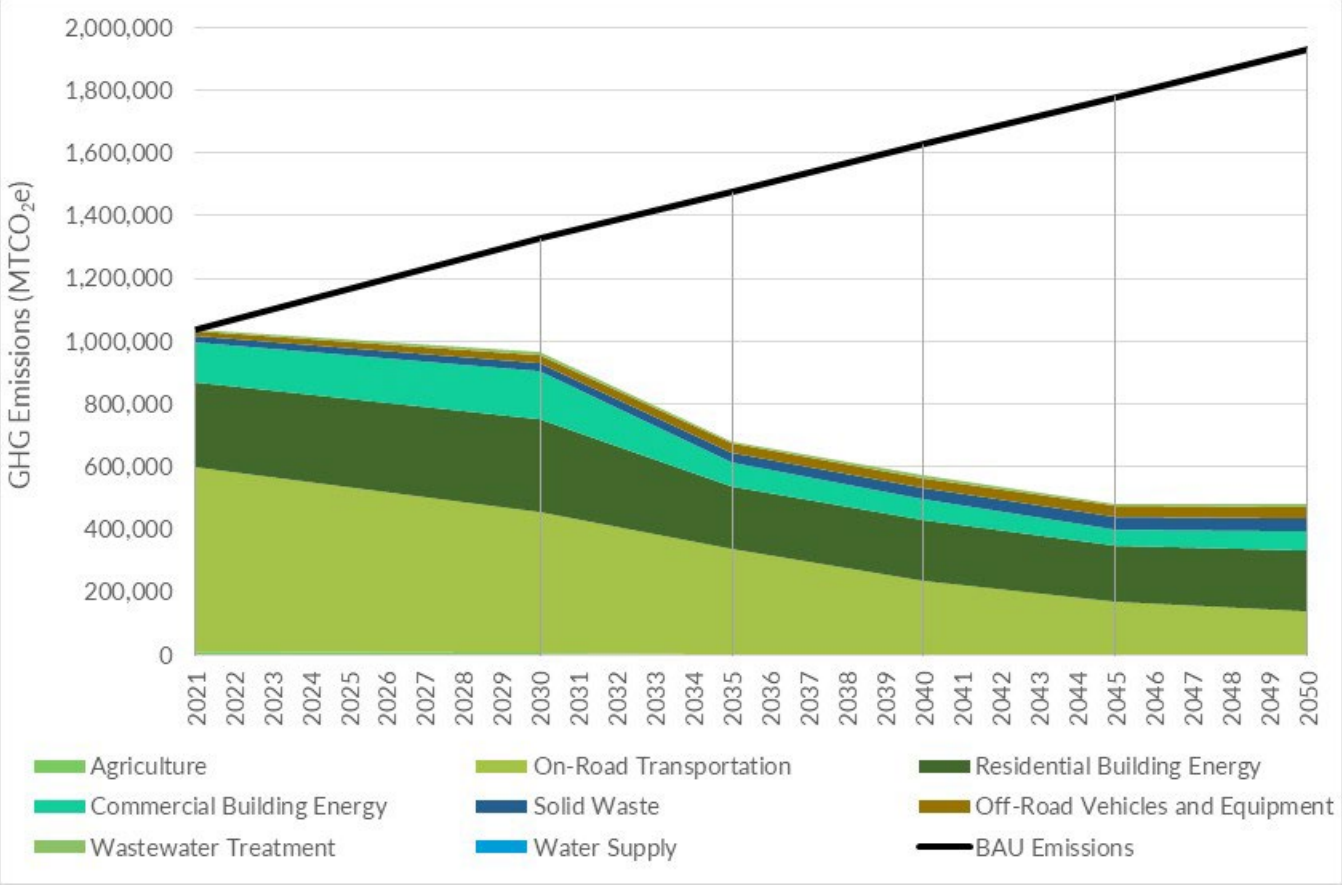
Table 7 Elk Grove Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Sector	2021	2030	2035	2040	2045	2050
On-Road Transportation	586,220	449,118	338,377	237,241	166,840	140,825
Residential Building Energy	271,900	299,782	199,731	191,876	178,777	190,410
Nonresidential Building Energy	126,465	152,746	77,061	68,787	55,643	61,825
Solid Waste	20,222	26,034	29,411	32,788	36,165	39,542
Off-Road Vehicles and Equipment	18,341	25,296	28,917	32,537	36,158	39,778
Agriculture	10,275	3,869	686	630	575	575
Wastewater Treatment	2,957	6,707	7,577	8,447	9,317	10,187
Water Supply	2,802	2,875	812	453	0	0
Total	**1,039,181**	**966,427**	**682,572**	**572,760**	**483,474**	**483,143**
Percent Change from 2021 Levels	N/A	-7%	-34%	-45%	-53%	-54%

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Source: Data modeled by Ascent in 2025.

The community BAU and legislative-adjusted BAU forecast results presented together demonstrate the impact of the state and federal legislation on the city's community GHG emissions profile over time, as shown in Figure 3.



Source: Prepared by Ascent in 2025.

Figure 3 Elk Grove Community GHG Emissions Inventory and Forecasts

2.1.4 Discussion

As shown in Table 7 and Figure 3, the city's legislative-adjusted BAU community emissions would decrease modestly by approximately 7 percent between 2021 and 2030 and would see an accelerated decrease after 2030 through 2045. Between 2021 and 2045, emissions are expected to decrease by 53 percent. However, forecasted reductions are expected to level out by 2050. This is primarily due to the continued increase in natural gas in residential and nonresidential buildings. Electricity-related emissions would continue to be zero through 2050 and the city would continue to see a moderate decrease in on-road transportation emissions due to ACCII. With these anticipated trends, building energy (residential and nonresidential building combined) would replace on-road transportation as the largest emissions-generating sector in the city, accounting for more than 50 percent of total emissions through 2045. On-road transportation is also expected to contribute to emissions significantly, accounting for 35 percent of emissions in 2045.

Without legislative adjustments, BAU emissions would increase baseline emissions by approximately 28 percent between 2021 and 2030 and 86 percent between 2021 and 2050. The relatively lower increase under the legislative-adjusted BAU forecast scenario in 2030, despite significant growth projected in the city, is associated with reductions that would be achieved from several legislative actions, including:

- a greater renewable mix in electricity (60 percent by 2030, 90 percent by 2035, 95 percent by 2040, and 100 percent by 2045 and 2050),
- improved building energy efficiency through compliance with Title 24 standards, and
- reductions in on-road vehicle emissions factors from state vehicle standards as forecasted in EMFAC2021 and ACCII.

Going forward, new legislative actions that would affect emissions may be adopted by regional, state, and federal agencies; however, because information regarding these regulatory changes is currently unknown, emissions reductions from future potential legislative actions are not quantified in this memorandum. Where new regulations or actions are imminent and reasonably foreseeable, they can be incorporated as complementary actions to locally based GHG reduction measures.

2.2 CITY OF ELK GROVE OPERATIONS GREENHOUSE GAS EMISSIONS FORECASTS

The estimated COEG operations BAU emissions forecast was based on projected growth in COEG employment between 2021 and 2045 and is based on the emissions levels of the 2021 COEG operations GHG emissions inventory (City of Elk Grove Climate Compass: Greenhouse Gas Inventory Update Technical Memorandum).

2.2.1 Activity Growth Forecast

The number of COEG employees was the sole factor used to forecast BAU emissions for 2030 and 2045 for all sectors in the COEG operations inventory. Table 8 shows 2021 COEG employment and anticipated change in COEG employment for the forecast years.

Table 8 City of Elk Grove City Operations Demographic Forecasts

Forecast Factor	2021	2030	2045
City Employment	424	561	727

Source: Data provided by City of Elk Grove; calculations by Ascent in 2023.

2.2.2 City of Elk Grove Operations Business-as-Usual Scenario Greenhouse Gas Emissions Forecast

COEG operations BAU forecast was developed by scaling COEG operations GHG emissions from the 2021 emissions inventory by the growth in number of employees. The results of COEG operations BAU forecast show that emissions would be expected to grow, given no further GHG reduction efforts beyond 2021, as shown in Table 9. While a more realistic scenario for future GHG emissions can be provided with a legislative-adjusted BAU forecast, the BAU provides the basis for understanding the GHG impact of growth at COEG.

Table 9 City of Elk Grove Operations GHG Emissions Inventory and BAU Forecasts (Annual $MTCO_2e$)

Sector	2021	2030	2045
Buildings and Facilities	1,741	2,304	2,987
Streetlights and Traffic Signals	893	1,136	1,532
Employee Commute	835	1,104	1,432
Vehicle Fleet	620	820	1,064
Solid Waste	139	184	239
Process and Fugitive Emissions	32	42	55
Water Supply	9	12	16
Wastewater Treatment	7	8	11
Total	**4,275**	**5,611**	**7,334**
Percent Change from 2021 Levels	*N/A*	*+31%*	*+72%*

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Source: Data modeled by Ascent in 2023.

2.2.3 City of Elk Grove Operations Legislative-Adjusted Business-as-Usual Scenario Greenhouse Gas Emissions Forecast

COEG operations legislative-adjusted BAU forecast was developed by accounting for the expected GHG reductions in COEG operations GHG emissions incorporating new State and federal legislation, such as SB 100, SB 1020, ACC II, ACF. The full list of legislation considered is provided in Table 10. The results of COEG operations legislative-adjusted BAU forecasts show that emissions are expected to slightly increase by 2030 with the city's rapid population growth and then decline by 2045 with the zero-carbon electricity legislation under SB 100. Legislative-adjusted BAU forecast results are shown in Table 11 and Figure 4.

Table 10 Buildings and Facilities Energy Emissions Forecast Legislative Reductions by Energy Type

Source	Legislative Reduction	Description	Sectors Applied
State	SB 100 (The 100 Percent Clean Energy Act of 2018)	Requires that 60 percent of retail electricity sold in California must come from renewable or zero-carbon resources by 2030 and 100 percent by 2045.	Buildings and Facilities; Streetlights and Traffic Signals
State	SB 1020 (Clean Energy, Jobs, and Affordability Act of 2022)	Requires that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all State agencies by December 31, 2035.	Buildings and Facilities; Streetlights and Traffic Signals

Source	Legislative Reduction	Description	Sectors Applied
State	Advanced Clean Car I Regulations	Establishes GHG emission reduction standards for model years 2017 through 2025 that are more stringent than federal CAFE standards.	Vehicle Fleet; Employee Commute
State	Advanced Clean Cars II Regulations[1]	Establishes a target for all new passenger cars, trucks, and SUVs sold in California to be 100 percent zero-emission vehicles by 2035.	Vehicle Fleet; Employee Commute
State	Truck and Bus Regulation	Requires diesel trucks and buses that operate in California to be upgraded to reduce GHG emissions.	Vehicle Fleet
Federal	Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles	Establishes fuel efficiency standards for medium- and heavy-duty engines and vehicles.	Vehicle Fleet; Employee Commute
State	Advanced Clean Fleets[2]	Except for small government fleets of 10 or fewer vehicles and those in designated counties, starting in 2024, state and local agencies would be required to ensure 50% of vehicle purchases are zero emissions. This requirement is increased to 100% starting in 2027.	Vehicle Fleet

Notes: CAFE = Corporate Average Fuel Economy; GHG = greenhouse gas; SB = Senate Bill.

[1] As of June 2025, the U.S. Congress voted to limit California's authority to regulate vehicle emissions under existing programs provided through a waiver of the Clean Air Act. California is challenging the legality of this vote and given the pending litigation, the assumption of these programs remains for the purpose of the Elk Grove *Climate Compass*.

[2] On January 13, 2025, CARB withdrew its request for a waiver and authorization for the addition of the Advanced Clean Fleets (ACF) Regulation to its emissions control program. As of June 2025, CARB is evaluating next steps and is not enforcing the existing portions of the ACF Regulation that require a federal waiver or authorization, such as the portions of the ACF Regulation that apply to high priority and drayage fleets. However, not all elements of the ACF Regulation require a federal waiver or authorization and the State and local government fleets portion of the ACF Regulation remains unaffected. The ACF Regulation is only applied to the City of Elk Grove government operations' emissions forecast.

Source: Compiled by Ascent in 2025.

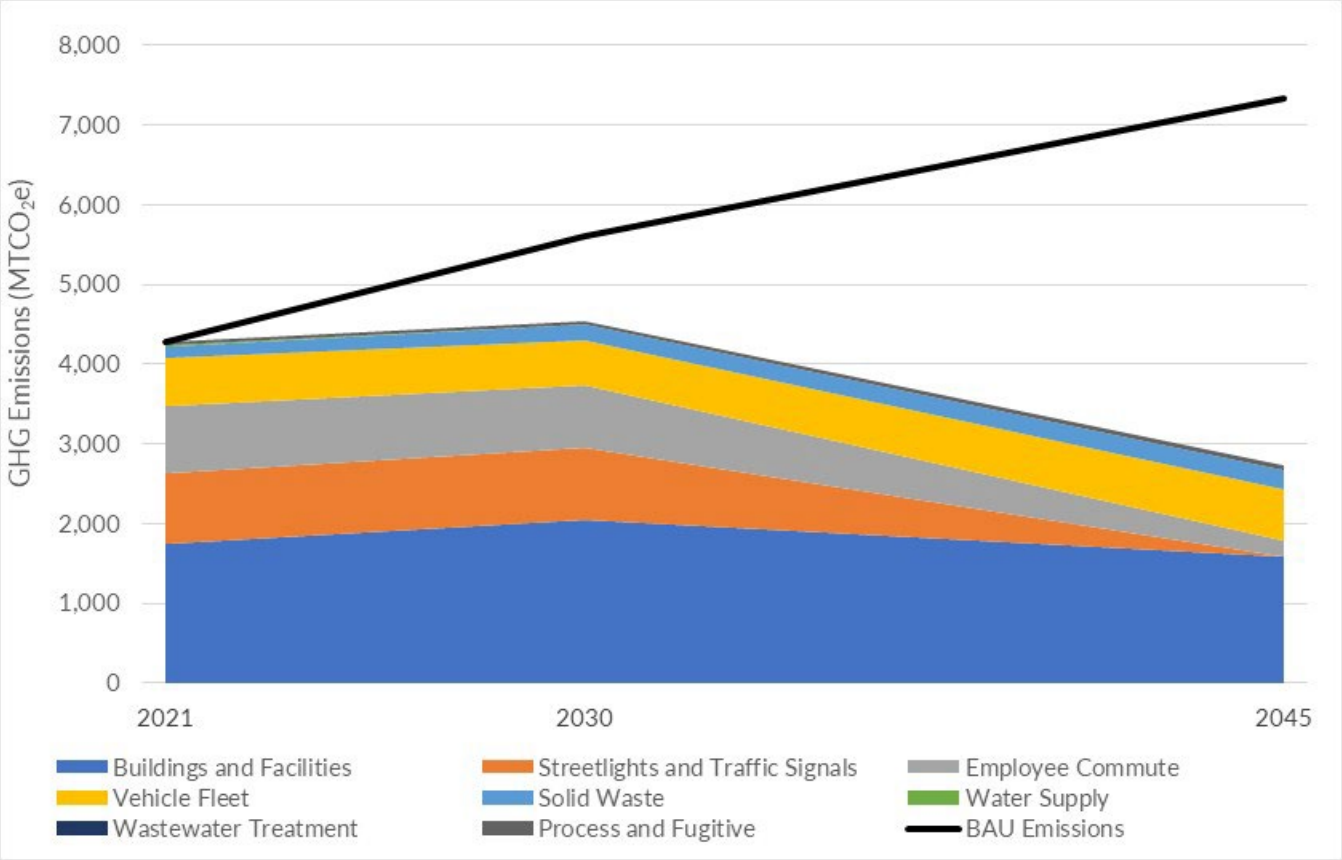
Table 11 City of Elk Grove Operations GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Sector	2021	2030	2045
Buildings and Facilities	1,741	2,054	1,588
Streetlights and Traffic Signals	893	907	0
Employee Commute	835	769	201
Vehicle Fleet	620	578	646
Solid Waste	139	184	239
Water Supply	9	9	0
Wastewater Treatment	7	7	3
Process and Fugitive	32	42	55
Total	**4,275**	**4,550**	**2,732**
Percent Change from 2021 Levels	*N/A*	*+6%*	*-36%*

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

Source: Data modeled by Ascent in 2025.

Figure 4 also shows the emissions trend that would occur without anticipated legislative reductions, accounting only for changes in COEG employment (i.e., BAU emissions). Without the legislative reductions, emissions would be higher in 2045 compared to the legislative-adjusted BAU forecast.



Source: Prepared by Ascent in 2025.

Figure 4 City of Elk Grove Operations GHG Emissions Inventory and Forecasts

2.2.4 Discussion

As shown in Table 11 and Figure 4, COEG's operational legislative-adjusted BAU emissions would increase by approximately 6 percent in 2030 and then decrease by 36 in 2045 compared to 2021. This reduction in emissions would be achieved from several legislative actions including:

- a greater renewable mix in electricity (100 percent by 2045),
- improved building energy efficiency through compliance with Title 24 standards, and
- reductions in on-road vehicle emissions factors from state vehicle standards as forecasted in EMFAC2021, ACC II, and ACF standards.

Going forward, new legislative actions that would affect emissions may be adopted by state and federal agencies; however, because information regarding these regulatory changes is currently unavailable or not final, emissions reductions from future potential legislative actions are not quantified in this forecast. Where new state regulations or programs are imminent and reasonably foreseeable, they can be incorporated as complementary actions to locally based GHG reduction measures.

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CEC. *See* California Energy Commission.

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Attachment A

City of Elk Grove Climate Compass: Final Greenhouse Gas Emissions Forecasts Technical Memorandum

INTRODUCTION

This document is an appendix to the City of Elk Grove (COEG) Climate Compass: Final Greenhouse Gas Emissions Forecasts Technical Memorandum (hereafter referred to as "Forecast Memorandum") to provide technical documentation for the results presented in the memorandum. This document presents the summary of the community and COEG operations emissions forecasts and explains the forecast methodology.

1 GREENHOUSE GAS EMISSIONS FORECASTS METHODOLOGY

For estimating community forecast, the 2021 community greenhouse gas (GHG) emissions are forecasted for 2030, 2035, 2040, 2045, and 2050 based on growth scaling factors and known impacts of currently adopted legislation on GHG emissions (e.g., adopted federal and California regulations, policies, and programs affecting fuels and energy efficiency). The growth scaling factors (e.g., population, housing, employment, and service population[1]) are applied to activity growth factors (electricity consumption per housing unit and vehicle miles traveled [VMT] per service population).

For estimating COEG operations forecast, the 2021 COEG operations GHG emissions are forecasted for 2030 and 2045 based on number of COEG employees and known impacts of currently adopted legislation on GHG emissions. These future growth factors were applied to the electricity, natural gas, water consumption, and waste generation in COEG buildings and facilities and fuel consumed by COEG's on-road vehicle fleet and employee commute.

The following section describes the methodology behind forecasting both the community and COEG operations business-as-usual (BAU) and legislative-adjusted BAU emissions for each sector. The BAU emissions forecast provides an assessment of how emissions generated by activities in the city will change over time without further state or federal action. The legislative-adjusted BAU emissions forecast includes adopted legislative and regulatory actions at the state and federal levels that would affect emissions without additional action.

1.1 COMMUNITY GREENHOUSE GAS EMISSIONS FORECASTS

1.1.1 Business-as-Usual Forecast

The community BAU forecasted emissions are estimated by scaling the 2021 baseline emissions by four growth scaling factors: housing, population, employment, and service population in the city. These scaling factors are used as a basis for the forecasts of activity for most sectors. The scaling factors are assigned to different activities for emissions sectors and sub-sectors depending on how each sector or sub-sector is affected. These assignments are shown in Table 1. For example, the activity for both the residential building energy sector and the nonresidential building energy sector is in kilowatt-hours (kWh) of electricity and therms of natural gas. Increases in residential building energy (in kWh and therms) are assumed to be proportional to the growth in households, whereas increases in nonresidential building energy (also in kWh and therms) are assumed to be proportional to the growth in employment. These projections in the activities are then translated to emissions using 2021 emission factors to represent the BAU scenario. Under the BAU scenario, it is assumed that baseline emission factors remain unchanged in the future. The resulting scaled activity growth factor are shown in Table 2.

[1] Service population is the sum of population and number of employment in the city.

Table 1 Community BAU Growth Scaling Methods by Emissions Sector for Community Forecast

Sector	Sub-Sector	Activity Growth Method
Building Energy	Nonresidential	Employment
	Residential	Population
	Backup Generator	Employment
On-Road	Passenger	Estimated VMT forecast
	Commercial	Estimated VMT forecast
Off-Road	Construction Equipment[1]	Service Population
	Industrial	Employment
	Lawn and Garden Equipment	Population
	Light Commercial Equipment	Employment
	Portable Equipment	Employment
	Recreational Equipment	Population
	Transport Refrigeration Units	Service Population
Solid Waste	Waste Generation	Service Population
Wastewater Treatment	Septic System	Service Population
	Waste Water Treatment Plant (WWTP)	Service Population
Agriculture	Fertilizer Application	Agricultural Acres
	Irrigation Pumps	Agricultural Acres
	Livestock	Agricultural Acres
	Agricultural Offroad	Agricultural Acres
	Agricultural Building Energy	Agricultural Acres
Water Supply	NA	Service Population

Notes: BAU = business-as-usual; kWh = kilowatt-hours; NA = not applicable; VMT = vehicle miles traveled

[1] This is part of the "construction and mining" combined category in CARB's OFFROAD model. Mining does not occur within the city, therefore this subsector is used to represent the construction-related emissions in the city.

Source: Compiled by Ascent in 2023.

Table 2 Community BAU Activity Data Forecast by Emissions Sector

Sector	Source	Quantity Type	Quantity Units	2030 Quantity	2035 Quantity	2040 Quantity	2045 Quantity	2050 Quantity
Building Energy	Residential	Electricity	kWh	789,582,752	879,568,854	969,554,956	1,059,541,058	1,149,527,159
	Nonresidential	Electricity	kWh	637,878,776	752,734,947	867,591,117	982,447,288	1,097,303,459
	Electricity Total		kWh	1,427,461,528	1,632,303,800	1,837,146,073	2,041,988,346	2,246,830,618
	Residential	Natural Gas	therms	29,225,349	32,556,064	35,886,780	39,217,495	42,548,210
	Nonresidential	Natural Gas	therms	7,225,582	8,526,617	9,827,652	11,128,687	12,429,722
	Natural Gas Total		therms	36,450,931	41,082,681	45,714,431	50,346,182	54,977,932
	Backup Generators (Nonresidential)	Diesel	gal	10,663	12,583	14,503	16,423	18,343
	Backup Generators (Nonresidential)	Natural Gas	therms	214	252	291	329	368
	Backup Generators (Nonresidential)	LPG	gal	174	205	237	268	300

Sector	Source	Quantity Type	Quantity Units	2030 Quantity	2035 Quantity	2040 Quantity	2045 Quantity	2050 Quantity
On-Road Transportation	On-Road Passenger Transportation	Annual VMT	miles	1,114,891,221	1,204,569,915	1,294,248,608	1,383,927,302	1,473,605,996
	On-Road Commercial Transportation	Annual VMT	miles	247,871,587	276,632,912	305,394,236	334,155,561	362,916,885
	On-Road Total	Annual VMT	miles	1,362,762,808	1,481,202,826	1,599,642,844	1,718,082,863	1,836,522,881
Off-Road Vehicles and Equipment [1]	NA	NA	NA	NA	NA	NA	NA	NA
Solid Waste	Community-Generated Solid Waste	Waste	tons	86,100	97,268	108,435	119,603	130,770
	Compost	Waste	tons	32,582	36,808	41,034	45,260	49,486
	Solid Waste Total	Waste	tons	118,682	134,076	149,469	164,863	180,256
Water Supply	Elk Grove Water District	Electricity	kWh	3,623,489	4,093,471	4,563,452	5,033,434	5,503,415
	Sacramento County Water Agency	Electricity	kWh	11,709,337	13,228,086	14,746,835	16,265,584	17,784,333
	Wells	Electricity	kWh	11,694	13,211	14,728	16,244	17,761
	Water Supply Total	Electricity	kWh	15,344,520	17,334,768	19,325,015	21,315,262	23,305,509
Wastewater Treatment [2]	NA	NA	NA	NA	NA	NA	NA	NA
Agriculture	Fertilizer Application (Lime)	NA	tons	13	3	3	3	3
	Fertilizer Application (Nitrogen)	NA	tons	133	35	35	35	35
	Off-Road Agricultural Equipment	NA	NA	NA	NA	NA	NA	NA
	Diesel-Powered Irrigation Pumps	Pumps	NA	1	0	0	0	0
	Cattle and Calves	Heads	NA	246	65	65	65	65
	Sheep and Lambs	Heads	NA	57	15	15	15	15
	Goats	Heads	NA	64	17	17	17	17
	Poultry	Heads	NA	78	21	21	21	21
	Swine	Heads	NA	4	1	1	1	1
	Horses	Heads	NA	31	8	8	8	8
	Agricultural Building Energy	Electricity	kWh	9,022,676	2,381,934	2,381,934	2,381,934	2,381,934

Notes: BAU = business-as-usual; gal = gallon; kWh = kilowatt-hours; NA = not applicable; VMT = vehicle miles traveled.

[1] Activity data has not been scaled for Off-Road Vehicles and Equipment. CARB's 2021 OFFROAD model was used to estimate emissions forecasts.

[2] Activity data has not been scaled for Wastewater Treatment. Forecast emissions are estimated by scaling 2021 inventory emissions directly.

Source: Data modeled by Ascent in 2023.

1.1.2 Legislative-Adjusted Business-as-Usual Forecast

The legislative-adjusted BAU scenario accounts for the effect of adopted legislative and regulatory actions at the state and federal levels on local emissions without additional action by COEG. For the building energy sector, legislative reductions affect energy use through energy efficiency standards and electricity emission factors to account for increased zero-carbon requirements for the electricity sector. For on-road transportation, agricultural building energy sub-sector, and water supply sectors, legislative reductions affect emissions factors only. For solid waste, wastewater treatment, off-road vehicles and equipment, and agriculture sectors (excluding agricultural building energy sub-sector), the legislative-adjusted BAU forecast is equivalent to the BAU forecast. Although legislation exists that would affect these sectors (e.g., Senate Bill [SB] 1383 would impact the solid waste sector), there is not sufficient information to quantify the legislative reductions from these sectors. As such, any additional GHG reductions in these sectors would be factored as part of local actions as part of the Climate Compass's GHG reduction measures and not as part of the forecasts.

Table 6 in the Forecast Memorandum presents a summary of the legislative adjustments applied to the activity data and emissions factors by sector under the legislative-adjusted BAU scenario. Table 3 below lists community forecast sectors where activity data is affected by legislative reductions. A detailed discussion of each sector is provided in Section 1.1.3.

Table 3 Community Legislative-Adjusted BAU Activity Data Forecast by Emissions Sector Affected by Legislative Reductions

Sector	Source	Quantity Type	Quantity Units	2030 Quantity	2035 Quantity	2040 Quantity	2045 Quantity	2050 Quantity
Building Energy	Residential	Electricity	kWh	831,404,941	943,270,190	1,055,135,440	1,167,000,689	1,278,865,939
	Nonresidential	Electricity	kWh	616,743,756	720,642,952	824,542,148	928,441,344	1,032,340,540
	Electricity Total		kWh	1,448,148,697	1,663,913,142	1,879,677,588	2,095,442,034	2,311,206,479
	Residential	therms	therms	27,037,421	29,223,528	31,409,635	33,595,742	35,781,850
	Nonresidential	therms	therms	6,949,873	8,107,973	9,266,073	10,424,173	11,582,273
	Natural Gas Total		therms	33,987,294	37,331,501	40,675,708	44,019,915	47,364,122
	Backup Generators (Nonresidential)	Diesel	gal	10,663	12,583	14,503	16,423	18,343
	Backup Generators (Nonresidential)	Natural Gas	therms	214	252	291	329	368
	Backup Generators (Nonresidential)	LPG	gal	174	205	237	268	300

Notes: BAU = business-as-usual; gal = gallon; kWh = kilowatt-hours; LPG = liquid propane gas.

Data modeled by Ascent in 2025.

1.1.3 Forecast Details by Emissions Sector

BUILDING ENERGY

Building Energy Assumptions

Building energy emissions in the city result directly from onsite combustion of natural gas and indirectly from electricity consumption. The combustion of fossil fuels (i.e., diesel, liquid propane gas [LPG], propane and natural gas) in backup generators also contributes to the city's building energy emissions. This section presents the methodology behind forecasting the energy consumption for residential and nonresidential sources and estimating future emission

factors. BAU forecasted energy consumption for residential building energy is estimated by scaling 2021 energy consumption using population. For nonresidential sources, BAU forecasted energy consumption is estimated by scaling 2021 energy consumption using employment. BAU forecasted energy consumption in buildings using backup generators is estimated by scaling 2021 energy consumption using employment. The BAU forecast uses the GHG emissions factors used to calculate emissions in the 2021 inventory for all forecast years. The legislative-adjusted BAU forecast considers the effects of legislation on energy use in new residential and nonresidential buildings pursuant to California's Building Energy Efficiency Standards (California Code of Regulations Title 24 Part 6, hereafter referred to as "Title 24"). The legislative-adjusted BAU forecast also considers changes to the carbon intensity of electricity generation under SB 100 and SB 1020 that would affect future electricity emission factors. Emissions are calculated by multiplying the annual projected building energy use by the respective emission factors.

Emission Factor Forecasts

Electricity

Sacramento Municipal Utility District (SMUD) provides all electricity in the city. Under BAU forecasts, SMUD's 2021 electricity supply emissions factor is assumed to remain unchanged through 2045 because the BAU forecast does not account for the effects of SB 1020 and SB 100 beyond the inventory year (2021). According to The Climate Registry (TCR), SMUD's emissions factor in 2021 was 535 pounds of carbon dioxide equivalent per megawatt-hour and represented a 48 percent carbon-free electricity mix (TCR 2021), meaning that 48 percent of the electricity generated by SMUD in 2021 was generated by sources that emit no GHG emissions.

Under the legislative-adjusted BAU forecasts, SMUD's carbon-free mix for 2030 through 2050 is set to align with the mandates outlined in SB 1020 and SB 100. Thus, under legislative-adjusted BAU forecast, the emissions factors align with California Public Utilities Commission's Renewables Portfolio Standard (RPS) which are set through SB 1020 and SB 100 (see Emission Factor Forecasts in Forecast Details by Emissions Sector 1.1.3 for details). Through SB 100, RPS requires that "all electricity providers procure a minimum 60% eligible renewable energy by 2030" (State of California 2023a). And through SB 1020, RPS requires that "eligible renewable energy resources and zero-carbon resources supply 90% of electricity to end-use customers by 2035, 95% by 2040, and 100% by 2045" (State of California 2023b). Given that SB 1020 and SB 100 have set 2045 as the ultimate target year by which carbon-free electricity mix is achieved and the heavy investments needed to achieve that target, the 100-percent GHG-free mix was assumed to continue from 2045 through 2050. To calculate future emission factors, SMUD's 2021 electricity supply emissions factor was adjusted to reflect the additional carbon-free electricity mix percentage to meet the minimum RPS standards. As a result, the legislative-adjusted BAU emission factors for all future years are estimated by incorporating SMUD's 2021 carbon-free electricity mix for each forecast year and carbon-free mix set by RPS standard. The emission factors and carbon-free mix of electricity and associated GHG emissions factors for the legislative-adjusted BAU forecast are presented in Table 4.

Table 4 Emission Factors and Carbon-Free Mix of Electricity Used in Elk Grove

	2021	2030	2035	2040	2045	2050
Emission Factor (lb CO_2e/MWh)	536	413	103	52	0	0
Carbon-Free Electricity Mix (%)	48	60	90	95	100	100

Notes: lb CO_2e/MWh = pounds of carbon dioxide equivalent per megawatt-hour.

Source: Compiled by Ascent in 2023.

Natural Gas

Natural gas in the city is provided by Pacific Gas & Electric (PG&E). According to TCR, 11.73 pounds of carbon dioxide equivalent is released for every therm of natural gas combusted (TCR 2021). Emissions factors associated with natural gas combustion are not anticipated to change over time, as there are no legislative actions that would reduce the carbon intensity of natural gas. The emission factors of natural gas for PG&E supplied natural gas are presented in Table 5.

Table 5 Natural Gas Emission Factors in (lb CO_2e/therm) Used in Elk Grove

Provider	2021	2030	2035	2040	2045	2050
PG&E	11.73	11.73	11.73	11.73	11.73	11.73

Notes: PG&E = Pacific Gas and Electric Company; lb CO_2e/therm = pounds of carbon dioxide equivalent per therm.

Source: Compiled by Ascent in 2023.

Backup Generator Fuel

Emissions from diesel fuel used to power backup generators are based on emissions factors obtained from TCR, using a regional-specific average consumption of 22.55 pounds of carbon dioxide equivalent per gallon (lb CO_2e/gal). Emissions factors associated with diesel combustion are not anticipated to change over time, as there are no legislative actions that would reduce the carbon intensity of diesel.

Emissions from propane and LPG used to power backup generators are also based on emissions factors from TCR and are estimated to be 0.9 lb CO_2e/gal and 0.34 pounds of carbon dioxide equivalent per standard cubic feet, respectively. These emissions factors are also not anticipated to change over time, as there are no legislative actions that would reduce the carbon intensity of propane and LPG. The emission factors of backup generator fuels are presented in Table 6.

Table 6 Backup Generator Fuel Emission Factors Used in the City of Elk Grove

Provider	Units	2021	2030	2035	2040	2045	2050
Diesel	lb CO_2e/gal	22.55	22.55	22.55	22.55	22.55	22.55
Propane	lb CO_2e/gal	0.9	0.9	0.9	0.9	0.9	0.9
LPG	lb CO_2e/scf	0.34	0.34	0.34	0.34	0.34	0.34

Notes: lb CO_2e/gal = pounds of carbon dioxide equivalent per gallon; lb CO_2e/scf = pounds of carbon dioxide equivalent per standard cubic foot.

Source: Compiled by Ascent in 2023.

ENERGY USE FORECASTS

For new buildings, energy use is adjusted to reflect increased stringency under Title 24. Title 24 standards apply to new construction. The 2019 Title 24 standards apply to projects constructed after January 1, 2020; 2022 Title 24 standards apply to projects constructed after January 1, 2023; and the next standards will apply after January 1, 2026. To estimate adjusted future energy consumption resulting from Title 24 requirements in new residential and nonresidential building construction, electricity- and natural gas-specific adjustment factors are calculated using the difference in the average energy use in residential and nonresidential buildings between those built to 2019 Title 24 standards and those built to 2022 Title 24 standards. Adjustment factors are calculated using data available from the California Energy Commission (CEC) that were developed for the 2022 Title 24 standards. In addition to accounting for Title 24 requirements by land use type (i.e., residential and nonresidential), CEC also developed estimates for energy usage rates by climate zone, and the county's climate zone (Zone 12) is used for the residential buildings analysis. Climate zone-specific data for nonresidential buildings are unavailable; therefore, nonresidential adjustment factors relied on statewide averages.

The adjustment factors (specific to both building type and energy type) are applied to the projected fuel use that is estimated by scaling 2021 energy use by the appropriate scaling factor (population for residential buildings and employment for non-residential buildings). Title 24 adjustment factors are then applied to this projected energy use to estimate legislative-adjusted BAU energy consumption and associated GHG emissions of future development with legislative adjustments. The adjustment factors are shown in Table 7. They are presented in terms of the percent change in energy use for buildings compliant with the 2022 Title 24 standards compared to those built to meet the 2019 Title 24 standards. Positive values indicate an anticipated increase in energy use (e.g., increased electrical demands from additional appliances, electrification of natural gas appliances), while negative values indicate an anticipated decrease in energy use (e.g., more energy efficiency, shifting away from natural gas appliances). It is important to note that although average electricity use in new residential buildings is anticipated to rise (due to an

increase in electrical demand associated with electric appliances installed instead of natural gas appliances), emissions from new residential buildings are expected to be lower than they would be under 2019 Title 24 as a result of overall lower building emissions intensities (due to lower emissions factors associated with electricity compared to natural gas).

Table 7 Title 24 Building Energy Adjustment Factors for 2022 Standards Compared to 2019 Standards

Building Type	Electricity	Natural Gas
Residential Buildings	24%	-34%
Nonresidential Buildings	-10%	-11%

Source: Compiled by Ascent in 2023.

BUILDING ENERGY RESULTS

Based on the building energy legislative reductions for new buildings and the expected net growth in the city's housing and employment, Table 8 shows the legislative-adjusted BAU forecast results for residential buildings and Table 9 shows legislative-adjusted BAU forecast results for nonresidential buildings. Under the BAU scenario, the 2021 emission factors would remain unchanged through 2045.

Table 8 Residential Building Energy Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Energy Type	2021	2030	2035	2040	2045	2050
Electricity	150,260	155,905	44,220	24,732	0	0
Natural Gas	121,641	143,877	155,511	167,144	178,777	190,410
Total	**271,900**	**299,782**	**199,731**	**191,876**	**178,777**	**190,410**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

Table 9 Nonresidential Building Energy Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Energy Type	2021	2030	2035	2040	2045	2050
Electricity	101,296	115,651	33,784	19,327	0	0
Natural Gas	25,096	143,877	155,511	167,144	178,777	190,410
Backup Generators	73	111	131	151	171	191
Total	**126,465**	**259,640**	**189,426**	**186,622**	**178,948**	**190,602**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

ON-ROAD TRANSPORTATION

The emissions projections associated with the on-road transportation sector are calculated by multiplying the projected annual VMT and the vehicle emission factors by vehicle category. VMT projections were developed using data provided by Fehr & Peers and the origin-destination method, consistent with SB 375. For the BAU forecast, the applied future emission factors are based on 2021 emission factors. For the legislative-adjusted BAU forecast, the future vehicle emission factors are based on those from the CARB EMFAC2021 webtool which includes legislative adjustments from state and federal policies and regulations including the Pavley Clean Car Standards, Advanced Clean Car I (ACC I) regulation, and fuel efficiency standards for medium- and heavy-duty vehicles. It should be noted that the Low Carbon Fuel Standard was excluded in EMFAC2021 forecasts because the emissions benefits originate

from upstream fuel production and do not directly reduce vehicle tailpipe emissions that affect the city's GHG emissions forecasts. Additionally, the effects of the Advanced Clean Cars II (ACC II) regulation were incorporated in this forecast. For ACC II, sales of electric vehicles are adjusted upwards from the default EMFAC values to be consistent with the state's target where 100 percent of new passenger vehicle sales are plug-in hybrids or battery electric vehicles by 2035 (California Air Resources Board 2022). The total estimated VMT and corresponding legislative-adjusted BAU emissions from on-road transportation for each forecast year are given in Table 10 and Table 11 respectively.

Table 10 On-Road Transportation Community Total Estimated VMT

Source	2021	2030	2035	2040	2045	2050
On-Road Passenger Transportation	944,367,693	1,114,891,221	1,204,569,915	1,294,248,608	1,383,927,302	1,473,605,996
On-Road Commercial Transportation	192,332,970	247,871,587	276,632,912	305,394,236	334,155,561	362,916,885
Total	**1,136,700,663**	**1,362,762,808**	**1,481,202,826**	**1,599,642,844**	**1,718,082,863**	**1,836,522,881**

Notes: VMT= vehicle miles traveled.

Source: Compiled by Ascent in 2023.

Table 11 On-Road Transportation Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	2021	2030	2035	2040	2045	2050
On-Road Passenger Transportation	339,716	298,120	210,729	133,443	77,388	52,915
On-Road Commercial Transportation	246,504	150,998	127,648	103,798	89,452	87,910
Total	**586,220**	**449,118**	**338,377**	**237,241**	**166,840**	**140,825**

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2025.

OFF-ROAD VEHICLES AND EQUIPMENT

Emissions for different sources under the off-road vehicles and equipment sector were estimated by scaling 2021 inventory emissions by growth factors listed in Table 12. This approach was used instead of using CARB's 2021 OFFROAD model to account for the growth in various emission sources by the various scaling methods (for example, growth in employment, change in agricultural acres). No legislative reductions could be applied to this sector, so legislative-adjusted BAU emissions are equivalent to BAU emissions.

Table 12 Off-Road Vehicles and Equipment Forecast Methods by Source

Source	Scale Factor Forecast Method	Applied Legislative Reductions Forecast Method
Construction Equipment[1]	Service Population	OFFROAD2021 emissions factor considerations include EPA off-road compression-ignition engine standards implementation schedule.
Industrial Equipment	Employment	
Lawn and Garden Equipment	Population	
Light Commercial Equipment	Employment	
Portable Equipment	Employment	
Recreational Equipment	Population	
Transport Refrigeration Units	Service Population	

Notes: EPA = US Environmental Protection Agency; OFFROAD2021 = California Air Resources Board's OFFROAD2021 model.

[1] This is part of the "construction and mining" combined category in CARB's OFFROAD model. Mining does not occur within the city, therefore this subsector is used to represent the construction-related emissions in the city.

Source: Compiled by Ascent in 2023.

Table 13 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from the off-road vehicles and equipment sector for 2030, 2035, 2040, 2045, and 2050.

Table 13 Off-Road Vehicles and Equipment Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	2021	2030	2035	2040	2045	2050
Construction Equipment	9,033	12,023	13,583	15,142	16,701	18,261
Industrial Equipment	1,219	1,868	2,204	2,540	2,876	3,213
Lawn and Garden Equipment	2,817	3,602	4,012	4,423	4,833	5,243
Light Commercial Equipment	2,071	3,173	3,745	4,316	4,888	5,459
Portable Equipment	1,905	2,918	3,444	3,969	4,495	5,020
Recreational Equipment	229	293	326	360	393	426
Transport Refrigeration Units	1,066	1,419	1,603	1,787	1,971	2,155
Total	**18,341**	**25,296**	**28,917**	**32,537**	**36,158**	**39,778**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

SOLID WASTE

Solid waste sector emissions are associated primarily with the decomposition of mixed municipal solid waste generated in landfills by community activities, while a smaller proportion of emissions are produced by the decomposition of composted yard trimmings. No legislative reductions could be applied to this sector, so legislative-adjusted BAU emissions are equivalent to BAU emissions, which were scaled by service population growth within the city. Table 14 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from the solid waste sector for 2030, 2035, 2040, 2045, and 2050.

Table 14 Solid Waste Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	2021	2030	2035	2040	2045	2050
Community-Generated Solid Waste	18,508	23,754	26,835	29,916	32,997	36,078
Compost	1,714	2,281	2,577	2,872	3,168	3,464
Total	**20,222**	**26,034**	**29,411**	**32,788**	**36,165**	**39,542**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

WATER SUPPLY

Water supply emissions occur indirectly from the consumption of electricity associated with extracting, conveying, treating, and distributing imported water to the city. For water supplied from local sources (i.e., water supplied by the Elk Grove Water District and Sacramento County Water Agency), the electricity usage associated with extracting, conveying, treating, and distributing water is captured in the building energy sector because these activities take place within the city and SMUD provided electricity usage data that reflects electricity consumption for all end uses within the city. Energy consumption for future years is estimated by scaling 2021 energy consumption using population. The BAU forecast uses the GHG emissions factors used to calculate emissions in the 2021 inventory for all forecast years. Under the legislative-adjusted BAU forecast, the emissions factors align with RPS, consistent with the requirements of SB 1020 and SB 100 (see emission factor forecasts in Forecast Details by Emissions

Sector 1.1.3 for details). To calculate future emission factors, SMUD's 2021 electricity supply emissions factor was adjusted to reflect the additional carbon-free electricity mix percentage obtained to meet the minimum RPS standards. As a result, the emission factors are estimated by incorporating the associated carbon-free mix in SMUD's 2021 carbon-free electricity mix for each forecast year. The emission factors and carbon-free mix of electricity and associated GHG emissions factors for the legislative-adjusted BAU forecast are presented in Table 4. Emissions are calculated by multiplying the annual projected energy use by the respective emission factors. Table 15 presents projected fuel consumption and Table 16 presents 2021 inventory and legislative-adjusted BAU forecasted emissions from the water supply sector for 2030, 2035, 2040, 2045, and 2050.

Table 15 Water Supply Community Electricity Consumption in kWh

Source	2021	2030	2035	2040	2045	2050
EGWD	2,722,412	3,623,489	4,093,471	4,563,452	5,033,434	5,503,415
SCWA	8,797,498	11,709,337	13,228,086	14,746,835	16,265,584	17,784,333
Wells	8,786	11,694	13,211	14,728	16,244	17,761
Total	**11,528,696**	**15,344,520**	**17,334,768**	**19,325,015**	**21,315,262**	**23,305,509**

Notes: Totals may not sum exactly due to independent rounding. EGWD = Elk Grove Water District; kWh = kilowatt-hours; SCWA = Sacramento County Water Agency.

Source: Data modeled by Ascent in 2023.

Table 16 Water Supply Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	2021	2030	2035	2040	2045	2050
EGWD	662	679	192	107	0	0
SCWA	2,140	2,196	620	346	0	0
Wells	0	0	0	0	0	0
Total	**2,802**	**2,875**	**812**	**453**	**0**	**0**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

WASTEWATER TREATMENT

Emissions projections associated with the wastewater treatment sector account for emissions generated from several different sources during the treatment and collection of wastewater from centralized wastewater treatment plants (WWTPs) in the city. 2021 emissions are directly scaled to estimate emissions forecast in future years using service population growth within the city. No legislative reductions could be applied to this sector, so legislative-adjusted BAU emissions are equivalent to BAU emissions. Table 17 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from the wastewater treatment sector for 2030, 2035, 2040, 2045 and 2050.

Table 17 Wastewater Treatment Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	2021	2030	2035	2040	2045	2050
Centralized WWTP	2,791	6,485	7,326	8,167	9,009	9,850
Septic Systems	167	222	251	280	309	337
Total	**2,957**	**6,707**	**7,577**	**8,447**	**9,317**	**10,187**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; WWTP = wastewater treatment plant.

Source: Data modeled by Ascent in 2023.

AGRICULTURE

Emissions projections associated with the agriculture sector include emissions from livestock management, fertilizer application, use of off-road equipment on agricultural land, and electricity consumption in agricultural buildings. 2021 activity data for this sector is scaled using growth in agricultural land to estimate future emissions. Agricultural land use acres in the city are projected to decline from 2021 through 2035 and remain steady after 2035. This projected change in agricultural land acres was used to scale GHG emissions from livestock management, fertilizer application, and agricultural off-road vehicles and equipment. As a result, emissions from these sources are projected to decline through 2035 and remain steady through 2050. The projected decline in agricultural emissions is also associated with a decline in emissions from agricultural buildings as a result of the reduction in electricity emission factors through SB 100 and SB 1020 (see Emission Factor Forecasts in Forecast Details by Emissions Sector 1.1.3 for details). Table 18 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from agriculture for 2030, 2035, 2040, 2045, and 2050.

Table 18 Agriculture Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Source	Livestock Management BAU	Livestock Management Legislative-Adjusted BAU	Fertilizer Application BAU	Fertilizer Application Legislative-Adjusted BAU	Agricultural Equipment BAU	Agricultural Equipment Legislative-Adjusted BAU	Agricultural Building Energy BAU	Agricultural Building Energy Legislative-Adjusted BAU	Total BAU	Total Legislative-Adjusted BAU
2021	2,779	2,779	1,518	1,518	875	875	5,104	5,104	**10,275**	**10,275**
2030	1,195	1,195	653	653	329	329	2,195	1,692	**4,372**	**3,869**
2035	316	316	172	172	87	87	580	112	**1,154**	**686**
2040	316	316	172	172	87	87	580	56	**1,154**	**630**
2045	316	316	172	172	87	87	580	0	**1,154**	**575**
2050	316	316	172	172	87	87	580	0	**1,154**	**575**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

1.2 CITY OF ELK GROVE OPERATIONS GREENHOUSE GAS EMISSIONS FORECASTS

1.2.1 Business-as-Usual Forecast

Estimated COEG operations BAU emissions forecasts were based on predicted growth in COEG employment between 2021 and 2045. Change in employment was the sole factor used to forecast BAU emissions for 2030 and 2045 for all sectors in COEG operations inventory. COEG staff provided employment estimates for 2030 and 2045 forecasts were based on the city's overall employment growth between 2021 and 2045. Table 19 shows 2021 COEG employment and anticipated change in employment for the forecast years.

Table 19 City of Elk Grove Operations Demographic Forecasts

Forecast Factor	2021	2030	2045
City of Elk Grove Employment	424	561	727
Percent Growth from 2021	NA	32%	72%

Notes: NA = Not applicable.

Source: Data provided by City of Elk Grove; calculations by Ascent in 2023.

BAU projections in activity growth (e.g., electricity use, vehicle fuel use) are translated to emissions using emission factors from the 2021 inventory year. Under the BAU scenario, it is assumed that baseline emission factors remain unchanged in the future because without adopted legislation requiring reduced emissions from such sources as electricity generation and vehicles (e.g., SB 100), future emission factors would stay the same as they do currently. The resulting scaled activity growth factors are shown in Table 20.

Table 20 City of Elk Grove Operations BAU Activity Data Forecast by Emissions Sector

Emissions Sector	Source	Units	Activity levels in 2030	Activity levels in 2045
Buildings and Facilities	Electricity	MWh	4,435	5,751
	Natural Gas	therms	229,728	297,883
	Backup Generators (Diesel)	gallons	239	310
Streetlights and Traffic Signals	Streetlights Electricity	MWh	4,093	5,308
	Traffic Signals Electricity	MWh	763	989
Employee Commute	Employee Commute	VMT	3,069,503	3,980,157
Vehicle Fleet	Combustion Vehicles	VMT	1,864,742	2,417,969
	Electric Vehicles	VMT	1,932	2,505
Solid Waste	Landfill	tons	496	644
	Compost	tons	606	786
Water Supply	EGWD	MWh	1	2
	SCWA	MWh	48	62
Wastewater Treatment	NA	NA	NA	NA
Process & Fugitive Emissions	NA	therms	229,728	297,883

Note: BAU = Business-as-usual forecast; EGWD = Elk Grove Water District; MWh = megawatt-hours; NA = Not applicable; SCWA = Sacramento County Water Agency; VMT = vehicle miles traveled.

Source: Data modeled by Ascent in 2023.

1.2.2 Legislative-Adjusted Business-as-Usual Forecast

The legislative-adjusted BAU scenario accounts for the effect of adopted legislative and regulatory actions at the state and federal levels on local emissions without additional action by COEG. For building energy, streetlights and traffic signals, and water supply sectors, legislative reductions affect electricity emission factors through SB 100 and SB 1020 to account for increased carbon-free requirements for the electricity sector. For the employee commute sector and vehicle fleet sectors, legislative reductions affect emissions factors through ACC II and ACF. The wastewater treatment and solid waste sectors do not incorporate legislative reductions. Table 10 in the Forecast Memorandum presents a summary of the legislative adjustments applied to COEG operations activity data and emissions factors by sector under the legislative-adjusted BAU scenario. A detailed discussion of each sector is presented in section 1.2.3.

1.2.3 Forecast Detail by Emissions Sector

BUILDINGS AND FACILITIES ENERGY

Emissions associated with COEG-owned buildings and facilities are generated from the upstream generation of electricity and on-site combustion of natural gas and diesel (in backup generators). Emissions from future electricity, natural gas, and backup generator use in COEG buildings and facilities were estimated by multiplying anticipated energy use by forecasted emissions factors. Forecasted energy consumption for COEG buildings and facilities is estimated by scaling 2021 energy consumption using COEG employment. The BAU forecast uses the GHG emissions

factors used to calculate emissions in the 2021 inventory for all forecast years. The legislative-adjusted BAU forecast considers changes to the carbon intensity of electricity generation under SB 100 and SB 1020 that would affect future electricity emission factors. Emissions are calculated by multiplying the annual projected building energy use by the respective emission factors.

Emission Factor Forecasts

Electricity

Under BAU forecasts, SMUD's 2021 emissions factor is assumed to remain unchanged through 2045. Under the legislative-adjusted BAU forecast, the emissions factors align with RPS standards which are set through SB 1020 and SB 100 (see Emission Factor Forecasts in Forecast Details by Emissions Sector 1.1.3 for details). To calculate future emission factors, SMUD's 2021 electricity supply emissions factor was adjusted to reflect the additional carbon-free electricity mix percentage obtained to meet the minimum RPS standards. As a result, the emission factors are estimated by incorporating the associated carbon-free mix in SMUD's 2021 carbon-free electricity mix for each forecast year. The emission factors and carbon-free mix of electricity and associated GHG emissions factors for the legislative-adjusted BAU forecast are presented in Table 4.

Natural Gas

Emissions factors associated with natural gas combustion are based on emissions factors from TCR, as described in Section 1.1.3 under natural gas emission factors. These emissions factors are not anticipated to change over time, as there are no legislative actions that would reduce the carbon intensity of natural gas. The emission factors of natural gas for PG&E supplied natural gas are presented in Table 5.

Diesel

Emissions from diesel fuel used to power backup generators are based on emissions factors from TCR, as described in Section 1.1.3. Emissions factors associated with diesel combustion are not anticipated to change over time, as there are no legislative actions that would reduce the energy intensity of diesel. The emission factors of diesel fuel used to power backup generators are presented in Table 6. Table 21 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions for COEG buildings and facilities energy sector by energy type for 2030 and 2045.

Table 21 Buildings and Facilities Energy GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Energy Type	2021	2030	2045
Electricity	815	829	0
Natural Gas	924	1,222	1,585
Backup Generators	2	2	3
Total	**1,741**	**2,054**	**1,588**

Notes: Totals may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

STREETLIGHTS AND TRAFFIC SIGNALS

Emissions projections associated with the streetlights and traffic signals sector account for emissions generated from purchased electricity from SMUD to operate the streetlights and traffic signals. Forecasted electricity consumption is estimated by scaling 2021 electricity use using COEG's employment factor. The BAU forecast uses the GHG emissions factors used to calculate emissions in the 2021 inventory for all forecast years. Under the legislative-adjusted BAU forecast, the emissions factors align with RPS standards which are set through SB 1020 and SB 100 (see Emission Factor Forecasts in Forecast Details by Emissions Sector 1.1.3 for details). To calculate future emission factors, SMUD's 2021 electricity supply emissions factor was adjusted to reflect the additional carbon-free electricity mix percentage obtained to meet the minimum RPS standards. As a result, the emission factors are estimated by incorporating the

associated carbon-free mix in SMUD's 2021 carbon-free electricity mix for each forecast year. The emission factors and carbon-free mix of electricity and associated GHG emissions factors for the legislative-adjusted BAU forecast are presented in Table 4. Emissions are calculated by multiplying the annual projected electricity use by the respective emission factors. Table 22 presents 2021 inventory and legislative-adjusted BAU forecasted emissions for the streetlights and traffic signals sector for 2030 and 2045.

Table 22 Streetlights and Traffic Signals GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Streetlights and Traffic Signals	893	907	0

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

EMPLOYEE COMMUTE

The emissions projections associated with the employee commute sector are calculated by multiplying the projected annual VMT and the vehicle emission factors by vehicle category in 2030 and 2045. According to an employee commute survey that COEG conducted in 2022, 97 percent of employees drove to work alone. To be conservative, it was assumed that employees that commute to work all use passenger vehicles based on the 2022 employee commute survey conducted by COEG. Annual VMT for the sector is projected by scaling the 2021 annual COEG employee VMT using the number of COEG employees. For the BAU forecast, the applied future emission factors are based on 2021 emission factors. For the legislative-adjusted BAU forecast, the future vehicle emission factors are based on those from the CARB EMFAC2021 webtool and are adjusted to account for the effects of ACC II. For ACC II, sales of electric vehicles are adjusted upwards from the default EMFAC values to be consistent with the state's target where 100 percent of new passenger vehicle sales are plug-in hybrids or battery electric vehicles by 2035 (California Air Resources Board 2022). Table 23 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from COEG employee commutes for 2030 and 2045.

Table 23 Employee Commute GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Employee Commute	835	769	201

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

VEHICLE FLEET

Vehicle fleet VMT data for 2021 were provided by COEG for all COEG-owned vehicles by vehicle class. The BAU forecast uses the GHG emissions factors used to calculate emissions in the 2021 inventory for all forecast years. Under the legislative-adjusted BAU forecast, the total VMT was adjusted to incorporate the impacts of ACC II and ACF under which additional electric vehicles are expected to be added to COEG's vehicle fleet. This will spread the total VMT into VMT by conventional vehicles and VMT by electric vehicles. Under ACC II and ACF, vehicle emission factors will also decrease due to better fuel efficiency. Table 24 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from the vehicle fleet sector by fuel source for 2030 and 2045. As shown by the increase in fleet emissions from 2045 to 2050, the forecasted growth in COEG's fleet is expected to outpace the applied legislative reductions.

Table 24 Vehicle Fleet GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Vehicle Fleet	620	578	646

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled

Source: Data modeled by Ascent in 2025.

SOLID WASTE

Emissions projections associated with the solid waste sector include emissions from the landfill and compost. Waste tonnage projections are based on the growth in the number of employees in COEG. Emissions were calculated using the ClearPath[2] tool. No legislative reductions were applied to this sector. This is because SB 1383 (legislation applicable to the solid waste sector) requires COEG to take actions locally, hence these reductions will be applied as part of the Climate Compass's GHG reduction measures and not as part of the forecasts. Therefore, the legislative-adjusted BAU emissions forecast for the solid waste sector is equivalent to BAU emissions forecast. Table 25 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from the municipal operations solid waste sector for 2030 and 2045.

Table 25 Solid Waste GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Landfill Disposed Waste	107	142	184
Compost	32	42	55
Total	**139**	**184**	**239**

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by ClearPath in 2023.

WATER SUPPLY

For the water supply from local sources within the city, the electricity usage associated with extracting, conveying, treating, and distributing water is captured in the buildings and facilities energy sector because these activities take place within the city. Therefore, the electricity usage and emissions associated with extracting, conveying, treating, and distributing water from outside the city boundary were applied to the municipal water supply sector. Table 26 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from municipal operations water supply for 2030 and 2045.

Table 26 Water Supply GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Activity	2021	2030	2045
EGWD	0.27	0	0
SCWA	8.8	9	0
Total	**9.1**	**9**	**0**

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; EGWD = Elk Grove Water District; SCWA = Sacramento County Water Agency.

Source: Data modeled by Ascent in 2023.

WASTEWATER TREATMENT

Emissions projections associated with the wastewater treatment sector account for emissions generated from several different sources during the treatment and collection of wastewater. Although by 2050, electricity emissions factors are reduced to zero, increases in process and fugitive emissions resulting from wastewater collection and treatment would offset decreased electricity emissions. Table 27 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from wastewater treatment for 2030 and 2045.

[2] ClearPath is an online software platform for estimating emissions. ClearPath was used for this sector because it provides geographically specific results.

Table 27 Wastewater Treatment GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Wastewater Treatment	7	7	3

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by Ascent in 2023.

PROCESS AND FUGITIVE EMISSIONS

Emissions in this sector are generated from the natural gas that escapes into the atmosphere during different processes and pipeline leakages. Activity projections are based on the growth in the number of employees at COEG. Emissions were calculated using the ClearPath tool for consistency with previous COEG operations inventories. No legislative reductions were applied to this sector. Table 28 shows the 2021 inventory and legislative-adjusted BAU forecasted emissions from process and fugitive emissions sector for 2030 and 2045.

Table 28 Process and Fugitive Emissions GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts (Annual $MTCO_2e$)

Source	2021	2030	2045
Process and Fugitive Emissions	32	42	55

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Data modeled by ClearPath in 2023.

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Appendix C

Community Strategies and Actions

Memo

455 Capitol Mall, Suite 300
Sacramento, CA 95814
916.444.7301

Date: February 19, 2026

To: Christopher Jordan and Carrie Whitlock (City of Elk Grove)

From: Hannah Kornfeld, Luis Montes, John Steponick, Erik de Kok, and Honey Walters (Ascent)

Subject: City of Elk Grove Climate Compass: Final Community Strategies and Actions

1 INTRODUCTION

The City of Elk Grove (COEG) is preparing an update to its 2019 Climate Action Plan (CAP), hereinafter referred to as the "Climate Compass." The Climate Compass will incorporate recently adopted State legislation and further revise and serve as a qualified greenhouse gas (GHG) reduction plan used for programmatic tiering per California Environmental Quality Act (CEQA) Guidelines section 15183.5.

This memorandum provides a framework for developing GHG reduction and adaptation strategies that incorporate mechanisms for implementing, tracking, and funding such strategies within a CEQA-qualified GHG reduction plan. It provides recommendations for incorporating these requirements effectively to ensure they are successful.

This document discusses the following:

- CEQA Requirements
- Guidelines for Strategies
- Strategies and Actions
- Targets
- Gap Analysis

2 CEQA REQUIREMENTS

CEQA allows for the tiering, or streamlining, of GHG analyses for individual projects under a programmatic GHG reduction plan, or CAP, pursuant to CEQA Guidelines section 15183.5. CAPs used for this purpose must meet key requirements outlined under CEQA Guidelines section 15183.5(b), which serves to guide the development of a plan with clear and reasonable implementation steps, tracking mechanisms, and GHG reduction estimates supported by substantial evidence. CEQA Guidelines section 15183.5 subdivision (b)(1)(C) and (b)(1)(D) provide the specific requirements for measures included in a GHG reduction plan, stating that a plan should:

- identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area [Elk Grove], and
- specify measures or groups of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions [reduction] level.

While the above elements are not all the requirements for a GHG reduction plan under CEQA, they apply to developing individual GHG reduction strategies. CEQA Guidelines section 15183.5, subdivision (b)(1) does not expressly impose CEQA mitigation measure standards on GHG reduction strategies and actions included in a qualified GHG reduction plan. However, when used for project CEQA streamlining, reduction strategies included in a GHG reduction plan must meet the above requirements from section 15183.5 subdivision (b)(1). They must also be binding and enforceable on projects for which the measures apply, per CEQA Guidelines section 15183.5 subdivision (b)(2). If the strategies are not binding and enforceable for the project to which they apply, the strategies must be included as mitigation measures for the project and therefore must at that time meet CEQA mitigation standards.

3 GUIDELINES FOR STRATEGIES

To meet the requirements of CEQA Guidelines section 15183.5, the GHG reduction strategies in the Climate Compass should follow guidelines, proposed here, that provide clear and specific implementation components for each of the strategies. This will allow COEG to provide substantial evidence that GHG reduction strategies will be implemented, monitored, and enforced (where applicable), with clear pathways and metrics for helping COEG staff achieve determined GHG reduction levels within the timeline of established targets. Each strategy should be compared against the following categories for conformity with CEQA.

- Mechanism for Implementation
- Public Engagement and Community Partnerships
- Performance Standard and Tracking Mechanisms
- Timeline of Implementation
- Funding Mechanism

3.1 MECHANISM FOR IMPLEMENTATION

Each GHG reduction strategy in the Climate Compass should clearly outline the implementation approach, indicating whether a new program needs creation, or an existing one requires modification, and if subsequent ordinance or regulation development is necessary for enforcement. While not all measures will be enforceable through an ordinance, the Climate Compass should detail COEG's intentions, approach, capacity, and timing for partnering with external entities if needed.

Guideline recommendations include:

- Does the strategy create or call for a program or ordinance that can be implemented by COEG?
- If COEG is not solely responsible for implementation, are program criteria and COEG's role in relationship to the role(s) of others sufficiently defined?
- Is a department or agency identified to lead implementation?
- Are resources currently available for implementation, or does additional funding/staff time need to be allocated?
- Is the mechanism for implementation binding and enforceable for projects using the Climate Compass for CEQA streamlining?

3.2 PUBLIC ENGAGEMENT AND COMMUNITY PARTNERSHIPS

Effective GHG reduction strategy implementation necessitates community awareness of available programs and required ordinances. Strategies should incorporate actions for community engagement and partnerships with agencies and community-based organizations (CBOs) to disseminate information. Collaborations with CBOs can facilitate implementation efforts and reduce the need for hiring additional staff. Guideline recommendations include:

- Does the strategy specify a mechanism for informing and engaging the public to support implementation?
- Can partnerships with existing CBOs or governmental agencies be leveraged to expand available resources for implementation? Would any specific agreements or related actions be required following Climate Compass adoption to establish partnerships?

3.3 PERFORMANCE STANDARD AND TRACKING MECHANISM

Each strategy should include a performance standard(s) to gauge program success or long-term emissions reduction, supported by substantial evidence. These standards must be clearly defined within the strategy language, aligning with the Climate Compass's GHG reduction target years. They should be designed for easy tracking, utilizing existing processes, or including necessary actions to develop tracking mechanisms. Guideline recommendations include:

- Is a key performance indicator (KPI) or performance standard (e.g., square feet of floor space electrified) included in the text of the strategy?
- Is a target year(s) established for each KPI or performance standard that aligns with GHG reduction target years?
- Is a tracking mechanism for data collection related to the KPI or performance standard indicated within the strategy's implementing actions, or is the creation of a tracking mechanism included if one does not exist?

3.4 TIMELINE OF IMPLEMENTATION

Each strategy should outline a clear timeline for implementation to support achieving GHG reductions within the Climate Compass's target timeframe. This timeline may include adoption or effective dates for ordinances, establishment of programs, or execution of outreach campaigns. For longer-term strategies requiring further evaluation, study, or funding, estimated milestone dates should be included for completing implementing actions or phases, enhancing transparency, and aiding COEG in prioritizing initiatives and funding applications. Guideline recommendations include:

- Does each implementation action for each Climate Compass strategy include a timeline for implementation, and if the action is dependent on the implementation of other actions (such as the completion of a feasibility study), is this identified?

3.5 FUNDING MECHANISM

Funding is crucial for the success of GHG reduction measures. Therefore, each strategy should include an action to explore funding mechanisms or identify potential grant sources or financing options. While not all strategies may have readily available funds, outlining potential sources demonstrates a proactive approach to implementation. A funding roadmap will be developed to explore funding sources and financing mechanisms, supplementing local city funds for immediate actions. Guideline recommendations include:

- Does the strategy identify an actual or potential funding mechanism/source to initiate or sustain the implementation?

4 STRATEGIES AND ACTIONS

The strategies, actions, key performance indicators (KPIs), implementing departments, and partnerships for implementation under several categories:

- Buildings and Energy
- Transportation
- Resilience and Adaptation
- Resource Consumption
- Green Economy
- Climate Action Commitment

KPIs are identified that align with the anticipated GHG reduction for each strategy. Strategies include implementation actions that identify more specific programs, policies, and partnerships to achieve the objectives of the strategies.

Actions also include COEG departments that would be responsible for implementing each action and, where applicable, partnerships with agencies and organizations have been identified. In the table that follows, COEG departments have been abbreviated as such:

CD	Community Development
CM	City Manager's Office
FI	Finance
PD	Police
PW	Public Works

Agency partners and organizations have been abbreviated as such:

BERC	Business Environmental Resource Center
BIA	North State Building Industry Association
CCSD FD	Cosumnes Community Services District Fire Department
CCSD PR	Cosumnes Community Services District Parks and Recreation Department
EGCG	Elk Grove Community Garden and Learning Center
EGUSD	Elk Grove Unified School District
EGWD	Elk Grove Water District
FLC	Food Literacy Center
GO-Biz	California Governor's Office of Business and Economic Development
GSEC	Greater Sacramento Economic Council
LCWC	Laguna Creek Watershed Council
LRCCD	Los Rios Community College District
Republic	Republic Services
SACDOT	Sacramento County Department of Transportation
SacOES	Sacramento County Office of Emergency Services

SACOG	Sacramento Area Council of Governments
SacRT	Sacramento Regional Transit District
SBCTC	Sacramento-Sierra Building and Construction Trades Council
SCAC	Sacramento County Agricultural Commissioner
SCPH	Sacramento County Public Health
SCWA	Sacramento County Water Agency
SCWMR	Sacramento County Waste Management and Recycling
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SPL	Sacramento Public Library
SRBX	Sacramento Regional Builders' Exchange
STF	Sacramento Tree Foundation
TeamCA	Team California

4.1 CO-BENEFITS

In addition to reducing GHG emissions and improving resilience to climate impacts, the strategies and actions in the Climate Compass include numerous co-benefits. Below are preliminary co-benefits and associated definitions to be considered for inclusion in the Climate Compass:

- Equity: Ensures fair distribution of benefits and burdens across all communities, focusing on supporting underserved and vulnerable populations.
- Air Pollution Prevention: Decreases harmful air pollutants, improving air quality and public health outcomes.
- Health and Wellbeing: Contributes to improved physical and mental health and overall quality of life for residents and visitors.
- Infrastructure Reliability: Enhances the reliability and durability of critical assets and infrastructure in the face of climate change impacts.
- Community Resilience: Strengthens Elk Grove's ability to withstand and recover from climate-related shocks and stresses, fostering a sense of empowerment and unity in the community.
- Resource Preservation: Protects and preserves valuable natural resources, reducing Elk Grove's environmental footprint.
- Economic Diversity: Embraces innovative technologies, supports the local workforce, and promotes effective business practices that create new economic opportunities and contribute to a more diverse local economy.

Category, Strategy, Action(s)	Implementing Dept(s)	Community Partner(s)	Timing
Buildings and Energy (BE)			
Strategy BE-1: Electrify and Decarbonize Buildings **Key Indicators:** ▸ Number of existing residential units fully electrified ▸ Number of new residential units fully electrified ▸ Number of existing nonresidential buildings fully electrified ▸ Number of new nonresidential buildings fully electrified			
Action BE-1.1a: Adopt by ordinance a new building reach code (based on cost-effectiveness studies, stakeholder outreach, and California Energy Commission approval) setting energy efficiency standards that must be met by all nonresidential new construction and major renovations.	CD, CM	BIA, SBCTC, SRBX	Near Term
Action BE-1.1b: Promote and encourage voluntary actions for the construction of new residential buildings that provide greater energy efficiency and reduced GHG emissions than otherwise required by the building codes.	CD, CM	BIA, SBCTC, SBRX	Near Term
Action BE-1.2: Develop a comprehensive building energy retrofit plan to transition existing residential and nonresidential buildings to all-electric.	CD	SMUD	Near Term
Action BE-1.3: Explore partnerships with regional organizations or grant opportunities to develop a funding mechanism (e.g., revolving loan fund, grant program) to support low-income households with covering the cost of time-of-replacement/emergency replacement of water heaters and/or HVAC units with electric options, as well as any necessary electrical upgrades.	CM, CD, FI	SMUD	Near Term
Action BE-1.4: Partner with SMUD to explore offering on-bill financing or pay-as-you-save programs specifically for building electrification projects.	CM	SMUD	Near Term
Action BE-1.5: Adopt by ordinance a standard that is compliant with State and Federal law for the conversion of HVAC to heat pump systems for existing nonresidential buildings.	CD	SMUD	Near Term
Strategy BE-2: Increase Density and Expand Affordable Housing **Key Indicators:** ▸ Number of residents per square mile ▸ Number of affordable housing units constructed			
Action BE-2.1: Prepare and adopt land use plan and zoning revisions that increase the allowed density and intensity of development along the city's major transit corridors.	CD	N/A	Near Term
Strategy BE-3: Increase Local Renewable Energy Use and Storage **Key Indicators:** ▸ Amount (kW) of rooftop renewable energy installed ▸ Percent of electric grid that is carbon-free ▸ Amount (MW) of battery capacity installed			
Action BE-3.1: Support and coordinate with SMUD in executing its *2030 Zero Carbon Plan*.	CM, CD, PW	SMUD	Ongoing
Action BE-3.2: Partner with SMUD to expand and strengthen existing participation incentives for their *Virtual Power Plant Pilot Program*, where customers' private solar and battery storage systems can be aggregated and utilized as a renewable, resilient, and reliable backup power supply during emergencies or peak demand periods.	CM, CD	SMUD	Midterm
Strategy BE-4: Reduce Energy Consumption and Energy Burden **Key Indicators:** ▸ Amount (MWh) of electricity used jurisdiction-wide ▸ Amount (therms) of natural gas used jurisdiction-wide ▸ Number of households paying more than 5% of their income to energy bills			
Action BE-4.1: Establish a program that connects owners and occupants of residential and nonresidential buildings to existing energy audit and weatherization programs (e.g., California's *Low-Income Weatherization Program*) and resources, and additionally, helps to determine eligibility.	CM	SMUD	Near Term
Action BE-4.2: Partner with SMUD to promote and expand upon their *Home Performance Program*, which bundles various residential energy efficiency upgrades (e.g., heating and cooling systems, heat pump water heaters, air sealing, and insulation) to deliver more savings, comfort, and rebate options.	CM	SMUD	Midterm
Action BE-4.3: Coordinate with SMUD to promote their Energy Assistance Program Rate for low-income residential customers, which provides a monthly discount on a qualified customer's energy bill, to ensure all eligible residents are enrolled at this rate.	CD, CM	SMUD	Near Term

Category, Strategy, Action(s)	Implementing Dept(s)	Community Partner(s)	Timing
Transportation (TR)			
Strategy TR-1: Decrease Vehicle Miles Traveled **Key Indicators:** ▶ VMT per capita ▶ Number of new residential units along transit corridors ▶ Miles of new bikeways installed ▶ Miles of new sidewalks installed ▶ Percent of low stress on-street bikeways ▶ Number of e-bike incentives issued ▶ Number of bike and pedestrian ingress/egress points from subdivisions ▶ Number of new residential units or commercial square footage constructed within current city boundaries			
Action TR-1.1: Implement the infrastructure, programmatic, and policy recommendations included in the Bicycle, Pedestrian, and Trails Master Plan.	CM, CD, PW	EGUSD	Ongoing
Action TR-1.2: Coordinate with SacRT to improve the city's public transit system by increasing reliability and accessibility as well as by adding amenities such as seating, lighting, tree cover, and real-time arrival information displays. Extend service hours and routes to better serve residential areas, employment centers, and popular destinations, with a focus on "Transportation-Based Priority Populations" as identified by Caltrans' Transportation Equity Index.	CM, PW	SacRT	Ongoing
Action TR-1.3: Develop a local Transportation Management Agency, which works with residences and businesses to provide education on transit and alternative transportation services and programs, and provides other supportive programs that work to reduce VMT and increase transit use.	CM, CD	N/A	Near Term
Action TR-1.4: Expand an electric bike (e-bike) incentive program to encourage residents to purchase and use e-bikes for commuting and local trips instead of driving. Incentives will be provided as subsidies or discounts on e-bike purchases.	CM	N/A	Near Term
Action TR-1.5: Partner with Elk Grove Unified School District (EGUSD) to establish and better monitor Safe Routes to School programs aimed at promoting safe walking, biking, and other active transportation modes for students and families.	CM, PW	EGUSD	Ongoing
Action TR-1.6: Work with existing multi-unit building owners and require new multi-unit developments to install e-bike charging and secure bicycle parking in multifamily residential developments.	CM, CD	Multifamily building owners	Midterm
Action TR-1.7: Develop public awareness campaigns promoting the benefits of active transportation, public transit, and ridesharing.	CM	SacRT	Near Term
Action TR-1.8: Identify opportunities to create new ingress and egress pathways for bicycles and pedestrians within existing residential subdivisions. Require new developments to double the number of pathways compared to current standards.	CD, CM	TBD	Long Term
Strategy TR-2: Increase Zero-Emission Vehicle (ZEV) Adoption **Key Indicators:** ▶ Number of privately owned cars and light-duty vehicles registered that qualify as BEV/PHEV/FCEV ▶ Percent of privately owned cars and light-duty vehicles registered that qualify as BEV/PHEV/FCEV ▶ Number of charging stations ¼ miles from affordable housing			
Action TR-2.1: Adopt an ordinance requiring higher EV charging infrastructure for new commercial development.	CD	SMUD	Near Term
Action TR-2.2: Conduct a citywide study to identify optimal locations for public and multifamily residential EV charging stations based on traffic patterns, proximity to major destinations, equity, and existing electrical infrastructure.	CD, CM	SACOG, SMUD	Near Term
Action TR-2.3: Formalize a partnership with SMUD to collaborate on EV infrastructure planning, defining shared goals, responsibilities, and a framework for coordinating EV infrastructure planning, rate structures, incentive programs, and educational initiatives.	CM, CD	SMUD	Near Term
Action TR-2.4: Require new publicly accessible (non-card-lock) fueling stations to include one DC fast charger (DCFC) for each two fuel dispenser positions, with a minimum of one half of the required DCFC chargers to be installed and the remainder of the spaces to be EV Capable. This requirement may also satisfy the EV requirements for any on-site convenience store.	CD, CM	N/A	Near Term
Action TR-2.5: Partner with SMUD to promote ZEVs and provide information on available incentives.	CM	SMUD	Ongoing
Strategy TR-3: Reduce Off-Road Transportation Emissions			
Action TR-3.1: Require all construction projects starting in 2026 and later to use renewable diesel in diesel-powered construction equipment.	CD	SMAQMD	Near Term
Action TR-3.2: Prohibit the use of fossil-fuel-powered generators at construction sites in all discretionary projects.	CD	SMAQMD	Midterm

Category, Strategy, Action(s)	Implementing Dept(s)	Community Partner(s)	Timing
Action TR-3.3: Provide vouchers to business owners (e.g., landscaping businesses) to convert or replace their gasoline-powered gardening equipment, such as lawnmowers, leaf blowers, and hedge trimmers, with electric or other zero-emission alternative equipment. Work with waste collectors and SMAQMD to ensure proper disposal and/or reuse of gasoline-powered landscaping equipment.	CM	SMAQMD	Long Term
Resilience and Adaptation (RA)			
Strategy RA-1: Improve Climate and Emergency Preparedness			
Action RA-1.1: Adopt an ordinance for post-disaster recovery and reconstruction that includes provisions for debris clearance, damage assessment, demolitions, re-occupancy and building moratorium criteria, fee waivers and deferrals, for repair and reconstruction.	CD, PW	N/A	Midterm
Action RA-1.2: Utilize the "Sacramento Ready" website as a local climate resilience toolkit, partnering with SacOES, local businesses, and CBOs to distribute informational materials (pertaining to climate and emergency preparedness) to residents, which would be available in multiple languages and include specific considerations for those who may be more vulnerable (e.g., children, individuals with access and functional needs), along with keeping one's home or business safe.	PD	SacOES	Midterm
Strategy RA-2: Build Capacity for Current and Future Flooding			
Action RA-2.1: Coordinate with CCSD to identify potential locations for future large-scale, low-maintenance rain or pollinator gardens within the city (emulating the Elk Grove Rain Garden Plaza across from Colton Park), which can provide a range of benefits, such as reduced flooding, improved water quality, improved aesthetics, and being utilized as wildlife habitat.	CD, PW, CM, FI	CCSD PR	Near Term
Action RA-2.2: Continue to implement and work with developers to update as needed, the Storm Drainage Master Plan (SDMP) and ensure that candidate watershed projects and future development proposals associated with COEG's storm drainage and flood control collection system are consistent with the City objectives.	PW	N/A	Ongoing
Strategy RA-3: Protect Populations from Wildfire Smoke			
Action RA-3.1: Coordinate with the Sacramento Metropolitan Air Quality Management District (SMAQMD), and other local and regional agencies and organizations to develop a strategy for the widespread awareness and adoption of mobile applications (e.g., Smoke Spotter, AirNow), which can help populations prepare for wildfire smoke events.	PD, CM	SMAQMD	Near Term
Action RA-3.2: In partnership with Sacramento County Public Health and SMAQMD, develop a policy with established criteria and procedures to distribute N95 masks during or in anticipation of wildfire smoke events or prolonged periods of poor air quality.	PD	SCPH, SMAQMD	Near Term
Strategy RA-4: Reduce Exposure to Extreme Heat and Mitigate the Urban Heat Island Effect **Key Indicators:** ▸ Number of people served by severe weather shelters			
Action RA-4.1: Evaluate and consider establishing requirements for the use of heat mitigation measures in the public realm, particularly in common community gathering spaces (e.g., playgrounds, parks). Requirements may include the incorporation of: (1) building design features (e.g., varied building heights; setbacks from sidewalks; vertical and horizontal shade features); (2) cooling materials, treatments, and coatings (e.g., for rooftops); (3) multiple layers of shading to maximize coverage throughout the day; and (4) street trees and landscaping.	CD, CM, PW	CCSD PR	Midterm
Action RA-4.2: Develop and implement a cool pavement "roadmap" to expand the use of cool pavement across the city. The roadmap will identify pilot locations, potential funding sources, and performance-tracking mechanisms.	CD, CM, PW	SACDOT, SacRT	Near Term
Action RA-4.3: Establish a program to assist and incentivize residential and nonresidential building owners in retrofitting existing buildings with cool roofs or green roofs, underscoring the array of co-benefits they have to offer aside from mitigating the urban heat island effect, such as reduced energy costs. As part of the program, consider developing guidelines and linking to an array of external resources for proper maintenance and responsible disposal.	CM, CD	N/A	Midterm
Action RA-4.4: Partner with SacRT to study the feasibility of designing and installing bus shelters that offer protection and relief from heat, considering an array of measures and features.	CD, CM, PW	SacRT	Near Term
Action RA-4.5: Seek funding to further implement heat-mitigating public amenities, such as drinking fountains, water mister/spray areas, and shade structures in parks and other community gathering areas throughout the city, in collaboration with CCSD, EGUSD, and other appropriate partners.	CM	CCSD PR, EGUSD	Ongoing
Strategy RA-5: Expand the Urban Tree Canopy **Key Indicators:** ▸ Number of trees planted annually ▸ Percent urban canopy coverage			
Action RA-5.1: Adopt an ordinance to require new development to plant an appropriate number of trees on site to provide a 50 percent canopy cover over parking surfaces and a 20 percent canopy cover over the remainder of the site. Exemptions to the ordinance may be provided in cases where tree canopy may conflict with solar photovoltaic system siting on the development site, LID features, when conflicting with the Solar Shade Control Act, or on a case-by-case basis for industrial locations.	CD, PW	N/A	Midterm
Action RA-5.2: Develop and adopt a Urban Forest Master Plan to sustainably manage and increase tree canopy across the city, which includes or identifies: (1) potential new tree planting sites with a priority emphasis on areas with low canopy coverage (i.e., under 15 percent); (2) native tree species and design guidelines; and (3) best practices in watering and maintenance practices, along with street and park tree preservation.	PW, CM	STF	Ongoing

Category, Strategy, Action(s)	Implementing Dept(s)	Community Partner(s)	Timing
Action RA-5.3: In coordination with the Sacramento Tree Foundation (STF), develop and annually update a work plan to identify and budget for specific tree planting and maintenance projects for implementation each year consistent with the goals and targets of the Citywide Urban Forest Master Plan.	PW	STF, CCSD PR	Near Term
Action RA-5.4: Consider updates to the Tree Preservation and Protection Regulations to improve effectiveness and ensure enhancement of tree canopy.	CD, PW, CM	STF, CCSD PR	Near Term
Action RA-5.5: Continue to partner with STF to strengthen the city's public and private tree canopy through the increased usage and/or expansion of existing programs, such as "Sacramento Shade," which currently offers a free landscape assessment and up to 10 free shade trees for SMUD customers (e.g., homeowners, renters, and businesses), among other programs.	PW	STF, SMUD	Ongoing
Strategy RA-6: Expand Nature-Based Solutions			
Action RA-6.1: Encourage EGUSD to identify opportunities for schoolyard and campus greening projects. Enhance integration of schoolyard greening efforts with environmental education curricula to foster environmental awareness and engagement among students.	CM, PW	LCWC, CCSD PR	Midterm
Action RA-6.2: Investigate opportunities to establish new parks, greenways, and trail networks to connect existing green spaces and ensure all residents have access to nature.	CD, CM, PW	CCSD PR	Near Term
Action RA-6.3: Explore incentivizing climate smart land management in the rural area of the city.	CD	N/A	Midterm
Action RA-6.4: Evaluate rural lands for current and historical carbon storage (including mapping and modeling), the potential for future carbon sequestration with restoration, avoided conversion, or management, and the stability of the stored carbon and risk of carbon loss due to climate change or land use change.	CD, CM	SCAC, Resource Conservation Districts	Near Term
Resource Consumption			
Strategy RC-1: Increase Organic Waste Diversion ▶ Tons of organic waste diverted from landfill ▶ Percent of diverted residential organic waste by type ▶ Percent of residential units with organic waste collected regularly ▶ Tons of edible food recovered			
Action RC-1.1: Expand the City's existing organic recycling program for multifamily complexes, schools, and commercial businesses, by increasing access to centralized organic waste dumpsters and providing resources for implementing and/or improving source separation of food waste.	PW, CM	SCWMR	Ongoing
Action RC-1.2: Develop an edible food recovery program that encourages food generators (e.g., grocery stores, restaurants, and food service distributors) to execute private agreements with qualified food recovery organizations.	PW, CM	Republic	Midterm
Action RC-1.3: Encourage residents and businesses to actively participate in the City's food waste recycling program through increased education and outreach.	PW, CM	Republic	Ongoing
Strategy RC-2: Promote a Circular Economy **Key Indicators:** ▶ Percent of construction and demolition waste recycled ▶ Tons of waste sent to landfill annually (per capita)			
Action RC-2.1: Use the Sacramento County waste characterization study to provide information on actionable recommendations for waste reduction and diversion of residents and businesses in Elk Grove.	PW, CM	SCWMR	Ongoing
Action RC-2.2: Advance opportunities for reusing, repurposing, and sharing durable goods through partnering with the Sacramento Public Library to expand the Library of Things Program, providing information to residents and businesses related to relevant online platforms (e.g., Buy Nothing, TooGoodToGo, Olio, Vinted, etc.) and increasing public awareness of the Reuse Room at the SWCC.	PW, CM	SPL, SCWMR	Near Term
Action RC-2.3: Continue to incentivize residents to reduce the amount of waste they generate and send to landfills through waste collection fee adjustments that increase fees for solid waste containers and decrease fees for recycling, green, and organic waste containers.	PW	Republic	Ongoing
Action RC-2.4: Perform a Circular Economy Baseline Assessment of the City's existing waste streams, resource flows, and economic activities to identify opportunities for infrastructure, projects, and materials to be maintained as long as possible and identify areas with the highest potential for circularity.	PW, CM	Republic	Near Term
Strategy RC-3: Reduce Water Use **Key Indicators:** ▶ Percent of outdoor water use from recycled water ▶ Number of gallons of water used per person per day			
Action RC-3.1: Expand the use of recycled water in Elk Grove.	PW	EGWD, SCWA	Midterm
Action RC-3.2: Continue collaborating with Elk Grove Water District, Sacramento County Water Agency, and other water providers to participate in regional water-saving initiatives, encourage voluntary water conservation measures, and share best practices for water conservation strategies.	PW	EGWD, SCWA	Ongoing
Action RC-3.3: Mandate water efficiency standards for new construction that require water-neutral development for projects expected to exceed the historical water use of a parcel.	CD, PW	BIA, EGWD, SCWA	Midterm

Category, Strategy, Action(s)	Implementing Dept(s)	Community Partner(s)	Timing
Action RC-3.4: Regularly review and update the Water Efficient Landscape Ordinance to comply with evolving state laws.	CD	N/A	Ongoing
Green Economy			
Strategy GE-1: Support Green Businesses			
Action GE-1.1: Prioritize the retention, expansion, and attraction of green industry businesses and businesses.	PW	GSEC, TeamCA, GO-Biz	Near Term
Action GE-1.2: Create programs, policies, and incentives that increase retention, expansion, and attraction of green industry and sustainable businesses.	CM	N/A	Near Term
Action GE-1.3: Connect businesses with organizations that recognize sustainability efforts and provide resources like environmental updates, incentives, and educational tools.	CM	BERC	Near Term
Action GE-1.4: Support green industry and sustainable businesses in meeting their hiring needs while prioritizing the training and employment of Elk Grove residents in green jobs.	CM	GSEC, EGUSD, LRCCD	Midterm
Climate Action Commitment			
Strategy CA-1: Conduct Meaningful Community Outreach			
Action CA-1.1: Implement the Climate Ambassador Program as a permanent program, which recruits and trains volunteers to serve as local sustainability champions and educators.	CM	N/A	Near Term
Action CA-1.2: Develop a neighborhood resilience committee program to increase connectedness among the community and provide support during climate hazard events.	CM	N/A	Midterm
Action CA-1.3: Partner with SMUD to establish a comprehensive community outreach and education campaign to raise awareness about the benefits of building electrification, available incentives and programs, and the importance of decarbonizing the building sector.	CM	SMUD	Ongoing
Action CA-1.4: Partner with SMUD to promote its Residential, Neighborhood, and Commercial SolarShares programs, which allow residential customers, commercial customers, and developers to purchase renewably sourced electricity without having a solar system onsite.	CM	SMUD	Ongoing
Action CA-1.5: Work with regional partner agencies and utilities, such as SMAQMD and SMUD, to promote rebates and incentives for installing both residential and nonresidential renewable energy (e.g., solar) and battery storage systems.	CM	SMAQMD, SMUD	Ongoing
Strategy CA-2: Provide Community Education on Public Health and Wellbeing			
Action CA-2.1: Develop an educational campaign to raise awareness about the benefits of electric landscaping equipment.	CM	SMAQMD	Near Term
Action CA-2.2: Develop informational materials to provide information to residents and businesses to support the city's tree canopy.	CM, CD, PW	STF, SACOG	Near Term
Action CA-2.3: Partner with CBOs, such as the Elk Grove Community Garden and Learning Center and the Food Literacy Center, to expand gardening and healthy food education opportunities for individuals and families.	CM	EGUSD, EGCG, FLC	Midterm
Action CA-2.4: Promote circular economy awareness through educational campaigns and programs to educate residents and businesses about circular principles and encourage them to adopt circular practices and behaviors.	PW, CM, FI	SCWMR	Near Term
Action CA-2.5: Promote California's Clean Off-Road Equipment Voucher Program for professional landscape services, which provides vouchers to purchase zero-emission landscaping equipment.	CM	SMAQMD	Near Term
Strategy CA-3: Provide Community Education on Water Efficiency			
Action CA-3.1: Promote the use of smart water management technologies (e.g., smart irrigation controllers, leak detection devices, and real-time water monitoring systems) that provide real-time data on water usage and encourage water conservation.	CM	EGWD, SCWA	Near Term
Action CA-3.2: Continue conducting public education and outreach to raise awareness about the significance of water conservation, offer practical tips for reducing water consumption, and emphasize the opportunities accessible to residents for decreasing water usage.	CM	EGWD, SCWA	Ongoing
Strategy CA-4: Measure and Manage Climate Action Progress			
Action CA-4.1: Prepare and publish an annual report summarizing the City's progress towards its GHG reduction and adaptation goals, using the KPIs and other relevant metrics. Include narratives highlighting key accomplishments, challenges, lessons learned, and case studies of successful projects and initiatives. Present the report to the City Council to inform future climate action and adaptation-related budget and policy decisions.	CM, FI	N/A	Ongoing
Action CA-4.2: Regularly update data on progress towards the City's climate action and adaptation goals, including KPIs, in a clear and transparent manner for community members.	CM	N/A	Ongoing
Action CA-4.3: Conduct regular surveys, focus groups, and assessments to collect participant feedback and gauge shifts in knowledge, attitudes, and behaviors about sustainability.	CM	Climate Ambassadors	Near Term
Action CA-4.4: Establish a dedicated Climate Action Coordinator position within the City to lead climate, resilience, and sustainability initiatives across the City that include (1) supporting implementation of the Climate Compass, (2) collaborating across departments and stakeholders on opportunities to achieve the climate, resilience, and sustainability goals, (3) building partnerships with businesses, community organizations, educational institutions, and residents, and (4) pursuing funding and resource opportunities.	CM, FI	N/A	Near Term

5 TARGETS

5.1 STATEWIDE GREENHOUSE GAS REDUCTION TARGETS AND GOALS

As directed in Senate Bill (SB) 32 and Assembly Bill (AB) 1279, the State aims to reduce annual GHG emissions to:

- 40 percent below 1990 levels by 2030;
- 85 percent of anthropogenic emissions below 1990 levels by 2045; and
- Net zero emissions by 2045.

Elk Grove aims to reduce community emissions in proportion to the State's targets. Community emissions levels from 1990 are not available, which is the case for most local jurisdictions in California. Thus, community GHG reduction targets for the Climate Compass were developed relative to the 2021 community emissions inventory, consistent with guidance provided by the California Air Resources Board (CARB). Community GHG emissions in 2021 were 1,039,056 $MTCO_2e$. The methodology used to calculate Elk Grove's emissions reduction targets is described below.

5.2 CALIFORNIA'S CLIMATE CHANGE SCOPING PLANS AND 2021 GHG INVENTORY

The *2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan) reports statewide GHG emissions for eight sectors: agriculture, residential and commercial, electric power, high global warming potential (GWP) gases, industrial, recycling and waste, transportation, and cap-and-trade (CARB 2022a). CARB's California GHG Emission Inventory for 2021 also reports statewide GHG emissions for these eight sectors (CARB 2023). The 2022 Scoping Plan includes the range of reductions needed for each sector by 2045 to for the State to achieve the AB 1279 target of reducing statewide emissions to 85 percent below 1990 levels. CARB also estimates the GHG emissions removed through carbon dioxide removal technologies and natural and working lands net sinks to achieve net zero emissions by 2045, pursuant to AB 1279.

Chapter 5, "Challenge Accepted," of the 2022 Scoping Plan provides the following guidance to local agencies seeking to adopt GHG reduction targets in climate action planning efforts: although net zero targets can often be valuable and achievable, and mitigation is important, targets need to be considered in the larger context of these goals. This all means any GHG targets on a local scale should take into consideration the actions and outcomes included in the 2022 Scoping Plan. Jurisdictions considering "net zero" targets should carefully consider the implications such targets may have on emissions in neighboring communities and the ability of the state to meet our collective targets" (CARB 2022a: 269). However, not all emissions sector reductions can be achieved at the local level because local agencies often do not have jurisdiction over the emissions sectors included in the statewide inventory used to develop the statewide targets.

The statewide targets account for all emissions sectors in the State's GHG emissions inventory, statewide population forecasts for 2030 and 2045, and all statewide reductions necessary to achieve the statewide targets under SB 32 and AB 1279 in all sectors. The targets reported in the 2022 Scoping Plan are framed as targets that must be met on a statewide basis; however, this does not mean that the statewide sector targets must be applied uniformly to every local jurisdiction.

5.3 ELK GROVE'S GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

Based on a review of the 2022 Scoping Plan and an understanding of activities occurring within the city, COEG has direct or indirect jurisdiction over activities that generate emissions and contribute to reductions in five of the eight

emissions sectors included in the 2022 Scoping Plan: agriculture, residential and commercial, electric power, recycling and waste, and transportation. COEG has limited influence over high GWP gases, and industrial activities (e.g., industrial production and processes) in the city are limited. Therefore, by excluding these sectors under this approach, community GHG reduction targets have been established in proportion with statewide reductions for all sectors relevant to COEG jurisdiction to the extent feasible using available data. This target setting approach is consistent with the California Supreme Court decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (2015) 62 Cal.4th 204*, which determined that the approach of assessing a project's consistency with statewide emissions reduction goals must include a "reasoned explanation based on substantial evidence" that links the project's emission to the statewide GHG reduction goals.

The first step in determining community targets under this approach is to compare the State's GHG inventories for 1990 and 2021 (i.e., the city's baseline inventory year) for the five relevant sectors. All sectors that were included in the 2022 Scoping Plan are shown below in Table 1 for 1990, 2021, 2030, and 2045. According to the inventories available from CARB, statewide emissions from the relevant sectors were approximately 337 million $MTCO_2e$ ($MMTCO_2e$) in 1990 and 286 $MMTCO_2e$ in 2021 (CARB 2023). Thus, 2021 statewide emissions were approximately 51 $MMTCO_2e$ (15 percent) lower than the 1990 level and the State's 2020 GHG target (i.e., reduce emissions to 1990 levels by 2020).

Table 1 2022 Scoping Plan Estimated Change in Emissions by Sector ($MMTCO_2e$)

GHG Emissions by Sector	1990	2021	2030	2045
Agriculture	26	31	20	15
Residential and Commercial	44	39	27	4
Electric Power	108	62	39	9
High GWP	3	21	10	9
Industrial	98	74	41	12
Recycling and Waste	7	8	9	8
Transportation	152	146	81	8
Carbon Removal Technologies	NA	NA	-7	-75
Total	**438**	**381**	**220**	**-10**
Adjusted Total (Excludes High GWP, Industrial, and Cap-and-Trade Sectors)	*337*	*286*	*176*	*44*

Notes: GHG = greenhouse gas; GWP = global warming potential; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent; NA = not applicable.

Sources: CARB 2022b; CARB 2023.

It is important to note that the 2022 Scoping Plan includes estimated changes in net emissions for the natural and working lands sector (i.e., carbon sequestration) and carbon dioxide removal technologies.

According to the 2022 Scoping Plan, statewide emissions from the sectors relevant to Elk Grove's inventory must be reduced to 44 $MMTCO_2e$, an emissions reduction of approximately 242 $MMTCO_2e$, or 85 percent, by 2045, relative to 2021 levels of 286 $MMTCO_2e$. Therefore, consistent with State targets and goals and considering relevant emissions sectors, Elk Grove's GHG reduction targets are as follows:

- 2030 target: 39 percent below 2021 levels (638,735 $MTCO_2e$); and
- 2045 target: 85 percent below 2021 levels (160,957 $MTCO_2e$).

Table 2 shows how the city's targets were derived based on adjusted statewide GHG emissions data and projections and summarizes the city's legislative-adjusted BAU forecasts and targets for 2030 and 2045.

Table 2 Statewide and Elk Grove Community Legislative-Adjusted BAU Forecasts and GHG Emissions Reduction Targets Below 2021 Levels

Source	2021	2030	2045
Scoping Plan Emissions Limit ($MMTCO_2e$)	381	220	-10
Adjusted Scoping Plan Emissions Limit[1] ($MMTCO_2e$)	NA	286	44
Statewide Target Percent Reduction from 2021 Levels	NA	39%	85%
Elk Grove Community Emissions and Legislative-Adjusted BAU Forecast ($MTCO_2e$)	1,039,181	966,427	483,474
Elk Grove Community Target Percent Reduction Below 2021 Levels	—	39%	85%
Elk Grove Community Target Annual Emissions ($MTCO_2e$)	—	638,812	160,976
Reduction from 2021 Needed to Meet Target ($MTCO_2e$)	—	400,369	878,205
Reduction from Legislative-Adjusted BAU Needed to Meet Target ($MTCO_2e$)	—	327,615	322,498

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent; NA = not available.

[1] Excludes high GWP, industrial, and carbon removal technology sectors because they are not relevant to the city's inventory.

Sources: CARB 2022b; Analysis conducted by Ascent in 2025.

6 GAP ANALYSIS

The purpose of the "gap analysis" is to quantify the suite of GHG reduction strategies that would set the Elk Grove on course to meet its GHG reduction targets for 2030 and 2045. The gap analysis considers several steps in the climate action planning process, which are listed below.

- Summary of the GHG emissions forecasts (per "City of Elk Grove Climate Compass: Final Greenhouse Gas Emissions Forecasts Memorandum" dated June 18, 2025, referred to hereafter as "Forecast Memo");
- Summary of the 2030, 2040, and 2045 GHG emissions reduction targets (see section 5); and
- Quantification of GHG emissions reduction strategies and evaluation of the calculated gap between the estimated GHG reductions and the recommended targets.

GHG reductions associated with these strategies were calculated in a stepwise manner for the years of 2030 and 2045. In other words, GHG reductions (in metric tons of carbon dioxide equivalent [$MTCO_2e$]) are assessed during a snapshot in time in years 2030 and 2045. Strategies are quantified for a single year rather than adding cumulative reductions from prior years, which aligns with the methodology used to derive the Elk Grove's GHG reduction targets and aligns with the California Governor's Office of Land Use and Climate Innovation General Plan Guidelines. Importantly, GHG emissions reductions were quantified for strategies wherever supporting data and reasonable assumptions were available to support calculations. Certain strategies were not quantifiable because of lack of available data or quantification methods but would still be expected to reduce GHG emissions.

Estimates of GHG emissions reductions, along with an estimated emissions "gap" (i.e., the difference between the effective GHG reductions required to meet the targets and the total GHG reductions), are summarized in Table 3 below and illustrated in Figure 1. Detailed strategy calculations and assumptions supporting the GHG reduction estimates are provided in Attachment A.

Table 3 Community GHG Emissions Reduction Strategies

Strategy Number	Strategy Name and Quantified Actions[1]	GHG Reductions ($MTCO_2e$) 2030	GHG Reductions ($MTCO_2e$) 2045
Buildings and Energy (BE)			
BE-1	Electrify and Decarbonize Buildings (BE-1.1, BE-1.2, BE-1.3, RA-4.1)	30,882	176,030
BE-2	Increase Density and Expand Affordable Housing	Included in TR-1	Included in TR-1
BE-3	Increase Local Renewable Energy Use and Storage (BE-3.1)	280,438	0
BE-4	Reduce Energy Consumption and Energy Burden	Included in BE-1	Included in BE-1
	Buildings and Energy Subtotal	**311,321**	**176,030**
Transportation (TR)			
TR-1	Decrease Vehicle Miles Traveled (BE-2.1, TR-1.1, TR-1.2, TR-1.3, TR-1.5)	4,864	5,281
TR-2	Increase Zero-Emission Vehicle Adoption	49,607	110,886
TR-3	Reduce Off-Road Transportation Emissions (TR-3.1, TR-3.3)	9,542	10,856
	Transportation Subtotal	**64,013**	**127,023**
Resilience and Adaptation (RA)			
RA-1	Improve Climate and Emergency Preparedness	N/A	N/A
RA-2	Build Capacity for Current and Future Flooding	N/A	N/A
RA-3	Protect Populations from Wildfire Smoke	N/A	N/A
RA-4	Reduce Exposure to Extreme Heat and Mitigate the Urban Heat Island Effect	Included in RA-5	Included in RA-5
RA-5	Expand the Urban Tree Canopy	185	880
RA-6	Expand Nature-Based Solutions	Included in RA-5	Included in RA-5
	Resilience and Adaptation Subtotal	**185**	**880**
Resource Consumption (RC)			
RC-1	Increase Organic Waste Diversion	4,755	28,775
RC-2	Promote a Circular Economy	Included in RC-1	Included in RC-1
RC-3	Reduce Water Use	140	0
	Resource Consumption Subtotal	**4,895**	**28,775**
Green Economy (GE)			
GE-1	Support Green Businesses	N/A	N/A
	Green Economy Subtotal	**N/A**	**N/A**
Climate Action Commitment (CAC)			
CA-1	Conduct Meaningful Community Outreach	N/A	N/A
CA-2	Provide Community Education on Public Health and Wellbeing	N/A	N/A
CA-3	Provide Community Education on Water Efficiency	N/A	N/A
CA-4	Measure and Manage Climate Action Progress	N/A	N/A
	Climate Action Commitment Subtotal	**N/A**	**N/A**
Total Reductions from Strategies		**380,646**	**333,017**
Reduction Needed to Meet Target		327,615	322,498
Target Met?		**Yes**	**Yes**
Remaining Gap to Target		-53,031	-10,519

Notes: Total may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable.

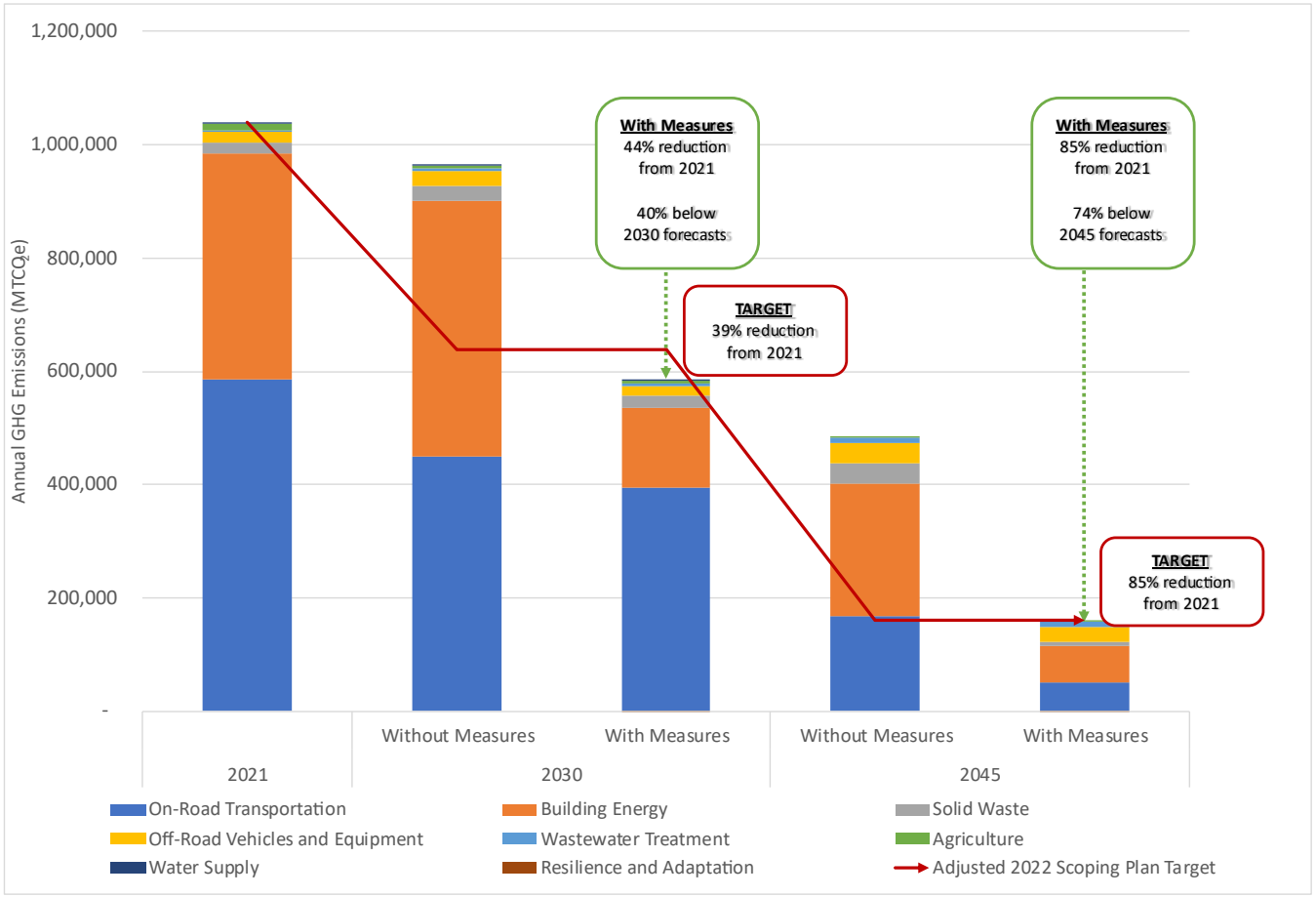
[1] GHG reductions were quantified for either specific actions or across whole strategies, depending on the action or strategy. Where only specific actions were quantified for a given strategy, the associated quantified actions are noted in parenthesis. If strategies were quantified as a whole, no specific actions are noted.

Source: Calculations conducted by Ascent in 2025.

The total estimated GHG emissions reductions from all quantified strategies would be 380,646 $MTCO_2e$ in 2030; and 333,017 $MTCO_2e$ in 2045. This would result in total community GHG emissions of 585,781 $MTCO_2e$ in 2030; and 150,457 $MTCO_2e$ in 2045. The total estimated reductions from all GHG reduction strategies would be sufficient to meet the 2030 and 2045 targets.

Figure 1 shows the GHG reductions achieved by the strategies, organized by the sectors used for the inventories and forecasts (note: the nonresidential and residential building energy sectors have been combined). It shows Elk Grove's emissions with GHG reduction strategies and demonstrates anticipated achievement of the 2030 and 2045 targets. By 2030, the measures would reduce Elk Grove's emissions by 44 percent below 2021 levels, and by 2045, the measures would reduce emissions to 85 percent below 2021 levels. In both milestone years, Elk Grove would exceed its GHG reduction targets with successful implementation of the CAP measures.

Figure 1 Elk Grove Climate Compass Strategies and GHG Emissions Reduction Targets



Notes: GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Analysis conducted by Ascent in 2026.

7 REFERENCES

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CARB. *See* California Air Resources Board.

ATTACHMENT A

Compare Measures

Strategy Summary Sector	Strategy/Action ID	GHG Reductions (MTCO2e) 2030	GHG Reductions (MTCO2e) 2045
Building Energy	BE-1.1	7,479	48,718
Building Energy	BE-1.2	17,345	118,797
Building Energy	BE-1.3	6,059	8,515
Building Energy	BE-3.1	280,438	-
Building Energy	RA-4.3	232	308
On-Road Transportation	BE-2.1	2,775	1,936
On-Road Transportation	TR-1.1	857	243
On-Road Transportation	TR-1.2	520	2,790
On-Road Transportation	TR-1.3	630	203
On-Road Transportation	TR-1.5	82	109
On-Road Transportation	TR-2	49,607	110,886
Off-Road Vehicles and Equipment	TR-3.1	7,815	10,856
Off-Road Vehicles and Equipment	TR-3.3	1,727	-
Resilience and Adaptation	RA-5	185	880
Solid Waste	RC-1	4,755	28,775
Water Supply	RC-3	140	0
	Total	**380,646**	**333,017**
Reduction Targets		327,615	322,498
Meet Targets?		Yes	Yes
Gap		-53,031	-10,519
Leg-Adjusted BAU Emissions		966,427	483,474
Future emissions with measures		585,781	150,457

Target Setting for City of Elk Grove

City of Elk Grove Target Emissions and Target Percent Reduction from 2021 Emissions Levels

Year	City Target Emissions	Target Percent Reduction from 2021	Leg-Adjusted BAU	Difference from Leg-Adj BAU
2021	1,039,181			
2030	638,812	39%	966,427	327,615
2035	468,562	55%	682,572	214,011
2040	324,131	69%	572,760	248,629
2045	160,976	85%	483,474	322,498

2022 CARB Scoping Plan Emissions Targets by Sector

Sectors	CARB's Statewide GHG Inventory 2021	2022 Scoping Plan Scenario 2030	2022 Scoping Plan Scenario 2035	2022 Scoping Plan Scenario 2040	2022 Scoping Plan Scenario 2045	Not included in Scoping Plan. Assumed to be equal to 2045. 2050
Agriculture	31	20	18	17	15	15
Residential and Commercial	39	27	18	10	4	4
Electric Power	62	39	31	28	9	9
High GWP	21	10	10	10	9	9
Industrial	74	41	29	19	12	12
Recycling and Waste	8	9	9	8	8	8
Transportation	146	81	53	27	8	8
CDR	0	-7	-35	-63	-75	-75
Total	**381**	220	133	55	-10	-10
Adjusted Total (include applicable sectors only)	**286**	**176**	**129**	**89**	**44**	**44**

Sources: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-PATHWAYS-data-E3.xlsx.

CARB 2022. California Greenhouse Gas Inventory for 2000-2020 — by Category as Defined in the 2008 Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/ghg_inventory_scopingplan_sum_2000-20.pdf.

Applicable Emission Sectors

Emission Sectors	Applicable to City of Elk Grove?
Agriculture	Yes
Residential and Commercial	Yes
Electric Power	Yes
High GWP	No
Industrial	No
Recycling and Waste	Yes
Transportation	Yes
CDR	No

GHG Reduction Targets

Milestone Year	Statewide Existing and Target Emissions ($MMTCO_2e$)	Target Percent Reduction from 2021	Statewide Existing and Target Emissions ($MMTCO_2e$)	Target Percent Reduction from 2021
2021	381	NA	286	
2030	220	42%	176	39%
2035	133	65%	129	55%
2040	55	86%	89	69%
2045	-10	103%	44	85%
2050	-10	103%	44	85%

CARB Statewide Inventory Applicable Sector Determination by Scoping Plan Categorization

Emissions Sector	Emissions Subsector	Applicable to Elk Grove?	Sector Included in Target Setting?
Agriculture	Livestock	No	No
	Crop Growing and Harvesting	No	
	General Fuel Use	No	
Commercial and Residential	Residential Fuel Use	Yes	Yes
	Commercial Fuel Use	Yes	
	Commercial Co-Generation Heat Output	Yes	
	Other Commercial and Residential	Yes	
Electric Power	In-State Generation	Yes	Yes
	Imported Electricity	Yes	
High-GWP	Ozone depleting substance substitutes	No	No
	Electricity Grid SF6 Losses	No	
	Semiconductor Manufacturing	No	
Industrial	Cement Plants	No	No
	Co-Generation Heat Output	No	
	General Fuel Use	Yes	
	Off Road	Yes	
	Oil & Gas: Production and Processing	No	
	Other Fugitive and Process Emissions	Yes	
	Refineries and Hydrogen Production	No	
Recycling and Waste	Landfills	Yes	Yes
	Composting	Yes	
Transportation	Aviation	No	Yes
	Not Specified	Yes	
	On Road	Yes	
	Rail	No	
	Ships and Commercial Boats	No	

BE-1.1a

Adopt by ordinance a new building reach code (based on cost-effectiveness studies, stakeholder outreach, and California Energy Commission approval) setting energy efficiency standards that must be met by all nonresidential new construction and major renovations.

BE-1.1b

Promote and encourage voluntary actions for the construction of new residential buildings that provide greater energy efficiency and reduced GHG emissions than otherwise required by the building codes.

Apply reach code for new development constructed starting on 01/01/2026.	2021	2025	2030	2045
RESIDENTIAL				
Emissions Reductions				
Gas Usage (therms)	22,858,657	24,715,885	27,037,421	33,595,742
Gas usage in new residential buildings built after 2025 (therms)			2,321,535	8,879,857
Target Electrification Rate			50%	100%
Reduced natural gas usage (therms)			1,160,768	8,879,857
Natural gas emissions factor ($MTCO_2e$/therm)			0.00532	0.00532
GHG reductions from new development natural gas savings ($MTCO_2e$)			**6,177**	**47,257**
Emissions Increases				
Total electricity needed to offset natural gas heating (MWh)			6,191	47,359
Electricity emissions factor ($MTCO_2e$/MWh)			0.1875	-
Additional GHG emissions from grid electricity use due to retrofits ($MTCO_2e$)			**1,161**	**-**
Net GHG Reductions from Residential (MTCO2e)			**5,017**	**47,257**
NON-RESIDENTIAL	2021	2025	2030	2045
Natural Gas Usage (therms)	4,716,141	5,709,006	6,950,086	10,424,502
Gas usage in new nonresidential buildings built after 2025 (therms)			1,241,081	4,715,496
EMISSIONS REDUCTIONS				
Target Electrification Rate [1]			50%	100%
Reduced natural gas usage (therms)			620,540	4,715,496
Natural gas emissions factor ($MTCO_2e$/therm)			0.00532	0.00532
GHG reductions from existing development natural gas savings ($MTCO_2e$)			**3,302**	**25,095**
EMISSIONS INCREASES FROM RETROFIT OF EXISTING NON-RESIDENTIAL BUILDINGS				
Total electricity needed to offset natural gas heating (MWh)			4,476	34,010
Electricity emissions factor ($MTCO_2e$/MWh)			0.1875	-
Additional GHG emissions from grid electricity use due to retrofits ($MTCO_2e$)			**839**	**-**
EMISSIONS INCREASES FROM ADDITIONAL BACKUP GENERATORS USED DUE TO RETROFIT OF EXISTING NON-RESIDENTIAL BUILDINGS				
Forecasted electricity use in non residential buildings built through 2025 (MWh)	416,332	505,404	616,744	928,441
Existing electricity Use in non-residential buildings built through 2025 (MWh)			505,404	505,404
Percent increase in electricity consumption due to retrofits after measure (%) [1]			1%	7%
Forecasted emissions from non-residential diesel use in back up generators before measure ($MTCO_2e$)	71	88	109	168
Emissions from existing non-residential diesel use in back up generators built through 2025 before measure ($MTCO_2e$)			88	88

Apply reach code for new development constructed starting on 01/01/2026.	2021	2025	2030	2045
Additional GHG emissions from diesel use in backup generators after measure ($MTCO_2e$)			**0.8**	**5.9**
Forecasted emissions from non-residential LPG use in backup generators before measure ($MTCO_2e$)	0.7	0.8	1.0	1.6
Emissions from existing non-residential LPG use in backup generators built through 2025 before measure ($MTCO_2e$)			0.8	0.8
Additional GHG emissions from LPG use in backup generators after measure ($MTCO_2e$)			**0.0**	**0.1**
Forecasted emissions from non-residential diesel use in backup generators before measure ($MTCO_2e$)	0.7	0.9	1.1	1.8
Emissions from existing non-residential natural gas use in backup generators built through 2025 before measure ($MTCO_2e$)			0.9	0.9
Additional GHG emissions from natural gas use in backup generators after measure ($MTCO_2e$)			0.0	0.1
Additional GHG emissions from backup generators after measure ($MTCO_2e$)			**0.79**	**6.04**
Net GHG Reductions from Non-Residential ($MTCO_2e$)			**2,462**	**25,089**
Net GHG Reductions ($MTCO_2e$)			**7,479**	**72,346**
Total Net Emissions from Reduced Electricity Use ($MTCO_2e$)			-2,000	—

Notes: Calculations do not include major renovations.

Sources: [1] Assumes that if electricity consumption goes up X%, then backup gen usage goes up by the same percent.

[2] U.S. DOE 2024. Furnaces and Boilers. Available: https://www.energy.gov/energysaver/furnaces-and-boilers.

[3] EPA 2023. ENERGY STAR Most Efficient 2024. (Air Source Heat Pumps. Assumed a conservative SEER rating of 15. Converted to Coefficient of Performance (COP) by multiplying by 0.293. A COP of 2 = 200% efficiency.) https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Most%20Efficient%202024%20Final%20Criteria%20Memo%20-%20Revised_12-2023.pdf#:~:text=URL%3A%20https%3A%2F%2Fwww.energystar.gov%2Fsites%2Fdefault%2Ffiles%2Fasset%2Fdocument%2FENERGY%2520STAR%2520Most%2520Efficient%25202024%2520Final%2520Criteria%2520Memo%2520.

SEER to COP conversion from: https://www.sciencedirect.com/topics/engineering/seasonal-energy-efficiency-ratio#:~:text=SEER%20is%20very%20similar%20to,per%20unit%20of%20work%20energy.).

Calculations for estimating effective efficiency of transition of residential buildings from natural gas infrastructure to electric

Assumed average efficiency of natural gas heating (conservative) [2]	80%
Assumed average efficiency of electric heating for non-residential buildings [3]	440%
MWh per therm conversion	0.0293
Number of therms of electricity needed to produce the same amount of heat as one therm of natural gas.	0.18

Calculations for estimating effective efficiency of transition of non-residential buildings from natural gas infrastructure to electric

Assumed average efficiency of natural gas heating (conservative) [2]	80%
Assumed average efficiency of electric heating for non-residential buildings [3]	325%
MWh per therm conversion	0.0293
Number of therms of electricity needed to produce the same amount of heat as one therm of natural gas.	0.25

BE-1.2

Develop a comprehensive building energy retrofit plan to transition existing residential and nonresidential buildings to all-electric.

Retrofit Existing Residential buildings.	2021	2025	2030	2045
Gas Usage (therms)	22,858,657	24,715,885	27,037,421	33,595,742
Gas usage in existing residential buildings built through 2025 (therms)			24,715,885	24,715,885
EMISSIONS REDUCTIONS				
Target Electrification Rate [1]			14%	68%
Reduced natural gas usage (therms)			3,559,087	16,905,666
Natural gas emissions factor ($MTCO_2e$/therm)			0.00532	0.00532
GHG reductions from existing development natural gas savings ($MTCO_2e$)			**18,941**	**89,969**
EMISSIONS INCREASES				
Effective therms offset from transitioning natural gas heating use to electrification (therms)			647,843	3,077,254
Total electricity needed to offset natural gas heating (MWh)			18,982	90,164
Leg-Adjusted Electricity emissions factor ($MTCO_2e$/MWh) (SMUD)			1.88E-01	0.00E+00
Additional GHG emissions from electricity use ($MTCO_2e$)			**3,559**	**-**
Calculations for estimating effective efficiency of transition of residential buildings from natural gas infrastructure to electric				
Assumed average efficiency of natural gas heating (conservative) [2]			80%	
Assumed average efficiency of electric heating for non-residential buildings [3]			440%	
MWh per therm conversion			0.0293	
Number of therms of electricity needed to produce the same amount of heat as one therm of natural gas.			0.18	
Net GHG Reductions from Residential Buildings ($MTCO_2e$)			**15,381**	**89,969**
Retrofit existing NONRESIDENTIAL buildings.	2021	2025	2030	2045
Natural Gas Usage (therms)	4,716,141	5,709,006	6,950,086	10,424,502
Gas usage in existing nonresidential buildings built through 2025 (therms)			5,709,006	5,709,006
EMISSIONS REDUCTIONS				
Target Electrification Rate [1]			9%	46%
Reduced natural gas usage (therms)			494,713	2,637,542
Natural gas emissions factor ($MTCO_2e$/therm)			0.00532	0.00532
GHG reductions from existing development natural gas savings (MTCO2e)			**2,633**	**14,037**
EMISSIONS INCREASES FROM RETROFIT OF EXISTING NON-RESIDENTIAL BUILDINGS				
Total therms offset from transitioning natural gas heating use to electrification (therms)			121,776	649,241
Total electricity needed to offset natural gas heating (MWh)			3,568	19,023
Electricity emissions factor ($MTCO_2e$/MWh)			0.1875	-
Additional GHG emissions from grid electricity use due to retrofits ($MTCO_2e$)			669	-

Retrofit Existing Residential buildings.	2021	2025	2030	2045
EMISSIONS INCREASES FROM ADDITIONAL BACKUP GENERATORS USED DUE TO RETROFIT OF EXISTING NON-RESIDENTIAL BUILDINGS				
Forecasted electricity use in non-residential buildings built through 2025 (MWh)	416,332	505,404	616,744	928,441
Existing electricity Use in non-residential buildings built through 2025 (MWh)			505,404	505,404
Percent increase in electricity consumption due to retrofits after measure (%) [4]			1%	4%
Forecasted emissions from non-residential diesel use in backup generators before measure ($MTCO_2e$)	71	88	109	168
Emissions from existing non-residential diesel use in backup generators built through 2026 before measure ($MTCO_2e$)			88	88
Additional GHG emissions from diesel use in backup generators after measure ($MTCO_2e$)			0.6	3.3
Forecasted emissions from non-residential diesel use in backup generators before measure ($MTCO_2e$)	0.7	0.8	1.0	1.6
Emissions from existing non-residential LPG use in backup generators built through 2026 before measure ($MTCO_2e$)			0.8	0.8
Additional GHG emissions from LPG use in backup generators after measure ($MTCO_2e$)			0.0	0.0
Forecasted emissions from non-residential diesel use in backup generators before measure ($MTCO_2e$)	0.7	0.9	1.1	1.8
Emissions from existing non-residential natural gas use in backup generators built through 2026 before measure ($MTCO_2e$)			0.9	0.9
Additional GHG emissions from natural gas use in backup generators after measure ($MTCO_2e$)			0.0	0.0
Additional GHG emissions from backup generators after measure ($MTCO_2e$)			0.63	3.38
Net GHG Reductions from Non-residential Buildings ($MTCO_2e$)			1,963	14,033
Net GHG Reductions ($MTCO_2e$)			**17,345**	**104,003**
Total Net Emissions from Reduced Electricity Use ($MTCO_2e$)			*-4,229*	-

[1] Assumes that implementation starts in 2026 with a 3.5% achievable rate per year.

Sources: [1] Mozingo. 2021. Zero-Carbon Buildings in California: A Feasibility Study.

[2] U.S. DOE 2024. Furnaces and Boilers. Available: https://www.energy.gov/energysaver/furnaces-and-boilers.

[3] EPA 2023. ENERGY STAR Most Efficient 2024. (Air Source Heat Pumps. Assumed a conservative SEER rating of 15. Converted to Coefficient of Performance (COP) by multiplying by 0.293. A COP of 2 = 200% efficiency.) https://www.energystar.gov/sites/default/files/asset/document/ENERGY%20STAR%20Most%20Efficient%202024%20Final%20Criteria%20Memo%20-%20Revised_12-2023.pdf#:~:text=URL%3A%20https%3A%2F%2Fwww.energystar.gov%2Fsites%2Fdefault%2Ffiles%2Fasset%2Fdocument%2FENERGY%2520STAR%2520Most%2520Efficient%25202024%2520Final%2520Criteria%2520Memo%2520.

SEER to COP conversion from: https://www.sciencedirect.com/topics/engineering/seasonal-energy-efficiency-ratio#:~:text=SEER%20is%20very%20similar%20to,per%20unit%20of%20work%20energy).

[4] Assumes that if electricity consumption goes up X%, then backup gen usage goes up by the same percent.

Calculations for estimating effective efficiency of transition of non-residential buildings from natural gas infrastructure to electric

Assumed average efficiency of natural gas heating (conservative) [2]	80%
Assumed average efficiency of electric heating for non-residential buildings[3]	325%
MWh per therm conversion	0.0293
Number of therms of electricity needed to produce the same amount of heat as one therm of natural gas.	0.25

Calculate weighted average target electrification rates from Mozingo [1]

		2030	2045
Prorate reductions based on number of years policy will be in effect assuming implementation date of 2026	res	18%	72%
	nonres	7%	40%
Natural gas usage by building type	res	19%	19%
	nonres	81%	81%
weighted average electrification rate		9%	46%

Support the conversion of HVAC to heat pump systems.

Uses results and assumptions from LocalEnergyCodes.com cost-effectiveness studies

	2021	2030	2045
Affected Units by Build Year(Existing Single Family Homes)			
Pre-1978	2,546		
1979-1991	3,443		
1992-2005	12,243		
Total	**18,232**		
Local Energy Code Input Assumptions			
Program duration (years)	5		
Average Age of A/C Units (years)	15		
Percentage of units replaced per year (Penetration Rate)	7%		
Installation Time (years)	1		
Applicability Rate (Percent of eligible homes that will actually install the required measure.)	50%		
Cumulative percentage of existing units replaced (100% by 2041) [1]		0%	100%
Annual Gas Savings (therms) [2]		0	2,780,000
Natural gas emissions factor (MTCO2e/therm)		0.00532	0.00532
Savings per Home (therms/unit)		0	152
Net GHG Reductions (MTCO2e)		**0**	**14,795**
Total Net Emissions from Reduced Electricity Use (MTCO2e)		-	-

[1] Assumes that implementation starts in 2026 with a 3.5% achievable rate per year, based on the Mozingo study.

Sources:

[2] Modeled in LocalEnergyCodes.com for the City of Elk Grove. See separately attached documentation for model outputs.

BE-1.3

Explore partnerships with regional organizations or grant opportunities to develop a funding mechanism (e.g., revolving loan fund, grant program) to provide low-interest loans to low-income residents to cover the time-of-replacement/emergency replacement of water heaters and/or HVAC units with electric options.

	2021	2023	2025	2030	2045
Number of Single Family Home Units [1],[2]	47,786	47,235	51,195	61,096	81,984
Percent of Households in Single Family Homes in Elk Grove that are occupied by low income households [3]	10%	10%	10%	10%	10%
Affected Units (assuming program lasts 5 years from 2026 through 2030)				6,110	6,110
Heat Pump HVAC Replacements					
Assumptions Modeled in LocalEnergyCodes.com					
Program duration (years)	5				
Average Lifespan of A/C Units (years)	15				
Percentage of units replaced per year (Penetration Rate)	7%				
Installation Time (years)	1				
Applicability Rate (Percent of eligible homes that will actually install the required measure.)	0.2				
Modeled Affected Units (for per-unit calculations only)				2,500	2,778
Annual Modeled Gas Savings (for per-unit calculations only)				395,726	424,219
Annual Savings per Home (therms/unit) [4]				158	153
Annual Gas Savings (therms) [4]				966,895	932,862
Natural gas emissions factor (MTCO2e/therm)				0.00532	0.00532
Gas-Related Emissions reductions from Heat Pump HVAC Replacements (MTCO2e)				**5,146**	**4,965**
Annual Electricity Savings (for per-unit calculations only)				-3,660,000	-3,920,000
Annual Electricity Savings per Home (kWh/unit) [4]				-1,464	-1,411
Annual Electricity Savings (kWh) [4]				-8,942,645	-8,620,123
Electricity emissions factor (MTCO2e/MWh)				0.188	0.000
Electricity-related Emissions reductions from Heat Pump HVAC Replacements (MTCO2e)				**-1,677**	**0**
Heat Pump Water Heater Replacements					
Assumptions Modeled in LocalEnergyCodes.com					
Program duration (years)	5				
Average Lifespan of Water Heater Units (years)	12				
Percentage of units replaced per year (Penetration Rate)	8%				
Installation Time (years)	1				
Applicability Rate (Percent of eligible homes that will actually install the required measure.)	20%				
Modeled Affected Units (for per-unit calculations only) [4]				2,500	2,778
Annual Modeled Gas Savings (for per-unit calculations only) [4]				283,041	303,420
Annual Gas Savings per Home (therms/unit)				113.19	109.21

	2021	2023	2025	2030	2045
Annual Gas Savings (therms)				691,567	667,224
Natural gas emissions factor (MTCO2e/therm)				0.00532	0.00532
Gas-related Emissions reductions from Heat Pump Water Heater Replacements (MTCO2e)				**3,680**	**3,551**
Annual Electricity Savings (for per-unit calculations only)				-2,380,000	-2,550,000
Annual Electricity Savings per Home (kWh/unit) [4]				-952	-857
Annual Electricity Savings (kWh) [4]				-5,815,163	-5,233,646
Electricity emissions factor (MTCO2e/MWh)				0.1875	-
Electricity-related Emissions reductions from Heat Pump Water Heater Replacements (MTCO2e) (negative reduction = increased emissions)				**-1,090**	**-**
Net GHG Reductions (MTCO2e)				**6,059**	**8,515**
Total Net Emissions from Reduced Electricity Use (MTCO2e)				*-2,767*	-

Sources: [1] U.S. Census Bureau. American Community Survey 2021. Table DP04. https://data.census.gov/table/ACSDP1Y2021.DP04?q=DP04&g=160XX00US0622020.

[2] U.S. Census Bureau. American Community Survey 2023. Table DP04. https://data.census.gov/table/ACSDP1Y2023.DP04?q=DP04&g=160XX00US0622020.

[3] Need data on this. 10% is a placeholder.

[4] Given that the program under this measure is assumed to last for 5 years from 2026 through 2030. Localenergycodes.com accounts for an average unit mortality rate of 30 years. After 30 years, no additional savings would occur, therefore, there are decreasing savings per unit by 2045.

BE-3.1

Support and coordinate with SMUD in executing its 2030 Zero Carbon Plan.

SMUD's 100% carbon-free 2030 plan.	2030	2045
Total electricity emissions (MTCO2e)	271,556	0
Activated Measures List (Lists Only Activated Measures) (Net Increase in Electricity-Related Emissions from other measures)		
BE-1.1	2,000	0
BE-1.2	4,229	0
BE-1.3	2,767	0
RA-4.3	-114	0
Total increase in emissions from other measures due to increased electricity use	*-8,882*	*0*
Adjusted electricity emissions reductions from 100% carbon-free electricity (MTCO2e)	280,438	0
GHG Reductions (MTCO2e)	280,438	—

BE-2.1

Prepare and adopt land use plan and zoning revisions that increase the allowed density and intensity of development along the city's major transit corridors.

	2021	2025	2030	2045
Annual Passenger VMT	944,367,693	1,020,155,928	1,114,891,221	1,383,927,302
New VMT after 2025			94,735,293	363,771,375
New VMT Reductions from other measures			2,607,254	56,490,624
TR-1			*272,198*	*1,142,306*
TR-2			*2,134,866*	*54,394,360*
TR-3			*200,178*	*953,724*
TR-5			*12*	*233*
Adjusted New VMT after 2025			92,128,039	307,280,751
Population	179,287	201,480	229,222	307,593
New Population as of 2026			27,742	78,371
Annual VMT per Capita for New Population			3,321	3,921
CAPCOA T-3 (Provide Transit Oriented Development) Assumptions				
Transit mode share in the Sacramento-Roseville-Arden-Arcade statistical area[1] (2.9% is default) (B) [2]			*2.0%*	*2.0%*
Auto mode share in the Sacramento-Roseville-Arden-Arcade statistical area[1] (95.04% is default) (D) [2]			*87.0%*	*87.0%*
Ratio of transit mode share for TOD area with measure compared to existing transit mode share in surrounding city (unitless constant) [1] (C)	4.9			
Percent Reduction in VMT			11%	11%
Population affected by Increased Density			*27,742*	*78,371*
VMT associated with affected population			92,128,039	307,280,751
Reduced VMT associated with affected population under measure			10,377,641	34,613,234
Average Leg-Adjusted BAU Passenger Vehicle Emissions per Mile (gCO2e/mi)			267	56
GHG Reductions from BE-2.1 (MTCO2e)			**2,775**	**1,936**
Light Duty VMT Reduction			10,377,641	34,613,234

Sources:

[1] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity-Final Draft*.

[2] Assumption based on work commute mode share. Community-wide mode share is not readily unavailable.

TR-1.1

Implement the infrastructure, programmatic, and policy recommendations included in the Bicycle, Pedestrian, and Trails Master Plan.

		2021	2025	2030	2045
All Passenger VMT		944,367,693	1,020,155,928	1,114,891,221	1,383,927,302
Existing VMT as of 2025				1,020,155,928	1,020,155,928
New VMT after 2025				94,735,293	363,771,375
CAPCOA T-18 (Provide Pedestrian Network Improvement) Assumptions					
New Sidewalk (sidewalk + multiuse paths) Miles [2] (C)				45	45
Existing Sidewalk Miles [3] (B)				962	965
Percent reduction in GHG emissions by providing Pedestrian Network Improvement (T-18, ND) [1]	Max Reduction 6.40%			**0.23%**	**0.23%**
CAPCOA T-20 (Expand Bikeway Network) Assumptions					
Active Transportation Adjustment Factor - Bicycle Mode Share (D)				0.0056	0.0056
Vehicle mode share (E)				0.9504	0.9504
Average one-way bike trip length (F) (mi)				2.90	2.90
Average one-way vehicle trip length (G) (mi)				10.9	10.9
New Bike lane miles by 2030 with Measure relative to existing [2][3] (C-B)				50	147
Existing Bike/Ped Lane Miles (all classes) [4] (B)				139	139
Percent reduction in GHG emissions from displaced vehicles on roadway with bicycle boulevard (T-19-B, ND) [1]	Max Reduction 0.50%			**0.053%**	**0.081%**
Reduction in New VMT with TR-1.1 measures (miles)				**272,198**	**1,142,306**
Reduction in Existing VMT with TR-1.1 measures (miles)				**2,931,165**	**3,203,468**
Average Leg-Adjusted BAU Passenger Vehicle Emissions per Mile (gCO2e/mi)				267	56
Reduction in New VMT - Passenger Vehicle Emissions (MTCO2e)				73	64
Reduction in Existing VMT - Passenger Vehicle Emissions (MTCO2e)				784	179
GHG Reductions from TR-1.1 (MTCO2e)				**857**	**243**
Light Duty VMT Reduction				3,203,364	4,345,774

Notes: Multiple measures are quantified in this sheet together as these measures are lumped together under the "Neighborhood subsector" in CAPCOA, 2021. CAPCOA, 2021 defines one single number (% reduction) for the whole sector.

Sources:

[1] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity-Final Draft*.

[2] Pers. Comm. Whitlock. E-mail from Carrie Whitlock of COEG to Hannah Kornfeld of Ascent on December 18, 2024 regarding new sidewalk and bikeway miles.

[3] Pers. Comm. Whitlock. Phone conservation with Carrie Whitlock of COEG and Claire Moss of Ascent on May 2, 2025 regarding new bikeway miles.

[4] Trail + non-trail bike/ped lanes. *COEG Bicycle, Pedestrian, and Trails Master Plan*. Page 51 and Table 4. https://www.elkgrovecity.org/sites/default/files/city-files/Departments/SPI/BPTMP/May%202021%20Final%20BPTMP%20Plan.pdf.

TR-1.2

Coordinate with SacRT to improve the city's public transit system by increasing reliability and accessibility as well as by adding amenities such as seating, lighting, tree cover, and real-time arrival information displays. Extend service hours and routes to better serve residential areas, employment centers, and popular destinations, with a focus on "Transportation-Based Priority Populations" as identified by Caltrans' Transportation Equity Index.

	2030	2045
Annual New passenger vehicle miles traveled (VMT) after TR-1.1 (to avoid double counting)	94,463,095	362,629,069
Percent reduction in citywide passenger VMT from extended transit coverage or hours (up to 4.6% VMT reduction) (T-24, T) [1] [2, page 19] [3]	*2.3%*	*4.6%*
Percent reduction in citywide passenger VMT from increased transit service frequency (up to 11.3% VMT reduction) (T-25, T) [1] [4]	*11.3%*	*11.3%*
Percent reduction in citywide passenger VMT from implementing transit-supportive roadway treatments (up to 0.6% VMT reduction) (T-26, T) [1] [3]	*0.6%*	*0.6%*
Total percent reduction (up to 15% combined VMT reduction)	***2.3%***	***15.0%***
Passenger VMT reduction	2,134,866	54,394,360
Passenger vehicle emissions factor (g CO2e/mi)	244	51
GHG reductions from passenger vehicles (MTCO2e)	**520**	**2,790**
GHG Reductions from TR-1.2 (MTCO2e)	**520**	**2,790**
Light Duty VMT Reduction	2,134,866	54,394,360

Notes: VMT reductions are only applied to existing passenger VMT so as not to double count with maximum reductions achieved under TR-1.1 which affects new passenger VMT.

Maximum reduction taken for Transit subcategory per CAPCOA 2021 in 2045

SacRT added new trips connecting UC David Med Center to Elk Grove [4]

SacRT plans to add a BRT or Light Rail extension to Elk Grove (e.g., to the new zoo) [3]

SacRT has incremental improvements to frequency one line at a time. At this time, there are no specific plans to improve frequency to routes serving Elk Grove, but it is possible that RT could expand their frequency improvements to Elk Grove lines in the future. [4]

Sources:

[1] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity-Final Draft*.

[2] https://www.sacrt.com/wp-content/uploads/SacRT-Capital-Projects-and-2024-Outlook-Feb-2024.pdf.

[3] Blue Line Light Rail Extension and/or Bus Rapid Transit to Elk Grove: https://www.sacrt.com/projects/.

[4] https://www.sacrt.com/wp-content/uploads/SacRT-Board-of-Directors-March-11-2024-Agenda-Item-2.5-1.pdf.

TR-1.3

Develop a local Transportation Management Agency, which works with residences and businesses to provide education on transit and alternative transportation services and programs, and provides other supportive programs that work to reduce VMT and increase transit use.

		2030	2045
Workforce population in Elk Grove (Number of Jobs)		71,638	110,336
CAPCOA T-7 Assumptions (Implement Commute Trip Reduction Marketing [1]			
Percent of Employees Eligible for Program		*25%*	*25%*
Percent Reduction in Employee Commute Trips [1]		4%	4%
Adjustment from vehicle trips to VMT (unitless)		1	1
Percent Reduction in Commute VMT		1%	1%

SACOG Travel Survey (2018) [2]

Work and Work-Related Trips by Mode for the Sacramento Area

Mode	Percent
Walk	7%
Bike	2%
Car	87%
TNC	0%
Transit	2%
Other	2%

Work and Work-Related Trips Distances for the Sacramento Area	Percent	Median Length		
<2 miles	27%	1	0	2
2-3.9	17%	2.95	2	3.9
4-5.9	10.50%	4.95	4	5.9
6-7.9	8%	6.95	6	7.9
8-9.9	7.00%	8.95	8	9.9
10-11.9	5%	10.95	10	11.9
12-13.9	4.70%	12.95	12	13.9
14-15.9	4.50%	14.95	14	15.9
16-17.9	4.00%	16.95	16	17.9
18-19.9	2%	18.95	18	19.9
>20	11%	20	>20	
	Miles			
Average Work Trip Distance (mi)	7.6			
Average Work Two-Way Trip Distance (mi)	15.1			
Working Days per Year	250			
Percent of Work Trips by Car	87%			
Average Car Commute Miles per Year Per Job (mi/job/year)	3,288			

		2030	2045
Commute Miles per Year in Elk Grove		235,578,916	362,833,623
Reduced Commute Miles under TR-1.3		2,355,789	3,628,336
Reduction in VMT with TR-1.3 (miles)		**2,355,789**	**3,628,336**
Reduction in VMT with TR-1.3 (miles) (new)		200,178	953,724
Reduction in VMT with TR-1.3 (miles) (existing)		2,155,611	2,674,612
Average Passenger Miles Emissions Factor (gCO2e/mi)		267	56
GHG Reductions from TR-1.3 (MTCO2e)		**630**	**203**
Light Duty VMT Reduction		2,355,789	3,628,336

Notes:

[1] CAPCOA, 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity-Final Draft*.

[2] SACOG. *SACRAMENTO REGIONAL TRANSPORTATION STUDY Analysis Report*. Nov 2018. Figures 48 and 49. https://www.sacog.org/home/showpublisheddocument/1494/638349466651100000.

[3] based on forecasted ratio of new to existing VMT.

TR-1.5

Partner with Elk Grove Unified School District (EGUSD) to establish and better monitor Safe Routes to School programs aimed at promoting safe walking, biking, and other active transportation modes for students and families.

Metropolitan Transportation Commission Safe Route to Schools Program Results [1]

County	Total Annual Reduction in Emissions (lbs)	Public School Enrollment	Percent Change in GHG Emissions Compared to No Program	Population Density (People per square mile) [2]	Calculated Annual Reduction per Student (lb CO2e/student)
Alameda	53,982	9,761	-9.3%	2,193	5.5
San Francisco	273	5,299	-0.2%	17,238	0.1
San Mateo	136,360	14,877	-17.2%	1,708	9.2
Santa Clara	196,560	29,256	-10.9%	1,449	6.7
Sonoma	16,637	5,992	-5.6%	305	2.8
Total	**403,812**	**65,185**	**-4.8%**		
City of Elk Grove Population Density [2]	3,627				
Approximate Annual Emissions Reduction Per Student based on MTC Safe Route to School Program Results based on Elk Grove Population Density (lbs CO2e/student)	3				
Approximate Annual Emissions Reduction Per Student based on MTC Safe Route to School Program Results based on Elk Grove Population Density (gCO2e/student)	1,361				

	2021	2030	2045
Elk Grove Unified School District Student Population [3]	62917	80,441	80,441
Percent Implemented		*75%*	*100%*
Annual Emissions Reductions (MT CO2e)		82	109
Reduced GHG Emissions (MTCO2e)		82	109
Emission Factor (gCO2e/mi)		267.40	55.92
Light Duty VMT Reduction		139	888
Reduction in VMT (new)		12	233
Reduction in VMT (existing)		127	655

Sources:

[1] Table 6 from MTC's Climate Initiatives Program Evaluation. Regional Safe Routes to School Program. 2015. https://mtc.ca.gov/sites/default/files/MTC_Regional_SRTS_Evaluation_Report_Final.pdf.

[2] Estimated using Co-Pilot for 2021. "What is the population density of the City of Elk Grove compared to the Counties of Alameda, San Francisco, San Mateo, Santa Clara, and Sonoma?" Used for comparison purposes only.

[3] https://www.caschooldashboard.org/reports/34673140000000/2021. Forecasts scaled by population projections.

TR-2

Increase Zero-Emission Vehicle (ZEV) Adoption

	2021	2030	2045
City of Elk Grove population	179,287	229,222	307,593
Sacramento County population	1,549,172	1,679,851	1,897,648
Population ratio (City vs County)	0.1157	0.1365	0.1621
Increase Light Duty EV adoption			
EV Forecasts and Targets			
EMFAC2021 ACC II Light Duty Pop - Countywide [1]		1,050,168	1,177,619
EMFAC2021 ACC II Light Duty Pop - Elk Grove		143,300	190,883
EMFAC2021 ACC II Light Duty EV/PHEV Pop - Countywide [1]		181,399	912,816
EMFAC2021 ACC II Light Duty EV/PHEV Pop - Elk Grove		24,753	147,960
Calculated EMFAC2021 ACC II Light Duty EV/PHEV percentage		17%	78%
Targeted EV/PHEV Pop percentage under TR-2		25%	87%
Increased EV/PHEV Pop percentage under TR-2		8%	9%
Targeted EV/PHEV Pop under TR-2		35,825	166,068
Additional EV/PHEV Pop under TR-2		11,072	18,108
EMFAC2021 EV:PHEV Ratio with ACC II adjustments		4	9
Additional EV Pop under TR-2		9,011	16,245
Additional PHEV Pop under TR-2		2,061	1,863
Additional GHG emissions from EVs			
Average annual miles per EV (mi/vehicle) [1]		16,490	13,820
New EV VMT under measure		148,597,810	224,501,022
Reduced Light Duty VMT under Other Measures		18,071,660	96,981,704
TR-1.1		*3,203,364*	*4,345,774*
TR-1.2		*2,134,866*	*54,394,360*
TR-1.3		*2,355,789*	*3,628,336*
TR-1.5			
BE-2.1		*10,377,641*	*34,613,234*
Total Forecasted Light Duty VMT		*1,096,819,561*	*1,321,558,832*
Overall Percent Reduction in Light Duty VMT		*1.65%*	*7.34%*
Adjusted New EV VMT under measure		146,149,450	208,026,166
Average Efficiency of EV LDV (kWh/100-mi) [2]		*38.60*	*38.60*
Charged amount (kWh)		56,413,688	80,298,100
Charged amount (MWh)		56,414	80,298
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		1.88E-01	0.00E+00
Additional GHG emissions from EVs (MTCO2e)		10,579	—
Average emissions factor from EV (gCO2e/mi) [1]		72	—

	2021	2030	2045
Additional GHG emissions from PHEVs			
Average annual miles per PHEV (mi/vehicle) [1]		15,527	13,256
New PHEV VMT under measure		31,998,418	24,693,442
Adjusted New PHEV VMT under measure		31,471,198	22,881,330
Average emissions factor from PHEV (gCO2e/mi) [1]		167	129
Additional PHEV emissions under measure from electricity and fossil fuel (MTCO2e)		5,242	2,944
Share of eVMT from total PHEV VMT (%)		56.87%	59.26%
Adjusted New PHEV eVMT under measure		17,898,460	13,559,451
Average Efficiency of EV LDV (kWh/100-mi) [2]		38.60	38.60
Charged amount (kWh)		6,908,806	5,233,948
Charged amount (MWh)		6,909	5,234
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		1.88E-01	0.00E+00
Additional PHEV emissions under measure from electricity only (MTCO2e)		1,296	—
Emissions avoided from Equivalent Gasoline/Diesel Vehicles			
Average emissions factor from Gasoline/Diesel mix (gCO2e/mi) [1]		315	306
Average annual miles per Gasoline/Diesel (mi/vehicle) [1]		11,660	6,593
Reduced Gasoline/Diesel VMT (mi)		180,596,228	249,194,464
Reduced Gasoline/Diesel emissions under Measure (MTCO2e)		56,817	76,258
Light Duty EV Charger Demand			
Statewide Target under CEC's Additional Achievable Transportation Electrification 3 (AAT3) [4]			
Total Statewide ZEVs under AAT3 [6]		7,063,451	[9]
Statewide Public Charger Targets (excludes SF and MF housing charging)		401,302	[9]
EVs:Public and Shared Private charger ratio [5]		18	18
Current/Future Public Chargers needed to support future EV population in Elk Grove	170.00	2,035	9,435
New Public and Shared Private Chargers needed		1,865	9,265
Total Emission Reductions from Increased LDV EV/PHEV Mix (MTCO2e)		**39,701**	**73,314**

Increase Medium and Heavy-Duty EV adoption

State-level EV Forecasts and Targets	2021	2030	2045
Statewide Medium- and Heavy-Duty Population [3]		2,057,328	2,358,292
Statewide Medium- and Heavy-Duty EV population [3]		107,184	797,170
Statewide HDV/MDV EV Population Target under ACF [1]		167,875	1,459,868
Statewide Target Percent Increase in Commercial EVs		**57%**	**83%**
Elk Grove Target Percent Increase in Commercial EVs		65%	90%
Calculated Medium/Heavy Duty EV/PHEV Pop - Elk Grove		**1,283**	**2,579**
Increased EV/PHEV Pop percentage under TR-2		65%	90%
Targeted EV/PHEV Pop under TR-2		2,117	4,900
Additional EV/PHEV Pop under TR-2		834	2,321

State-level EV Forecasts and Targets	2021	2030	2045
Additional GHG emissions from EVs			
Average annual miles per EV (mi/vehicle) [1]		23,396	19,726
New eVMT under measure		19,510,672	45,781,714
Average Efficiency of EV medium/heavy duty (kWh/100-mi) [1]		112	111
Charged amount (kWh)		21,832,347	51,019,743
Charged amount (MWh)		21,832	51,020
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		1.88E-01	0.00E+00
Additional GHG emissions from EVs (MTCO2e)		4,094	—
Emissions from Equivalent Displaced Gasoline/Diesel Vehicles			
Average emissions factor from Gasoline/Diesel mix (gCO2e/mi) [1]		1,193	1,139
Average annual miles per Gasoline/Diesel Vehicle (mi/vehicle) [1]		14,069	14,215
Reduced Gasoline/Diesel VMT (mi)		11,732,358	32,992,627
Reduced Gasoline/Diesel emissions under Measure (MTCO2e)		14,001	37,572
Medium- and Heavy-Duty EV Charger Demand [7]			
Statewide Target under CEC's Additional Achievable Transportation Electrification 3 (AAT3) [4]			
Forecasted Medium and Heavy Duty Plug-in Evs		155,000	[9]
Statewide Depot Charger Needs		109,000	[9]
Statewide Public Charger Needs		5,500	[9]
Total Public and Depot Med/HD Chargers		114,500	[9]
MD/HD EVs:Public and Depot charger ratio [5]		1.35	1.35
Current/Future Public Chargers needed to support future EV population in Elk Grove [8]	0	1,564	3,619
New Public and Depot Chargers needed		1,564	3,619
Net GHG emissions avoided from increased MHDV EV chargers (MTCO2e)		**9,907**	**37,572**
Net GHG emissions avoided from increased EV chargers (MTCO2e)		**49,607**	**110,886**

Sources:

[1] EMFAC 2021 results for Sacramento County adjusted for ACC II ZEV requirements for new vehicles. Requirements pertain to both PHEVs and ZEVs.

[2] https://www.driveclean.ca.gov/pev/Charging.php.

[3] EMFAC 2021. Statewide EV population. (EMFAC 2021 does not account for statewide targets under EO N-79-20).

[4] CEC 2023. Implementation of AB 2127 Electric Vehicle Charging Infrastructure Assessments. https://www.energy.ca.gov/publications/2023/second-assembly-bill-ab-2127-electric-vehicle-charging-infrastructure-assessment.

[5] Ratio assumed to be maintained in the future.

[6] CEC's study only goes to 2035. Charger estimates after 2035 are based on 2035 ratios.

[7] See Page 6 of CEC's study.

[8] Assumes there are currently no chargers available for medium and heavy duty Evs.

[9] 2045 Charger calculations are based on 2030 EV:Charger ratios modeled by CEC.

[9] Table D-9: Statewide annual charger totals 2033-2035 AATE3

Charger and location	2030	2035
Single-family housing L1	1,373,064	2,328,896
Single-family housing L2	2,728,362	5,717,384
Multi-family housing L1	121,975	196,388
Multi-family housing L2	191,346	380,628
Shared Private Office	206,123	293,692
Public Office	85,885	195,795
Shared Private Retail	34,354	129,225
Public Retail	139,146	323,516
Shared Private Other	47,237	164,468
Public Other	143,440	347,011
DCFC 150 or less	4,268	4,910
DCFC 250	10,731	21,462
DCFC 350	17,832	46,396
public and shared private only	401,302	939,090

Source: https://www.energy.ca.gov/publications/2023/second-assembly-bill-ab-2127-electric-vehicle-charging-infrastructure-assessment.

TR-3.1

Require all construction projects starting in 2025 and later to use renewable diesel in diesel-powered construction equipment.

	2021	2030	2045
Construction equipment emissions with Conventional Diesel (MTCO2e)	9,033	12,023	16,701
Target Renewable Diesel usage rate for construction equipment		100%	100%
Percent Reduction in Carbon Intensity of Renewable Diesel Compared to Conventional Diesel [1]	65%		
Construction equipment emissions with Renewable Diesel (MTCO2e)	3,162	4,208	5,846
Percent of Zero Emission Equipment by Technology *			
Electric		0%	0%
Hydrogen		0%	0%
Renewable Diesel		100%	100%
Reduced GHG Emissions (MTCO2e)		**7,815**	**10,856**

Notes: ACF does not apply to construction vehicles and only applies to on-road fleets.

Sources:

[1] DOE. 2024. Renewable Diesel. https://afdc.energy.gov/fuels/renewable-diesel. Assume tailpipe emissions are the same between diesel and renewable diesel as they are chemically similar.

Available: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/froa-1.pdf.

TR-3.3

Provide vouchers to business owners (e.g., landscaping businesses) to convert or replace their gasoline-powered gardening equipment, such as lawnmowers, leaf blowers, and hedge trimmers, with electric or other zero-emission alternative equipment. Work with waste collectors and SMAQMD to ensure proper disposal and/or reuse of gasoline-powered landscaping equipment.

Reduce emissions from landscaping equipment such as leaf blowers by supporting a transition to zero-emission equipment. Program assumed to start in 2026.	2021	2030	2035	2040	2045
Forecasted Landscaping Equipment Population in Sacramento County	918,355	1,049,652	1,089,194	1,124,456	1,160,025
CARB Modeled Population Trend of Landscaping Equipment before MY2024 for Sacramento County [7]		330,190	102,643	27,063	4,836
Percent of Equipment that are older than MY2024	100%	31.5%	9.4%	2.4%	0.4%
Forecasted Landscaping Equipment Population in Elk Grove	106,282	143,229	158,704	173,420	188,031
Landscaping Population Eligible for Replacement Program		45,056	14,956	4,174	784
Existing Emissions per Equipment (gCO2e/year)	26,505				
Existing Landscaping Equipment					
Average Voucher Cost per Equipment Replaced/Recycled [6]	$75				
Total Funding Available for Program	$2,000,000				

Emissions Reductions based on Assumed Annual Funding

Year	Annual Funding Available [1]	Assumed Participation Rate	Forecasted Population of Eligible Equipment	Number of Equipment Replaced per year	Percent of Forecasted Existing Population Replaced	Annual Emissions Reductions (MTCO2e)
2021	$425,127	100%	106,282	5,668	5%	150
2022	$397,916	100%	99,479	5,306	5%	141
2023	$370,704	100%	92,676	4,943	5%	131
2024	$343,493	100%	85,873	4,580	5%	121
2025	$316,281	100%	79,070	4,217	5%	112
2026	$289,069	100%	72,267	3,854	5%	102
2027	$261,858	100%	65,464	3,491	5%	93
2028	$234,646	100%	58,662	3,129	5%	83
2029	$207,435	100%	51,859	2,766	5%	73
2030	$180,223	100%	45,056	2,403	5%	64
2031	$156,143	100%	39,036	2,082	5%	55
2032	$132,063	100%	33,016	1,761	5%	47
2033	$107,983	100%	26,996	1,440	5%	38
2034	$83,903	100%	20,976	1,119	5%	30
2035	$59,824	100%	14,956	798	5%	21
2036		100%	12,799	—	0%	—
2037		100%	10,643	—	0%	—
2038		100%	8,487	—	0%	—
2039		100%	6,330	—	0%	—
2040		100%	4,174	—	0%	—
2041		100%	3,496	—	0%	—

Year	Annual Funding Available [1]	Assumed Participation Rate	Forecasted Population of Eligible Equipment	Number of Equipment Replaced per year	Percent of Forecasted Existing Population Replaced	Annual Emissions Reductions (MTCO2e)
2042		100%	2,818	—	0%	—
2043		100%	2,140	—	0%	—
2044		100%	1,462	—	0%	—
2045		100%	784	—	0%	—
Cumulative Total	**$3,566,669**			**47,556**		**1,260**

		2030	2045
GHG reductions from zero-emission landscaping equipment from replacing existing equipment (MTCO2e)		**64**	**—**
New Landscaping Equipment (SORE not accounted for in forecast)			
Forecasted Landscaping Equipment Emissions in Elk Grove (MTCO2e)	2,817	3,602	4,833
Landscaping equipment emissions from existing equipment (MTCO2e) [1]		1,133	20
Forecasted New Landscaping equipment emissions (MTCO2e)		2,469	4,813
Target electrification rate under SORE AB 1346 [3]		*67%*	*99%*
Reduction in landscaping equipment emissions from SORE regulations (MTCO2e)		1,664	4,767
GHG reductions from zero-emission landscaping equipment from new equipment (MTCO2e)		**1,664**	**4,767**
Additional emissions from electricity use			
Gasoline Emission Factors (MTCO2e per gal)		0.00810	0.00810
Reduced Gasoline usage due to transition (gal)		205,474	588,809
kWh per gal conversion [4]	0.03		
Electricity required to charge transitioned construction equipment (kwh)		2,894	8,293
Charged amount (MWh)		2.89	8.29
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		0.18752	0.00000
Additional GHG emissions from zero-emission construction equipment (MTCO2e)		**1**	**—**
Reduced GHG Emissions (MTCO2e)		**1,727**	**4,767**
Total Net Emissions from Reduced Electricity Use (MTCO2e)		(1)	—

Sources:

[1] Declining amount based on declining pop of existing equip.

[3] Calculated from CARB's SORE 2020 Model assuming all small offroad lawn equipment are zero emissions starting in Model Year 2024.

[4] Convertunits.com.

[5] https://www.nrdc.org/bio/madhur-boloor/electric-vehicle-basics#:~:text=Electric%20motors%20convert%20over%2085,for%20a%20gas%20combustion%20engine.

[6] Based on vouchers used in Salt Lake City's Landscaping Equipment Exchange program (https://www.slc.gov/sustainability/landscaping/).

[7] Modeled in CARB's SORE2020 Model.

Calculations for estimating effective efficiency of transition of landscaping equipment from gasoline to electric

Assumed average efficiency of gasoline engines (conservative) [5]	40%
Assumed average efficiency of electric motors [5]	85%
Number of kBTU of electricity needed to produce the same amount of work as one kBTU of gasoline in a motor	0.47

RC-1

Increase Organic Waste Diversion

	2021	2030	2045
Solid waste emissions (MTCO2e)		26,034	36,165
Statewide Diversion Rate [1]	46%		
Statewide Disposal Rate per Day (pounds per person per day) [1]	6.4		
Elk Grove Disposal Rate per Day (pounds per person per day) [2]	2.9		
Elk Grove Waste Diversion Targets [3]	76%	*80%*	*95%*
Increased waste diversion		4%	19%
Adjusted forecasted emissions from solid waste (MTCO2e)		21,280	7,390
Reduced GHG Emissions (MTCO2e)		**4,755**	**28,775**

Notes: From CalRecycle 2021: CalRecycle estimates that California's overall waste generation in 2021 was about 76.7 million tons. Of that total waste generation, 46 million tons went to disposal and disposal-related activities, including about 41.5 million tons sent to landfill.

Sources:

[1] Diversion rate = 1 - Disposal rate. State of Disposal and Recycling for Calendar Year 2021. CalRecycle 2022. Available: https://www2.calrecycle.ca.gov/Publications/Download/1890.

[2] CalRecycle Jurisdiction Diversion/Disposal Rate Summary (2007 - Current) - Elk Grove. Available: https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006.

[3] 2021 values calculated by scaling the Elk Grove rate by the disposal rates between Statewide and Elk Grove in 2021.

RA-4.3

Establish a program to assist and incentivize residential and nonresidential building owners in retrofitting existing buildings with cool roofs or green roofs, underscoring the array of co-benefits they have to offer aside from mitigating the urban heat island effect, such as reduced energy costs. As part of the program, consider developing guidelines and linking to an array of external resources for proper maintenance and responsible disposal.

	2021	2030	2045
Radiant Barrier (when re-roofing) - Applicable to Existing Single-Family Homes only [1]			
Cool Roof (when re-roofing) - Applicable to Existing Multi Family Homes only			
Both Scenarios Modeled Together in LocalEnergyCodes.com			
Start Year	2026		
Program duration (years) [2]	20		
Average Lifespan of Roof (years)	25		
Percentage of units replaced per year (Penetration Rate)	4%		
Installation Time (years)	1		
Applicability Rate (Percent of eligible homes that will actually install the required measure.) (default)	50%		
Number of Housing Units in Elk Grove		61,096	81,984
Number of Existing Housing Units in Elk Grove			
Number of Affected Units per year (as modeled in LocalEnergyCodes.com) (Single- and Multi-Family)		767	646
Percent of total households		1%	1%
Total Annual Gas Savings (Therms) [3]		22,298	57,943
Annual Savings per Home (therms/unit)		29	152
Natural gas emissions factor (MTCO2e/therm)		0.00532	0.00532
Emissions Reductions from Natural Gas Savings (MTCO2e)		**119**	**308**
Total Annual Electricity Savings (kWh) [3]		605,941	1,520,000
Annual Savings per Home (kWh/unit)		790	2354
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		1.88E-01	0.00E+00
Emissions Reductions from Electricity Savings (MTCO2e)		**114**	**0**
Net GHG Reductions (MTCO2e)		**232**	**308**
Total Net Emissions from Reduced Electricity Use (MTCO2e)		**114**	**—**

Notes.

[1] For re-roof improvements on existing single-family homes only, LocalEnergyCodes.com finds that radiant barriers are cost effective and cool roofing products (e.g., shingles with high irradiance) are not.

[2] Cool roofs were not required until after 2001 in new construction. Thus, over the next 20 years, it is likely that existing homes built before 2001 would have a roof replacement or re-roof. Although roofs last around 25 years, a shorter duration was assumed to account for limited long-term funding.

Sources:

[3] Based on Modeling in LocalEnergyCodes.com.

[4] Based on results from BE-5, but adjusted for applicability rate.

RA-5

Expand the Urban Tree Canopy

Increasing Tree Canopy Coverage in the Rural Area	2021	2030	2045
2018-2022 Tree Canopy Cover Percent [1]	13%		
2018-2022 Tree Canopy Cover Area (km^2) [1]	14		
Estimated Number of Trees (Best available data is for 2007)	111,924		
Trees per square kilometer	7,995		
Tree Canopy Coverage Area in Rural Area (km^2)[2]	2.86		
Estimated number of Trees in Rural Areas	22,864		
Annual sequestration rate per new tree (MTCO2) [2]		0.049	0.049
Target: Number of net new trees planted each year		*953*	*953*
Number of years since planting begins in 2026		4	19
Number of trees planted over period in active growing stage in inventory year		3,811	18,101
Percent of Existing Rural Trees		17%	79%
Reduced GHG Emissions (MTCO2e)		**185**	**880**

Sources:

[1] Google EIE. Data collected by Google between 2018 and 2022. No data available for 2007.

[2] Census Tracts 06067009336 (16%) and 06067009652 (1%).

[2] i-Tree Planting tool run for the distribution of species noted in Elk Grove's Urban Forest Canopy Assessment. https://www.elkgrovecity.org/sites/default/files/city-files/Departments/Planning/UrbanCanopyAssessment.pdf.

Elk Grove i-Tree Assessment

Tree Species	Distribution Based on Urban Forest Canopy Assessment	CO2 Sequestered (kilograms) over 40 years for newly planted trees
London planetree (*Platanus x hybrida*)	6	7,930.50
California sycamore (*Platanus racemosa*)	5	2,600.60
Common crapemyrtle (*Lagerstroemia indica*)	9	10,713.60
Coast redwood (*Sequoia sempervirens*)	7	8,585.30
California white oak (*Quercus lobata*)	3	6,488.80
Sweetgum (*Liquidambar styraciflua*)	3	13,721.30
Hackberry spp (*Celtis*)	3	903.8
Oak spp (*Quercus*)	3	6,576.30
Pear spp (*Pyrus*)	3	3,669.70
Red maple (*Acer rubrum*)	3	12,636.40
Chinese pistache (*Pistacia chinensis*)	3	7,088.40
European white birch (*Betula pendula*)	3	13,068.60
Black tupelo (*Nyssa sylvatica*)	3	5,430.80
Japanese zelkova (*Zelkova serrata*)	3	3,147.70
Plum spp (*Prunus*)	3	4,806.90
Blue gum eucalyptus (*Eucalyptus globulus*)	3	17,326.20
Interior live oak (*Quercus wislizeni*)	3	3,631.90
Other (palms, conifers, camphor trees		
Total	66	128,326.80
Average Sequestration Per Year for a newly planted tree over 40 years (MTCO2e/tree/year)		0.048608636
Total Number of City Trees in Elk Grove in 2007 [1]	111,924	

Assumptions and Emission Factors

GWP Factors	Value	Comment			
CO2	1	Carbon Dioxide			included in CARB Inventory
CH4	27	Methane	Short Lived Climate Pollutant	AR6	included in CARB Inventory
N2O	273	Nitrous Oxide		AR6	included in CARB Inventory

Energy Emission Factors

	2030	2035	2040	2045	2050
Natural gas emissions factor (MTCO2e/therm)	0.0053	0.0053	0.0053	0.0053	0.0053
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD) (See Inventory and Forecast)	0.1875	0.0469	0.0234	0.0000	0.0000

Appendix D

Municipal Strategies and Actions

Memo

455 Capitol Mall, Suite 300
Sacramento, CA 95814
916.444.7301

Date: June 18, 2025

To: Christopher Jordan and Carrie Whitlock (City of Elk Grove)

From: John Steponick, Luis Montes, Brenda Hom, Hannah Kornfeld, and Honey Walters (Ascent)

Subject: City of Elk Grove Climate Compass: Final City Operations Strategies and Actions

1 INTRODUCTION

The City of Elk Grove (COEG) is preparing an update to its 2019 Climate Action Plan (CAP), hereinafter referred to as the "Climate Compass." The Climate Compass will address COEG operations, identify opportunities for greenhouse gas (GHG) emissions reduction, and improve climate resilience.

2 GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

COEG's GHG reduction targets and goals should be aligned with state plans and laws as follows:

- Reducing emissions to 48 percent below 1990 levels by 2030 (per the 2022 Scoping Plan), and
- Reducing emissions to 85 percent below 1990 levels by 2045 (per AB 1279).

COEG aims to reduce its GHG emissions in proportion to the state's plans and targets. COEG emissions levels from 1990 are not available, which is the case for most local jurisdictions in California. Thus, GHG reduction targets for COEG were developed relative to the 2021 COEG operations emissions inventory. Therefore, consistent with state plans and targets, and considering relevant emissions sectors, COEG's GHG reduction targets are as follows:

- 2030 target: 39 percent below 2021 levels (2,628 metric tons of carbon dioxide equivalent [$MTCO_2e$]), and
- 2045 target: 85 percent below 2021 levels (662 $MTCO_2e$).

Additional information regarding the methods used to set COEG's GHG reduction targets can be found in the technical memorandum titled "City of Elk Grove Climate Compass: Final Community Strategies and Actions," dated June 18, 2025.

3 STRATEGIES AND ACTIONS

The following section details the strategies, actions, Key Performance Indicators ("KPIs"), implementing departments, partnerships, and timeline for implementation under several categories:

- Buildings and Facilities
- Fleet and Employee Commute
- Solid Waste and Water
- Resilience

KPIs are identified that align with the anticipated GHG reduction for each strategy. Strategies include implementation actions that identify more specific programs, policies, and partnerships to achieve the objectives of the strategies. Actions also include COEG departments that would be responsible for implementing each action and, where applicable, partnerships with agencies have been identified. In the table that follows, COEG departments have been abbreviated as such:

City Department Abbreviations:

CD	Community Development
CM	City Manager's Office
FI	Finance
PW	Public Works

Agency/Organization Partner Abbreviations:

CCSD PR	Cosumnes Community Service District Parks and Recreation Department
EGWD	Elk Grove Water District
Republic	Republic Services
SacRT	Sacramento Regional Transit District
SMUD	Sacramento Municipal Utility District
SMAQMD	Sacramento Metropolitan Air Quality Management District

Additional GHG reductions are needed to achieve the COEG emissions reduction targets for 2030 and 2045 beyond those realized from state and federal legislative actions.

GHG reductions associated with the strategies included in this technical memorandum were calculated in a stepwise manner for the future years 2030 and 2045. In other words, GHG reductions (in MTCO2e) are assessed during a snapshot in time in the years 2030 and 2045. Strategies are quantified for a single year rather than adding cumulative reductions from prior years, which aligns with the methodology used to derive COEG's GHG reduction targets. Importantly, GHG emissions reductions were quantified for strategies wherever substantial evidence and reasonable assumptions were available to support calculations. COEG staff and Ascent also identified strategies that were not quantifiable because of a lack of available data or quantification methods but would still be expected to reduce GHG emissions. These strategies are listed in this technical memorandum and will be discussed qualitatively in the Climate Compass. They can be monitored for potential quantification opportunities in the future if data and/or quantification methods become available.

Estimates of GHG emissions reductions, along with an estimated emissions "gap" (i.e., the difference between GHG reductions required to meet the targets and total estimated GHG reductions), are summarized in Table 1 below. Descriptions of the strategies are provided in the following section. Detailed strategy calculations and assumptions supporting the GHG reduction estimates are provided in Attachment A.

Table 1 City of Elk Grove Operations Gap Analysis Summary

Strategy Number	Category	Strategy	GHG Reductions ($MTCO_2e$) 2030	GHG Reductions ($MTCO_2e$) 2045
BF-1	Buildings and Facilities	Electrify and Decarbonize COEG Buildings and Facilities	262	1,588
BF-2		Increase Renewable Energy Use and Storage	1,762	0
BF-3		Reduce Energy Consumption	N/A	N/A
FEC-1	Fleet and Employee Commute	Reduce COEG Employee VMT	87	45
FEC-2		Shift to Clean On-Road and Off-Road Vehicles and Equipment	369	722
RS-1	Resilience	Protect COEG's Assets and Utilize COEG Facilities to Protect the Community from Climate Hazards	N/A	N/A
WW-1	Solid Waste and Water	Reduce Water Use	1	0
WW-2		Practice Sustainable Waste Management	20	94
		Total Reductions from Strategies	**2,501**	**2,450**
		Reduction Needed to Meet Target	1,923	2,070
		Target Met?	Yes	Yes
		Remaining Gap to Target	(578)	(380)

Notes: Total may not sum exactly due to independent rounding. COEG = City of Elk Grove; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; N/A = not applicable; VMT = vehicle miles traveled; ZEV = zero-emission vehicle.

Parentheses indicate target was met with a surplus of reductions.

Source: Calculations conducted by Ascent in 2025.

Category, Strategy, Action(s)	Implementing Dept(s)	Partner(s)	2030 GHG Reduction (MTCO2e)	2045 GHG Reduction (MTCO2e)	Timeline
Buildings and Facilities (BF)					
Strategy BF-1: Electrify and Decarbonize COEG Buildings and Facilities **Key Indicators/Targets:** **2030:** ▶ Existing buildings: 20% retrofitted to be fully electric. 10% of diesel generators replaced with carbon-free backup power supplies. ▶ New buildings: 100% fully electrified. 100% of backup power carbon-free. **2045:** ▶ Existing buildings: 100% retrofitted to be fully electric. 100% of diesel generators replaced with carbon-free backup power supplies. ▶ New buildings: 100% fully electrified. 100% of backup power carbon-free.			262	1,588	See actions below
Action BF-1.1: Adopt a policy that requires all new COEG buildings to be all-electric starting in 2026, and additionally, that requires existing buildings purchased by COEG to be fully electrified with remodeling/upgrades.	CM, PW	N/A	N/A	N/A	Near Term
Action BF-1.2: Develop and implement a roadmap outlining the necessary steps and timeline for electrifying all existing COEG buildings and facilities, including a detailed inventory of current building systems, and a prioritized list of buildings for electrification based on factors such as age of equipment, energy use intensity, and necessary electrification measures. The roadmap should also include cost estimates, potential funding sources, and projected energy savings and GHG emissions reductions for each project.	PW, CM	N/A	N/A	N/A	Near Term
Action BF-1.3: Conduct a feasibility study and cost analysis of replacing the natural-gas-powered pool heating system at the Aquatics Center with an electric or other zero-emission heating system (or other non-carbon-based system), and based on findings, implement the replacement as soon as feasibly possible.	CM, PW	CCSD PR	N/A	N/A	Near Term
Strategy BF-2: Increase Renewable Energy Use and Storage **2030:** ▶ 100% of electric grid that is carbon-free ▶ MW battery capacity installed ▶ kW renewable energy installed			1,762	0	See actions below
Action BF-2.1: In coordination with SMUD, ensure that electricity used at COEG buildings and facilities, along with electricity used for streetlights and traffic lights, is sourced from renewable sources to the maximum extent possible.	CM, PW	SMUD	N/A	N/A	Ongoing
Action BF-2.2: Continue to install solar and battery storage systems on suitable COEG buildings and facilities, prioritizing installations based on solar potential, historic energy consumption, roof condition, available site area, and potential cost savings.	PW, CM	SMUD	N/A	N/A	Ongoing
Action BF-2.3: Procure renewable diesel for use in all diesel-powered generators by 2030 and transition to carbon-free backup power supplies by 2045.	PW, CM	SMUD	N/A	N/A	Ongoing
Strategy BF-3: Reduce Energy Consumption General objective: Decreased energy use			Included in BF-1 and BF-2		See actions below
Action BF-3.1: Develop and adopt a green building policy requiring all new COEG buildings to meet CALGreen Tier 1 standards, establishing requirements for energy-efficient design, renewable energy integration, water conservation, and sustainable materials use.	CM, CD, PW	N/A	N/A	N/A	Near Term

Category, Strategy, Action(s)	Implementing Dept(s)	Partner(s)	2030 GHG Reduction (MTCO2e)	2045 GHG Reduction (MTCO2e)	Timeline
Action BF-3.2: Install a building energy management system (BEMS) in all new COEG buildings and facilities that provides real-time monitoring and control of energy usage, allowing for optimization of heating, cooling, and lighting systems. Each BEMS will include smart sensors, automated controls, and data analytics capabilities to identify energy-saving opportunities. Phasing should start with the largest energy-consuming buildings and facilities and gradually expand to all facilities. Include required training and technical support to properly use each system.	PW, CM	N/A	N/A	N/A	Midterm
Action BF-3.3: Conduct an audit of HVAC systems in all existing COEG buildings and develop a schedule to replace outdated systems with high-efficiency models, including features like variable refrigerant flow (VRF) systems and appropriately placed smart thermostats, and implementing regular maintenance to ensure optimal performance.	PW	N/A	N/A	N/A	Near Term
Action BF-3.4: Establish a retro-commissioning program for all existing COEG buildings, which encompasses a systematic process to identify and implement operational and maintenance improvements, and aims to optimize building systems, reduce energy consumption, improve occupant comfort, and extend equipment life.	PW	N/A	N/A	N/A	Midterm
Fleet and Employee Commute (FEC)					
Strategy FEC-1: Reduce COEG Employee Commute VMT **2030:** ▶ 11% reduction in commute VMT per employee **2045:** ▶ 23% reduction in commute VMT per employee			87	45	See actions below
Action FEC-1.1: Conduct regular COEG employee commute surveys (i.e., every 2-3 years) to understand commute patterns and quantify associated trips and VMT and to incorporate findings into future GHG inventory updates.	CM	N/A	N/A	N/A	Ongoing
Action FEC-1.2: Develop an employee carpool matching system that is integrated into COEG's intranet, which would allow employees to input their commute details and preferences and match them with suitable carpool partners. Provide incentives for regular use of the system, including COEG merchandise, or small quarterly stipends.	CM	N/A	N/A	N/A	Near Term
Action FEC-1.3: Partner with SacRT to establish a program offering monthly public transit passes to COEG employees.	CM	SacRT	N/A	N/A	Near Term
Action FEC-1.4: Establish a guaranteed ride home program that provides rides for COEG employees in the form of vouchers for rideshare or taxi services up to a certain number of times per year. The program would be intended for employees who use more sustainable transportation modes for their commute, such as public transit, carpooling, biking, or walking, and would prevent employees from being stranded in the event of public transit schedule changes, damage to their bicycle, or other unexpected situations.	CM	N/A	N/A	N/A	Near Term
Action FEC-1.5: Conduct a review of COEG buildings and facilities to identify opportunities to increase amenities that encourage biking, such as bicycle parking/storage, shelters, end-of-trip facilities (e.g., repair stands, bicycle wash stations, showers, locker rooms), and electric bicycle charging infrastructure.	CM, PW	N/A	N/A	N/A	Near Term
Action FEC-1.6: Launch an annual VMT reduction challenge for COEG employees, which would encourage departments or teams to compete in reducing their collective VMT over a set period each year by offering prize incentives for the winning team(s).	CM	N/A	N/A	N/A	Near Term
Action FEC-1.7: Establish an e-bike lending library for COEG employees to use as an alternative to vehicle use for intracity travel during work hours.	CM, FI	N/A	N/A	N/A	Near Term

Category, Strategy, Action(s)	Implementing Dept(s)	Partner(s)	2030 GHG Reduction (MTCO2e)	2045 GHG Reduction (MTCO2e)	Timeline
Action FEC-1.8: Develop and implement an incentive program for COEG employees who purchase a bike/e-bike for their commute (e.g., walking, biking). Incentives may include COEG merchandise, reimbursement up to a specified amount for the purchase of a bike/e-bike, or other benefits that are correlated with the number of days commuted using active transportation modes.	CM	N/A	N/A	N/A	Near Term
Strategy FEC-2: Shift to Clean On-Road and Off-Road Vehicles and Equipment **2030:** ▶ 38 charging stations at COEG facilities ▶ 20% of on-road vehicle fleet electric ▶ 25% of employee commute vehicles are EV/PHEV **2045:** ▶ 92 charging stations at COEG facilities ▶ 100% of on-road vehicle fleet electric ▶ 97% of employee commute vehicles are EV/PHEV			369	722	See actions below
Action FEC-2.1: Continue to implement the *Infrastructure Plan for Fleet Electrification* (and future updates) to transition COEG's vehicle fleet to ZEVs (mostly EVs) and to continue scaling up and providing ongoing maintenance for the infrastructure required to support an all-electric COEG fleet, including the deployment of EV charging stations at appropriate locations.	CM, PW	SMUD	N/A	N/A	Ongoing
Action FEC-2.2: Develop a policy to require greater use of low- and zero-emission off-road vehicles and encourage electric equipment (e.g., landscaping, construction) for City-owned equipment, City-funded projects, and City contractors.	PW	SMAQMD, CCSD PR	N/A	N/A	Midterm
Resilience (RS)					
Strategy RS-1: Protect COEG's Assets and Utilize COEG Facilities to Protect the Community from Climate Hazards General objective: Increased heat-mitigation activities			N/A	N/A	See action below
Action RS-1.1: Conduct an updated, comprehensive climate change vulnerability assessment specific to COEG's physical assets (e.g., buildings, facilities) and planned Capital Improvement Program projects, and based on findings, develop a prioritized list of COEG assets requiring climate adaptation interventions.	PW	N/A	N/A	N/A	Near Term
Action RS-1.2: Develop a policy that establishes heat-resilient building standards for all new COEG construction and major renovations, which addresses aspects such as green/cool roofs, enhanced insulation, and passive cooling design elements.	PW, CM	N/A	N/A	N/A	Midterm
Action RS-1.3: Retrofit existing COEG buildings and facilities to improve their resilience to climate hazards, such as extreme heat and extreme precipitation. Determine and implement solutions that are tailored and feasible for each building or facility (e.g., floodproofing measures may include elevation of critical systems, installing flood barriers, incorporation of flood-resistant materials).	PW	N/A	N/A	N/A	Midterm
Action RS-1.4: Develop a policy mandating the consideration of future climate projections in Capital Improvement Program projects that includes a checklist of resilience measures to be considered for different types of projects (e.g., buildings, roads, parks).	CM, PW	N/A	N/A	N/A	Near Term

Category, Strategy, Action(s)	Implementing Dept(s)	Partner(s)	2030 GHG Reduction (MTCO2e)	2045 GHG Reduction (MTCO2e)	Timeline
Action RS-1.5: Install cooling strategies and/or permeable pavement on COEG parking lots to help reduce the urban heat island effect and provide additional flood protection, prioritizing permeable pavement in lots or areas that are more flood prone. Test different types of cool and permeable pavement materials, and based on results, develop guidelines for broader implementation throughout the city.	PW	SMAQMD	N/A	N/A	Midterm
Action RS-1.6: Plant shade trees and add other heat-mitigating amenities around COEG buildings and facilities, such as reflective pathway surfaces, more shaded seating areas, hydration stations, and misters, among other amenities.	PW	N/A	N/A	N/A	Near Term
Action RS-1.7: Implement rigorous preventive maintenance schedules for all COEG infrastructure to enhance their longevity, bolster their resilience, and reduce the need for new materials (i.e., for premature repairs and replacement).	PW	N/A	N/A	N/A	Midterm
Solid Waste and Water (WW)					
Strategy WW-1: Reduce Water Use **2030:** ▶ 10% reduction in outdoor water use below 2021 levels ▶ 10% reduction in indoor water use below 2021 levels **2045:** ▶ 30% reduction in outdoor water use below 2021 levels ▶ 20% reduction in indoor water use below 2021 levels			1	0	See actions below
Action WW-1.1: Develop and implement a plan to gradually replace water-intensive landscaping (e.g., turfgrass that is not intended for recreational use) at COEG and CCSD-managed facilities and parks with native, drought-tolerant plants and/or permeable hardscaping, which should include a phased and prioritized implementation schedule. As part of plan implementation, update COEG's landscape guidelines to reflect appropriate planting and maintenance guidance for drought-tolerant landscaping.	PW	CCSD PR	N/A	N/A	Near Term
Action WW-1.2: Upgrade all COEG- and CCSD-managed irrigation systems to smart, weather-based systems that use real-time weather data and soil moisture sensors to optimize watering schedules and reduce overwatering, and additionally, develop a maintenance and monitoring program to ensure long-term efficiency.	PW	CCSD PR	N/A	N/A	Long Term
Action WW-1.3: Conduct periodic water use audits for all COEG buildings and facilities, which will help to identify leaks, inefficient fixtures, and opportunities for water reuse. Based on annual audit results, develop a list of water-saving upgrades and needed operational changes.	PW	N/A	N/A	N/A	Midterm
Strategy WW-2: Practice Sustainable Waste Management General objective: Increase waste diversion			20	94	See actions below
Action WW-2.1: Conduct a review of existing COEG procurement and operational practices and adopt practices that further avoid the generation of waste, such as using reusable materials, compostable products, and reduced packaging. Additionally, develop training for COEG employees on sustainable purchasing, procurement, and operations to maximize avoidance of waste generation, and conduct periodic waste audits to measure the success of existing efforts and inform potential changes to policies or procedures, as necessary.	FI, PW	N/A	N/A	N/A	Midterm

Category, Strategy, Action(s)	Implementing Dept(s)	Partner(s)	2030 GHG Reduction (MTCO2e)	2045 GHG Reduction (MTCO2e)	Timeline
Action WW-2.2: Increase recycling and organic waste diversion at all COEG buildings and facilities by inventorying and identifying needs for additional recycling and food waste bins and appropriate signage and education opportunities (e.g., regular staff presentations, mini workshops) to inform/educate employees and the public on proper waste disposal and recycling.	PW	Republic	N/A	N/A	Near Term
Action WW-2.3: Institutionalize a sustainable events policy that requires zero waste at events hosted by COEG.	CM, PW	N/A	N/A	N/A	Near Term
Action WW-2.4: Adopt a policy that requires minimum recycled content in construction materials for COEG construction and maintenance projects, and additionally, includes the development of a preferred materials list. Regularly update the policy to reflect advancements in recycled material technology and availability.	PW, CM, CD	N/A	N/A	N/A	Midterm
TOTAL GHG EMISSION REDUCTIONS			**2,501**	**2,450**	
TARGET GHG EMISSION REDUCTIONS			**1,923**	**2,070**	

ATTACHMENT A

Summary

City of Elk Grove City Operations

GHG Strategy Quantification Summary

Category	Strategy Number	Strategy	2030	2045	Quantification approach
Buildings and Facilities	BF-1	Electrify and Decarbonize City Buildings and Facilities	262	1,588	Existing buildings (constructed before 2026): 50% retrofitted to all-electric by 2030, 100% by 2045. New buildings (constructed after 2026): all electric
	BF-2	Increase Renewable Energy Use and Storage	1,762	—	All SMUD-provided electricity is 100% carbon-free by 2030.
Fleet and Employee Commute	FEC-1	Reduce City Employee Vehicle Miles Traveled	87	45	11% reduction in employee commute VMT from trip reduction programs by 2030, 23% by 2045.
	FEC-2	Shift to Clean On-Road and Off-Road Vehicles and Equipment	369	722	25% of employee commute vehicles are EV/PHEV by 2030, 97% by 2045. 83% of COEG fleet is EV by 2030, 100% by 2045.
Solid Waste and Water	WW-1	Reduce Water Use	1	—	Outdoor water: 10% reduction in water use by 2030, 30% by 2045. Indoor water: 10% reduction in water use by 2030, 20% by 2045.
	WW-2	Practice Sustainable Waste Management	20	94	65% diversion target achieved by 2030, 80% by 2045.
Total emissions reductions from strategies			**2,501**	**2,450**	
Legislative-Adjusted Business-As-Usual Emissions			**4,550**	**2,732**	
Target Emissions			**2,628**	**662**	
Reductions Needed to Meet Targets			**1,923**	**2,070**	
Emissions with Strategies			**2,049**	**283**	
Emissions Gap			**-578**	**-380**	
Target Met?			**Yes**	**Yes**	

Targets

Target Setting for City of Elk Grove

City of Elk Grove Target Emissions and Target Percent Reduction from 2021 Emissions Levels

Year	City Target Emissions	Target Percent Reduction from 2021	Leg-Adjusted BAU	Difference from Leg-Adj BAU
2021	4,275			
2030	2,628	39%	4,550	1,923
2045	662	85%	2,732	2,070

CARB Scoping Plan Emissions Targets by Sector

Sectors	CARB's Statewide GHG Inventory 2021	2022 Scoping Plan Scenario 2030	2022 Scoping Plan Scenario 2035	2022 Scoping Plan Scenario 2040	2022 Scoping Plan Scenario 2045	Not included in Scoping Plan. Assumed to be equal to 2045. 2050
Agriculture	31	20	18	17	15	15
Residential and Commercial	39	27	18	10	4	4
Electric Power	62	39	31	28	9	9
High GWP	21	10	10	10	9	9
Industrial	74	41	29	19	12	12
Recycling and Waste	8	9	9	8	8	8
Transportation	146	81	53	27	8	8
CDR	0	-7	-35	-63	-75	-75
Total	**381**	220	133	55	-10	-10
Adjusted Total (include applicable sectors only)	**286**	**176**	**129**	**89**	**44**	**44**

Sources: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-PATHWAYS-data-E3.xlsx.

CARB 2022. California Greenhouse Gas Inventory for 2000-2020 — by Category as Defined in the 2008 Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/ghg_inventory_scopingplan_sum_2000-20.pdf.

Applicable Emission Sectors

Emission Sectors	Applicable to City of Elk Grove?
Agriculture	yes
Residential and Commercial	Yes
Electric Power	Yes
High GWP	No
Industrial	No
Recycling and Waste	Yes
Transportation	Yes
CDR	No

GHG Reduction Targets

Milestone Year	All Sectors		Selected Sectors	
	Statewide Existing and Target Emissions (MMTCO2e)	Target Percent Reduction from 2021	Statewide Existing and Target Emissions (MMTCO2e)	Target Percent Reduction from 2021
2021	381	NA	286	
2030	220	42%	176	39%
2035	133	65%	129	55%
2040	55	86%	89	69%
2045	(10)	103%	44	85%
2050	(10)	103%	44	85%

CARB Statewide Inventory Applicable Sector Determination by Scoping Plan Categorization

Emissions Sector	Emissions Subsector	Applicable to Elk Grove?	Sector Included in Target Setting?
Agriculture	Livestock	No	No
	Crop Growing and Harvesting	No	
	General Fuel Use	No	
Commercial and Residential	Residential Fuel Use	Yes	Yes
	Commercial Fuel Use	Yes	
	Commercial Co-Generation Heat Output	Yes	
	Other Commercial and Residential	Yes	
Electric Power	In-State Generation	Yes	Yes
	Imported Electricity	Yes	
High-GWP	Ozone depleting substance substitutes	No	No
	Electricity Grid SF6 Losses	No	
	Semiconductor Manufacturing	No	
Industrial	Cement Plants	No	No
	Co-Generation Heat Output	No	
	General Fuel Use	Yes	
	Off Road	Yes	
	Oil & Gas: Production and Processing	No	
	Other Fugitive and Process Emissions	Yes	
	Refineries and Hydrogen Production	No	
Recycling and Waste	Landfills	Yes	Yes
	Composting	Yes	
Transportation	Aviation	No	Yes
	Not Specified	Yes	
	On Road	Yes	
	Rail	No	
	Ships and Commercial Boats	No	

BF-1

Electrify and Decarbonize City Buildings and Facilities

	2021	2026	2030	2045
City-owned buildings built after 2026 are all-electric				
Natural gas usage (therms)	173,627	204,794	229,728	297,883
Natural gas savings from all-electric new development after 2026 (therms)			24,934	93,089
Natural gas emissions factor (MTCO2e/therm)			0.0053218	0.0053218
GHG reductions from natural gas savings in new development (MTCO2e)			133	495
Diesel backup generator usage (gallons)	181	213	239	310
Diesel savings from all-electric new development after 2030 (gallons)			26	97
Diesel backup generator emissions factor (MTCO2e/gallon)			0.0103363	0.0103363
GHG reductions from diesel savings in new development (MTCO2e)			0.3	1.0
GHG reductions from all-electric new development in 2030 (MTCO2e)			**133**	**496**
All-electric retrofits for existing buildings by 2045				
Existing natural gas usage (therms)			204,794	204,794
Percent of buildings retrofitted from natural gas			20%	100%
Existing diesel backup generator usage (gallons)			213	213
Percent of buildings retrofitted from diesel backup generators			10%	100%
Reduced natural gas (therms)			40,959	204,794
Reduced diesel backup generator usage (gallons)			21	213
Natural gas emissions factor (MTCO2e/therm)			0.0053218	0.0053218
Diesel backup generator emissions factor (MTCO2e/gallon)			0.0103363	0.0103363
GHG reductions from all-electric retrofits by 2045 (MTCO2e)			**218**	**1,092**
Additional electricity use and emissions				
Assumed average efficiency of natural gas heating (conservative) [1]	80%			
Assumed average efficiency of air source electric heat pumps [2]	325%			
kWh per therm conversion	29.3001			
Total therms offset from natural gas heating use (therms)			65,893	297,883
Total electricity needed to offset natural gas heating (MWh)			475	2,148
SMUD electricity emissions factor (MTCO2e/MWh)			0.18753	0
Additional GHG emissions from electricity use (MTCO2e)			**89**	**—**
GHG Reductions from BF-1 (MTCO2e)			**262**	**1,588**

Sources:

[1] U.S. DOE 2024. Furnaces and Boilers. Available: https://www.energy.gov/energysaver/furnaces-and-boilers.

[2] Light Commercial HVAC Equipment Key Product Criteria. Table 2: Criteria for ENERGY STAR Qualified Light Commercial Heat Pumps. Available: https://www.energystar.gov/products/light_comm_heating_cooling/key_product_criteria.

BF-2

Increase Renewable Energy Use and Storage

	2021	2030	2045
Support SMUD's 2030 Zero-Carbon Plan			
Forecasted emissions from electricity consumption from buildings and facilities (MTCO2e)		829	—
Additional emissions from electrifying and decarbonizing buildings (Strategy BF-1 implementation)		89	—
Additional emissions from streetlights and traffic signals after conversion to LED (Strategy BF-3)		820	—
Additional GHG emissions from EV on-road fleet (Strategy FEC-2)		25	—
Total Emissions (MTCO2e)		1,762	—
Emissions reduction after SMUD's 2030 Zero-Carbon Plan (MTCO2e)		**1,762**	—

FEC-1

Reduce City Employee Vehicle Miles Traveled

	2021	2030	2045
Annual employee commute VMT	2,319,909	3,069,503	3,980,157
Annual GHG emissions from employee commutes (MTCO2e)	835	769	201
Reduction in employee commute VMT after implementation of Strategy FEC-2		340,936	551,935
Reduced VMT from employee commute. after implementation of Strategy FEC-2		2,728,567	3,428,222
Percent reduction in employee commute emissions through trip reduction programs [1]		11%	23%
VMT Reduced under Strategy FEC-1		306,964	771,350
GHG reductions from employee commutes (MTCO2e)		87	45
GHG Reductions from FEC-1 (MTCO2e)		**87**	**45**

Source:

[1] The maximum emission reduction and VMT reduction possible from a combination of Trip Reduction Program is capped at 45%. The following actions can be a part of the Trip Reduction Program:

(i) Teleworking

(ii) Employee parking cash-out

(iii) Rideshare program

(iv) Discounted Transit program

(v) End-of-trip bicycle facilities

(vi) Employer sponsored vanpool

(vii) Trip Reduction Program marketing

Source: CAPCOA, 2021. Handbook for Analyzing GHG Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.

[2] http://www.fueleconomy.gov/feg/download.shtml (Without EV efficiency forecasts, EV efficiency assumed to be the same for all future years).

Vehicle Type	Number of employees using the vehicle type (out of total number of employees who responded to the survey)	Percentage of employees using the vehicle type (out of total number of employees who responded to the survey)
Passenger Car (Gas or Hybrid)	90	51%
Light Truck/SUV/Pickup/Van (Gas or Hybrid)	74	42%
Heavy Duty Truck (truck w/ 2 axles & 6 or more tires or a gross vehicle weight exceeding 10,000 lbs, example: Ford F250 or F350)	5	3%
Plug In Hybrid :)	1	1%
Fully Electric Vehicle	5	3%
Bike	3	2%
Total	**178**	**2%**

FEC-2a

Shift to Clean On-Road and Off-Road Vehicles and Equipment

Transition employee commute vehicles to zero-emission vehicles.	2021	2030	2045
City Employees	424	561	727
Sacramento County population	1,549,172	1,679,851	1,897,648
Population ratio (City Employees vs County Pop)	0.0003	0.0003	0.0004
Install EV charging stations at City buildings and facilities for LDVs and allow employees to use chargers without cost to employees			
EV Forecasts and Targets			
EMFAC2021 ACC II Light Duty Pop - Countywide [1]		1,050,265	1,177,543
EMFAC2021 ACC II Light Duty Pop - Elk Grove		351	451
EMFAC2021 ACC II Light Duty EV Pop - Countywide [1]		150,253	833,278
EMFAC2021 ACC II Light Duty EV Pop - Elk Grove		50	278
Calculated EMFAC2021 ACC II Light Duty EV percentage		14%	62%
Targeted EV/PHEV Pop percentage under FEC-2		25%	75%
Increased EV/PHEV Pop percentage under FEC-2		11%	13%
City Employees	424	561	727
Additional Employee EV Pop under FEC-2 beyond EMFAC		60	97
Additional GHG emissions from employee commute EVs			
Average annual commute miles per employee (mi/vehicle) [1]		5,683	5,683
New EV VMT under strategy		340,936	551,935
Average Efficiency of EV LDV (kWh/100-mi) [2]		38.60	38.60
Charged amount (kWh)		131,601	213,047
Charged amount (MWh)		132	213
Leg-Adjusted Electricity emissions factor (MTCO2e/MWh)(SMUD)		0.187529	0.00E+00
Additional GHG emissions from employee commute EVs (MTCO2e)		25	—
Emissions avoided from Equivalent Gasoline/Diesel employee commute vehicles			
Average emissions factor from future vehicles (gCO2e/mi) [1]		88	137
Average annual commute miles per employee (mi/vehicle) [1]		5,683	5,683
Reduced Leg-Adj BAU VMT (mi)		340,936	551,935
Reduced Leg-Adj emissions under FEC-2 (MTCO2e)		30	76
Total Emission Reductions from Increased LDV EV/PHEV Mix in employee commute (MTCO2e)		**5**	**76**
Net GHG emissions avoided from increased EV chargers at City buildings and facilities from Strategy FEC-2 (MTCO2e)		**5**	**76**

Sources:

[1] Based on employee commute data from City

[2] https://www.driveclean.ca.gov/pev/Charging.php.

FEC-2b

Shift to Clean On-Road and Off-Road Vehicles and Equipment

	2021	2030	2045
Annual Fleet VMT [1]	1,410,819	1,866,673	2,445,641
Annual VMT from Fleet using Combustion (gas/diesel) Engines		1,500,061	1,500,061
Annual VMT from EV Fleet		366,612	366,612
Combustion Percent of Total VMT		80%	80%
EV Percent of Total VMT [2] as Anticipated under ACC2		20%	20%
Annual GHG emissions from on-road vehicle fleet (MTCO2e)	**620**	**578**	**646**
VMT under COEG's Fleet Electrification Plan			
Combustion Percent of Total VMT		17%	0%
EV Percent of Total VMT		83%	100%
Combustion Fleet Emissions under Fleet Electrification Plan			
Annual VMT from Fleet using Combustion Engines		325,786	-
Average Combustion Fleet Vehicle Emission Factor (gCO2e/mi)		359.87	359.87
Combustion Fleet Emissions under Fleet Electrification Plan (MTCO2e)		117.24	0.00
EV Fleet Emissions under Fleet Electrification Plan			
Annual VMT from EV Fleet		1,540,887	2,445,641
Average Efficiency of EV LDV (kWh/100-mi) [3]		34	34
Electricity charged per year (MWh)		518	822
SMUD electricity emissions factor (MTCO2e/MWh)		0.18753	0.00000
EV Fleet Emissions under Fleet Electrification Plan (MTCO2e)		97.17193	0.00000
GHG emissions under COEG's Fleet Electrification Plan (MTCO2e)		**214**	—
Diesel off-road vehicles and equipment			
GHG Reductions from FEC-2b (MTCO2e)		**364**	**646**

Notes: Excludes off-road fleet because most of that activity is contracted.

Sources:

[1] Based on Fleet Electrification Plan information and phasing provided by COEG.

[2] Based on EMFAC averages. Accounts for Advanced Clean Cars 2.

[3] http://www.fueleconomy.gov/feg/download.shtml (Without EV efficiency forecasts, EV efficiency assumed to be the same for all future years).

[4] average for 4 stroke engine.

[5] https://www.energy.gov/sites/prod/files/2014/04/f15/10097517.pdf.

WW-1

Reduce Water Use

	2021	2030	2045
Total electricity consumption for water usage (MWh)	37	49	64
Total emissions from water usage (MTCO2e)	9	9	0
Emissions from outdoor water usage (MTCO2e)	5	6	—
Outdoor water consumption reduction target		10%	30%
Emissions from outdoor water usage after strategy implementation (MTCO2e)		5	—
Emissions from indoor water usage (MTCO2e)	4	4	—
Indoor water consumption reduction target		10%	20%
Emissions from indoor water usage after strategy implementation (MTCO2e)		3	—
GHG reductions from water retrofit upgrades (MTCO2e)		**1**	**—**
GHG Reductions from WW-1 (MTCO2e)		**1**	**—**
Water consumption as per Elk Grove Water District [1]			
Outdoor water consumption	60%		
Indoor water consumption	40%		

Source:

[1] Elk Grove Water District. Conservation Resources. Available: https://www.egwd.org/conservation-resources/#around-the-house.

WW-2

Practice Sustainable Waste Management

	2021	2030	2045
Landfilled solid waste (tons)	375	496	644
Emissions from landfilled solid waste	107	142	184
Statewide Diversion Rate [1]	46%		
Statewide Disposal Rate per Day (pounds per person per day) [1]	6.4		
Statewide Disposal Rate per Day (tons per person per year)	1.1680		
Average Solid Waste Disposal Per Employee (tons/employee/year)	0.88	0.88	0.88
Municipal operations waste diversion target	59%	65%	80%
Increased waste diversion		6%	21%
Adjusted forecasted emissions from solid waste (MTCO2e)		121	90
GHG reductions from zero waste (MTCO2e)		**20**	**94**
GHG Reductions from WW-2 (MTCO2e)		**20**	**94**

Source:

[1] State of Disposal and Recycling for Calendar Year 2021. CalRecycle 2022. Available: https://www2.calrecycle.ca.gov/Publications/Download/1890.

Appendix E

Climate Adaptation Policy Analysis

Memo

455 Capitol Mall, Suite 300
Sacramento, CA 95814
916.444.7301

Date: March 20, 2024

To: Jon Hobbs (City Attorney)

CC: Carrie Whitlock and Christopher Jordan (City of Elk Grove)

From: John Steponick, Hannah Kornfeld, Erik de Kok, and Honey Walters (Ascent)

Subject: Elk Grove Climate Compass Final Technical Memorandum – Climate Adaptation Policy Analysis

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INTRODUCTION

The City of Elk Grove (hereinafter referred to as "city"), incorporated in 2000, is one of the fastest-growing cities in the state. Due to projected population growth and an increase in economic opportunities, the City of Elk Grove government (hereinafter referred to as "COEG") has an opportunity to further model how fast-growing cities can set and achieve broader sustainability- and resilience-related goals, while addressing the issue of climate change, through updating its 2019 Climate Action Plan (CAP). The 2019 CAP serves as a strategic planning document that demonstrates COEG's commitment to reducing greenhouse gas (GHG) emissions and includes an accounting of GHG emission sources within the city, along with a framework for reducing emissions. Though the 2019 CAP briefly touches upon the topics of adaptation and resilience, it does not present a set of adaptation strategies intended to build resilience to the effects of climate change—this has largely been done through other local planning efforts, such as the *City of Elk Grove Community Mobility Resilience Plan* (CMRP). The forthcoming update to the 2019 CAP (hereinafter referred to as the "Climate Compass") seeks to present a consolidated set of adaptation strategies through: (1) summarizing and revising existing adaptation strategies across other local planning efforts; and (2) developing new adaptation strategies to bridge any gaps that currently exist. This Technical Memorandum (memo) serves as a primary step in achieving these objectives for the Climate Compass. The structure of this memo is as follows:

- Section 1: Climate Hazards.
- Section 2: Prior Planning Efforts.
- Section 3: Discussion.
- Section 4: References.

1 CLIMATE HAZARDS

As COEG continues to play its part in combatting climate change through reducing local GHG emissions, it must also prepare for the impacts of climate change and bolster the resilience of its communities to climate hazards. Climate hazards refer to natural hazards that are exacerbated or altered due to the effects of climate change (e.g., rising temperatures, changing precipitation patterns). The four primary climate hazards that the city is already experiencing and will continue to experience in the future are: (1) extreme heat; (2) flooding; (3) wildfire; and (4) drought. While this memo does not include a comprehensive vulnerability assessment analyzing the city's exposure, sensitivity, potential impacts, adaptive capacity, and vulnerability to each climate hazard (in accordance with the *California Adaptation Planning Guide*), a snapshot of some relevant climate indicators, including their modeled historic averages and future projections at the mid-century (2035-2064) and late-century (2070-2099) timescales, is presented in **Table 1** below (CEC 2023). Each of these climate indicators are either directly or indirectly related to the primary climate hazards within the city and provide some high-level insights as to what the city may experience in the future, depending on current and future global GHG emissions levels.

Table 1 Local Climate Change Snapshot for City of Elk Grove

Climate Indicator	Modeled Historic (1961-1990)	Mid-Century (2035-2064) RCP 4.5[1]	Mid-Century (2035-2064) RCP 8.5[2]	Late-Century (2070-2099) RCP 4.5[1]	Late-Century (2070-2099) RCP 8.5[2]
Average Annual Maximum Temperature (°F)	73.8	77.6	78.4	78.6	81.7
Average Annual Maximum Temperature Difference from Historic (±°F)	N/A	+3.8	+4.6	+4.8	+7.9
Average Annual Minimum Temperature (°F)	48.4	51.6	52.5	52.6	55.6
Average Annual Minimum Temperature Difference from Historic (±°F)	N/A	+3.2	+4.1	+4.2	+7.2
Number of Extreme Heat Days[3]	4	16	20	21	40
Number of Extreme Heat Days[3] Difference from Historic (±days)	N/A	+12	+16	+17	+36
Maximum 1-Day Precipitation (inches)	1.44	1.52	1.54	1.55	1.65
Maximum 1-Day Precipitation Difference from Historic (±inches)	N/A	+0.08	+0.10	+0.11	+0.21
Average Annual Precipitation (inches)	18.2	17.9	18.3	18.4	18.7
Average Annual Precipitation (±inches)	N/A	-0.3	+0.1	+0.2	+0.5
Maximum Length of Dry Spell[4] (days)	126	133	134	135	141
Maximum Length of Dry Spell[4] (±days)	N/A	+7	+8	+9	+15
KBDI[5] > 600 (days)	79	121	124	126	150
KBDI[5] > 600 Difference from Historic (±days)	N/A	+42	+45	+47	+71

Notes: °F = degrees Fahrenheit; ± = plus/minus; KBDI = Keetch-Byram Drought Index; N/A = not applicable; RCP = Representative Concentration Pathway.

[1] RCP 4.5 represents a medium global GHG emissions scenario.

[2] RCP 8.5 represents a high global GHG emissions scenario.

[3] The threshold for an extreme heat day in the city is 103.1 °F.

[4] A dry spell refers to the number of consecutive days with precipitation under 1 millimeter.

[5] KBDI provides an estimate for how dry the soil and vegetative detritus is. A KBDI value greater than 600 indicates a severe drought with extreme wildfire risk.

Source: CEC 2023.

Overall, each climate hazard that the city is experiencing is projected to worsen without intervention or become altered in some way, as shown from the climate indicators in the table. The potential impacts from these climate hazards in the future can be severe, and can affect the city's populations, built and natural environments, and community functions. Noting all of this, COEG has completed planning efforts to address these climate hazards, which are discussed further in Section 2 below.

2 PRIOR PLANNING EFFORTS

While the COEG's 2019 CAP presents a framework for reducing GHG emissions, it does not directly address climate change adaptation. However, many of COEG's other planning efforts have previously addressed adaptation, including:

- (1) the CMRP;
- (2) the *City of Elk Grove General Plan, Chapter 8: Services, Health, and Safety* (General Plan Chapter 8);
- (3) the Vulnerability Assessment presented in the *City of Elk Grove General Plan, Chapter 12: Technical Appendix* (General Plan VA); and
- (4) the *Sacramento County Multi-Jurisdictional Local Hazard Mitigation Plan Update, Annex B: City of Elk Grove* (LHMP Annex).

This section of the memo, serves to summarize the adaptation strategies, policies, and actions across these prior planning efforts and evaluate which climate hazard(s) are addressed by each. Ultimately, the Climate Compass will identify a framework and present a set of adaptation strategies that are informed by and/or consolidate prior adaptation-related planning efforts and address any inconsistencies and critical gaps from prior efforts (discussed further in Section 3).

2.1 CITY OF ELK GROVE COMMUNITY MOBILITY RESILIENCE PLAN

The CMRP is COEG's primary existing climate change adaptation planning document. It was developed both to identify how natural hazards will be influenced by climate change through the end of the century (i.e., through 2099) and to provide a comprehensive set of strategies to adapt to the impacts of climate change (COEG 2021). These strategies are presented in Table 2 below, though they are presented in greater detail in the CMRP document, which also displays the adaptation mechanism[1], implementation mechanism[2], responsible City department(s), and timescale associated with each strategy. In total, the CMRP includes a total of 33 strategies —19 that explicitly address extreme heat, 17 that explicitly address flooding, one that explicitly addresses wildfire, and one that explicitly addresses drought. Some strategies also implicitly address one or multiple climate hazards. Because some strategies address multiple climate hazards, the sum of the number of strategies that address each climate hazard does not equate to the total number of strategies presented in the CMRP.

[1] Adaptation mechanism describes the principle being used to increase resilience and mitigate impacts.

[2] Implementation mechanism describes how the strategy would be implemented. The mechanisms in this category are consistent with those included in the US Environmental Protection Agency's Regional Resilience Toolkit (COEG 2021).

Table 2 Adaptation Strategies from CMRP

Strategy Number	Strategy Name	Strategy Details	Climate Hazard(s) Addressed
3.1-A	Upgrade Pavement Design Standards for Extreme Heat	Research options and upgrade the City's Construction Specification Manual and Improvement Standards Manual to better adapt to increases in extreme heat days and heat wave events. For flexible pavements, explore upgrading heat-resistant asphalt mixes, including increasing the high-temperature asphalt binder grade. For rigid pavements (i.e., concrete), explore design options for roadways and bridges, including using shorter joint spacing, thicker slabs, less rigid support, and enhanced load transfer techniques.	Extreme Heat
3.1-B	Assess the Roadway Network's Vulnerability to Long-Term Drought	Assess vulnerabilities and potential impact to the City's transportation assets from a long-term drought scenario. Focus the assessment on the City's most critical (e.g., high-volume roadways) transportation assets, including bridges, roadways, and levee's owned and maintained by the City.	Drought
3.1-C	Increase Resilience and Redundancy in the City's Truck Routes	Prioritize upgrades to the City's existing truck routes, using the City's updated design standards, to mitigate roadway impacts from extreme heat days and heat wave events. Explore options for designating alternative routes for freight and heavy trucks that are equally more robust than existing routes to use during heat wave events.	Extreme Heat
3.1-D	Plan for Alternative Construction Schedules to Avoid Disruptions from Extreme Heat	Assess how projected increases in temperature and extreme heat events will affect construction schedules for capital improvement projects in the City. Develop a strategy to adjust construction schedules to avoid impacts from extreme heat on the construction and design of roadway improvement projects as well as impacts on construction workers. Consider opportunities to shift construction projects to winter and spring months to avoid disruptions from heat wave events.	Extreme Heat
3.1-E	Create a Climate Smart Stormwater Management System	Work with Sacramento County to conduct appropriate analysis and begin the process to update the intensity, duration, and frequency curves used in stormwater infrastructure standards used for managing localized runoff and smaller precipitation events. Incorporate updated modeling in standards for new development in the City, including capital improvement projects and the City's SDMP. Develop a comprehensive list of existing stormwater and drainage facilities that are at increased risk from failure or loss of performance from increases in the intensity of storm events. Explore opportunities to add redundancy to the City's existing stormwater and flood management systems (e.g., additional detention basins) to mitigate impacts from increased storm intensities as needed. Explore and identify feasible strategies (e.g., riprap, hardening) to mitigate scour for bridges. Identify critical bridges (e.g., high-volume roadways) and prioritize improvements to these bridges to prevent scour and asset failure.	Flooding
3.1-F	Prevent Roadway Degradation and Increase Local Flood Monitoring	Explore options and implement strategy to increase durability of materials and roadway subbase design to mitigate degradation impacts from future storm intensities. Develop, regularly update, and publish a map of areas in the City prone to localized flooding that includes the latest observational data on localized flooding near creeks, waterways, roads, and other emerging flooding areas.	Flooding
3.1-G	Support a Coordinated Regional Climate Smart Flood Management System	Work with State and regional partners, including, but not limited to, DWR, SAFCA, and Sacramento County, to explore options and costs for conducting a hydraulic study of waterways in the City that incorporates future intensities of large regional storm events (i.e., 50-, 100-, 200-year storms) affecting regional waterways that could impact the City (e.g., Sacramento River, Cosumnes River).	Flooding
3.1-H	Upgrade the City's Laguna West Levee System to Mitigate Climate-Related Flood Impacts	Continue to evaluate potential upgrades to the Laguna West levee system to increase the City's resilience to large-scale flooding events. This strategy aligns with Action 9.6, "Infrastructure to Reduce Flood Hazards," and Action 9.5, "Floodplain Data Update," in the GP Implementation Strategy.	Flooding

Strategy Number	Strategy Name	Strategy Details	Climate Hazard(s) Addressed
3.1-I	Support Updates to the Regional Flood Warning System	Support updates to Sacramento County's early warning system from flood events and implement strategies to increase public awareness of the warning system.	Flooding
3.2-A	Increase the Resilience of the City's Public Transit System	Work with Sacramento Regional Transit District to assess vulnerabilities to transportation operations of the e-Tran system. Incorporate projections of future extreme heat impacts into the transition to electric buses and the purchase of new transit vehicles as part of the Innovative Clean Transit regulations.	Extreme Heat
3.2-B	Establish a Resilient Pedestrian and Bicycle Infrastructure Network	Incorporate projections of future extreme heat impacts into the design and development of pedestrian and bicycle infrastructure in the City. Identify opportunities to upgrade existing bicycle and pedestrian infrastructure to mitigate future extreme heat impacts and ensure comfort for users (e.g., tree canopy, high-albedo surfaces).	Extreme Heat
3.2-C	Increase the Resilience of City Traffic Operations from Extreme Heat	Identify and prioritize updates to high-volume roadways and truck routes that will be affected by extreme heat events. Use information from Section 2.2.1 to inform strategy implementation. Identify potential vulnerabilities to signal operations from extreme heat events, including issues presented during brownouts and blackouts from prolonged heat waves.	Extreme Heat
3.2-D	Support a Resilient Rail Network	Work with Union Pacific to identify segments of railway particularly vulnerable to flooding impacts and potential subgrade erosion. Work with Union Pacific and the California Public Utilities Commission Railroad Operations and Safety Branch to assess risk level and upgrades needed to mitigate future storm intensities.	Flooding
3.2-E	Ensure Robust Communication During Flood Events	Develop a City-specific flood warning website and notification system to notify residents about flood areas in the City to help residents avoid flooded areas and reduce impacts to traffic operations. This strategy aligns with GP Implementation Strategy Action 9.11, "Public Information on Preparedness and Services for Extreme Weather Events."	Flooding
3.2-F	Increase the Resilience of City Traffic Operations from Flood Events	Analyze the City's traffic signal system to identify key points of sensitivity to flooding. Prioritize reducing risk of flooding impacts to key points of sensitivity for the City's traffic signal system.	Flooding
3.3-A	Implement Cool Pavement Road Map for the City	Develop and implement a cool pavement "road map" to implement Policy ER-6-4 of the City's GP, which focuses on using cool pavements and higher-albedo impervious materials, as well as trees and foliage along rights-of-way. This strategy aligns with GP Implementation Strategy Action 13.2, "Public Works Standards."	Extreme Heat
3.3-B	Implement a Comprehensive and Climate Smart Green Infrastructure Strategy	Require larger land development projects to incorporate principles of green infrastructure (e.g., bioswales, permeable pavements, rain gardens, linear parks, green roofs), which help mitigate the UHI effect in the City. Work with the Sacramento Tree Foundation to implement measure BE-9 (Increase Tree Planting) of the City's CAP, which focuses on increasing tree planting to sequester carbon. Ensure that implementation of the strategy considers projected increases in temperature and precipitation in the selection of tree varieties to be planted. This strategy aligns with GP Implementation Strategy Action 12.1, "Urban Forest." Review and update Chapter 23.54, "Landscaping," of the City's Municipal Code and other design guidelines to incorporate strategies to mitigate future increases in temperature and extreme heat events and mitigate the UHI effect in new development.	Extreme Heat Flooding

Strategy Number	Strategy Name	Strategy Details	Climate Hazard(s) Addressed
3.3-C	Support a Climate Smart Building Code	As part of the implementation of the City's Climate Action Plan measure BE-5 (Building Stock: Phase in Zero Net Energy Standards in New Construction), incorporate projected increases in temperature and extreme heat events in building standards to mitigate impacts from the UHI effect on energy demand. Explore cost-effective strategies to integrate green roofs into the City's building code with consideration of solar photovoltaic system requirements for new development. Incentivize new development projects to include green roofs and high-albedo roofs	Extreme Heat Flooding
3.3-D	Support Climate-Smart Parks and Recreation Areas	Work with CCSD to develop a strategy to educate populations that frequently use parks and recreation areas (e.g., sports teams) about the public health effects of extreme heat. Ensure facilities are adequately prepared to help mitigate heat impacts. Prioritize upgrades to park facilities owned and operated by the City.	Extreme Heat
3.3-E	Create a Comprehensive Climate Smart Green Infrastructure Plan and Prioritize Sustainable Flood Management That Includes Ecosystem Benefits	Develop a comprehensive plan and set targets to decrease stormwater runoff from existing residential and nonresidential land uses, as well as City facilities, through green infrastructure approaches (e.g., rain gardens, rainwater catchment barrels, green stormwater infrastructure, permeable parking lots, and pavement) to help offset impacts on the City's stormwater management system from climate change. This strategy aligns with GP Implementation Strategy Action 1.8, "Sustainable Stormwater Management Ordinance." Prioritize sustainable flood risk management strategies that provide increased flood protection and ecosystem benefits (e.g., increased creek setbacks, increased open space, sponge City strategies, bioswales). This strategy aligns with GP Implementation Strategy Action 8.3 "Open Space Conservation and Management Plan."	Extreme Heat Flooding
3.3-F	Require Climate Smart Flood Protection for New Development	In coordination with future updates to the Central Valley Flood Protection Plan (per Senate Bill 5), continue to assess Urban Level of Protection for properties in the City and update the City's elevation and construction standards accordingly for new construction. As part of this process, identify list of priority critical facilities that are at increased risk from flooding based on hydraulic modeling that includes future storm intensities. Implement strategies to reduce risk for flooding in and near these facilities, including potential relocation of facilities.	Flooding
3.3-G	Explore Options for Climate Smart Permeable Pavements	Assess feasibility of incorporating permeable pavements into aspects of the City's infrastructure to decrease stormwater runoff impacts during storm events. Conduct pilot project at a City facility to better understand opportunities, costs and benefits.	Flooding
3.4-A	Protect Vulnerable Populations from Heat-Related Climate Impacts	Identify areas in the City with increased concentrations of older residents and areas with increased density of elderly care facilities and senior homes. Work with community organizations and the County Health Department to provide additional resources and training to staff working with elderly populations on how to prevent health-related impacts from extreme heat. Use resources developed by the American Association of Retired Persons and work with the organization to educate elderly populations in the City about health impacts from extreme heat events and strategies to prevent these impacts. Work with community organizations and schools to help mitigate the impacts of extreme heat and heat wave events on youth. Educate and train staff working with youth populations on how to prevent health-related impacts from extreme heat. Review and update the City's Construction Specification Manual to bolster protections for construction workers working in the City. Provide educational material to construction workers and City staff who work outside about best practices to reduce health impacts from extreme heat.	Extreme Heat
3.4-B	Implement Training and Education for Heat-Related Impacts	Increase education and training opportunities for residents to prepare for extreme heat events, with a prioritization on vulnerable populations and on businesses and institutions that house and/or support vulnerable populations. This strategy aligns with GP Implementation Strategy Action 15.2, "Outreach Techniques for Minority and Disadvantaged Communities."	Extreme Heat

Strategy Number	Strategy Name	Strategy Details	Climate Hazard(s) Addressed
3.4-C	Develop a Network of Cool Zones for Heat Wave Events	Develop a strategy to work with local businesses that volunteer to serve as "cool zones" during extreme heat days and allow residents to cool off in air-conditioned spaces in these businesses (e.g., coffee shops, movie theater). Provide information about the location of these cool zones to City residents.	Extreme Heat
3.4-D	Support a Climate Smart Electricity Grid	Work with SMUD to promote and help educate residents about SMUD's time-of-day energy rates and the cost benefits of reducing electricity use during peak demand periods. Work to support further adaptation and resilience efforts initiated by SMUD that affect the City. This strategy aligns with Action 2.13, "Energy Efficiency in Housing," in the GP Implementation Strategy.	Extreme Heat* Wildfire*
3.4-E	Support Climate Smart Emergency Services	Develop or adapt an existing assessment program to ensure that emergency services in the City are adequately prepared for future impacts from extreme heat events. Assess internal emergency service operations (e.g., emergency service vehicles, facilities, staff) to identify sensitivities to extreme heat events.	Extreme Heat
3.4-F	Develop a Community-Led Wildfire Smoke Strategy	Assess the City's capacity to respond to impacts from wildfire smoke on residents and increase the City's capacity to respond to these events, if needed. Work with community organizations to develop a strategy to ensure residents, particularly vulnerable populations, are educated and prepared to respond to wildfire smoke events.	Wildfire
3.4-G	Develop Neighborhood Readiness Plans and Promote Flood Preparedness Education	Work with community organizations to develop neighborhood readiness plans for areas of the City at increased risk of flooding. Identify priority (i.e., flood prone) neighborhoods to serve as pilot plans for this strategy. Work with Sacramento County OES, community organizations, and regional partners to develop neighborhood readiness plans. Use the planning process to increase flood preparedness education and training opportunities for City residents.	Flooding
3.4-H	Support Climate Smart Capital Improvement Projects	Incorporate updated precipitation and storm intensity data into the City's capital improvements planning process, specifically projects in areas anticipated to be impacted by future flood events.	Flooding
3.5-A	Support Incentives to Shift Energy Demand and Offset Costs for Low-Income Residents	Work with SMUD and regional partners to promote energy efficiency upgrades and behavior change that reduces energy demand for cooling and provide cost savings for low-income residents.	Extreme Heat* Wildfire*
3.5-B	Support Post-Disaster Recovery Efforts	Explore opportunities to expand access to post-disaster recovery resources for residents and businesses (e.g., recovery funding, recovery services) and remove barriers for rebuilding in post-disaster situations. This strategy aligns with GP Implementation Strategy Action 9.3, "Post Disaster Recovery Ordinance."	Extreme Heat* Flooding* Wildfire* Drought*
3.5-C	Implement and Maintain a Climate-Specific Infrastructure Fund	Identify and prepare funding as part of the City's General Reserve fund for future repairs to damaged infrastructure that may be required due to increased stress from extreme heat, extreme storms, and other climate impacts. This strategy aligns with GP Implementation Strategy Action 9.12, "Climate-related Infrastructure Repair Reserve."	Extreme Heat Flooding Wildfire* Drought*

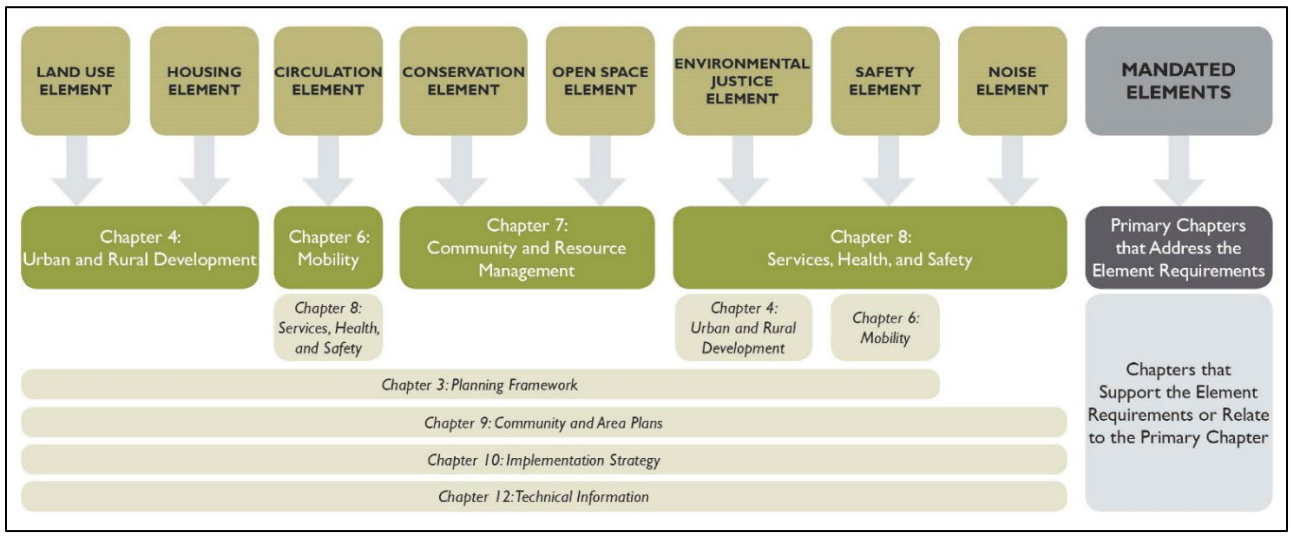
Notes: All information presented in this table was directly informed by the CMRP, except for the "Climate Hazard(s) Addressed" column which was determined by Ascent as part of this memo. Asterisks (*) within the "Climate Hazard(s) Addressed" column indicate a climate hazard that is not explicitly addressed by the associated strategy but is implied to be addressed by it due to either: (1) the broad or overarching nature of the strategy, in which it inherently addresses all climate hazards; or (2) the strategy addressing it indirectly or as a co-benefit upon implementation. CAP = Climate Action Plan; CCSD = Cosumnes Community Services District; DWR = California Department of Water Resources; GP = General Plan; OES = Office of Emergency Services; SAFCA = Sacramento Area Flood Control Agency; SDMP = Storm Drainage Master Plan; SMUD = Sacramento Municipal Utility District; UHI = urban heat island.

Source: Compiled by Ascent in 2023.

2.2 CITY OF ELK GROVE GENERAL PLAN, CHAPTER 8: SERVICES, HEALTH, AND SAFETY

Broadly, the *City of Elk Grove General Plan* (General Plan) lays out the community vision for the future of the city. It is the primary governing document that determines future jobs, housing, and growth within the community, and since incorporation, the city has grown and changed considerably. It is organized by 12 distinct chapters that, collectively, address all the elements mandated by State law (see Figure 1 below).

Figure 1 City of Elk Grove General Plan Organization and Mandated Elements



Source: COEG 2019.

Of all the chapters contained within the General Plan, Chapter 8 is the one that addresses climate change adaptation, primarily through the Safety Element. General Plan Chapter 8 contains a large suite of policies that are informed by the following eight factors that affect quality of life in the community: (1) coordinated emergency preparedness and response; (2) critical facilities; (3) resilient design against natural and human-made disasters; (4) a focus on public safety and emergency responsiveness; (5) high standards for providing and funding urban infrastructure; (6) innovative community services; (7) equitable access to programs and services; (8) a healthy community (COEG 2022a). It should be noted that many of the policies within Chapter 8 are informed by the General Plan VA, which is discussed further in Section 2.3. Additionally, unlike the other planning efforts summarized and evaluated in this memo, the policies presented in General Plan Chapter 8 are not all related to climate change adaptation. Of the 114 policies contained within Chapter 8, five explicitly address extreme heat, 20 explicitly address flooding, five explicitly address wildfire, and six explicitly address drought. Some strategies also implicitly address one or multiple climate hazards, but the majority of policies in General Plan Chapter 8 are not climate change adaptation-related. All the policies that relate to climate change adaptation are presented in Table 3 below.

The General Plan also contains an implementation strategy that provides a framework to coordinate citywide efforts to execute the policies identified throughout the plan, including those contained within General Plan Chapter 8, and a structure for monitoring, maintaining, and updating the document throughout the planning horizon. Specifically, implementation of the General Plan is done through a series of actions identified within the implementation strategy, which represent extensions of the policies identified throughout the General Plan. Each of these detailed actions indicates the timescale, responsible City department(s), and associated policies that the action is meant to successfully address (COEG 2022b). However, it should be noted that not every climate change adaptation-related policy contained within General Plan Chapter 8 is referenced within the implementation strategy actions.

Table 3 Adaptation Policies from General Plan Chapter 8

Policy #	Policy	Climate Hazard(s) Addressed
EM-1-1	Seek to maintain acceptable levels of risk of injury, death, and property damage resulting from reasonably foreseeable safety hazards.	Extreme Heat* Flooding* Wildfire* Drought*
EM-1-2	Cooperate with other local, regional, State, and federal agencies and with rail carriers in an effort to secure the safety of all residents and businesses.	Extreme Heat* Flooding* Wildfire* Drought*
EM-1-3	Establish local ordinances and programs to guide and support disaster recovery efforts.	Extreme Heat* Flooding* Wildfire* Drought*
ER-2-1	Oppose the construction of flood management facilities that would alter or reduce flows in the Cosumnes River and support retention of the Cosumnes River floodplain in nonurban uses consistent with location in an area subject to flooding.	Flooding
ER-2-2	Require that all new projects not result in new or increased flooding impacts on adjoining parcels or on upstream and downstream areas.	Flooding
ER-2-3	Locate, and encourage other agencies to locate, new essential government service facilities and essential healthcare facilities outside of 100-year and 200-year flood hazard zones, except in cases where such locations would compromise facility functioning.	Flooding
ER-2-4	Relocate or harden existing essential government service facilities and essential healthcare facilities that are currently located inside of the 100-year and 200-year flood hazard zones.	Flooding
ER-2-5	Give priority to the designation of appropriate land uses in areas subject to flooding to reduce risks to life and property. Construction of new flood management projects shall have a lower priority, unless land use controls (such as limiting new development in flood-prone areas) are not sufficient to reduce hazards to life and property to acceptable levels.	Flooding
ER-2-6	Development shall not be permitted on land subject to flooding during a 100-year event, based on the most recent floodplain mapping prepared by FEMA or updated mapping acceptable to the City of Elk Grove. Potential development in areas subject to flooding may be clustered onto portions of a site which are not subject to flooding, consistent with other policies of this General Plan.	Flooding
ER-2-7	A buildable area outside the 100-year floodplain must be present on every residential lot sufficient to accommodate a residence and associated structures. Fill may be placed to create a buildable area only if approved by the City and in accordance with all other applicable policies and regulations. The use of fill in the 100-year floodplain to create buildable area is strongly discouraged and shall be subject to review to determine potential impacts on wildlife, habitat, and flooding on other parcels.	Flooding
ER-2-8	The City will not enter into a development agreement, approve a building permit or entitlement, or approve a tentative or parcel map for a project located within an urban level of flood protection area, identified in Figure 8-2, unless it meets one or more established flood protection findings. Findings shall be based on substantial evidence, and substantial evidence necessary to determine findings shall be consistent with criteria developed by the DWR.	Flooding
ER-2-9	Ensure common understanding and consistent application of urban level of flood protection criteria and conditions.	Flooding
ER-2-10	Work with regional, county, and State agencies to develop mechanisms to finance the design and construction of flood management and drainage facilities to achieve an urban level of flood protection in affected areas.	Flooding
ER-2-11	Vehicular access to the buildable area of all parcels must be at or above the 10-year flood elevation.	Flooding

Policy #	Policy	Climate Hazard(s) Addressed
ER-2-12	Creation of lots whose access will be inundated by flows resulting from a 10-year or greater storm shall not be allowed. Bridges or similar structures may be used to provide access over creeks or inundated areas, subject to applicable local, State, and federal regulations.	Flooding
ER-2-13	Discourage the number of crossings over natural creeks to reduce potential flooding and access problems.	Flooding
ER-2-14	Parcels should not be created where any of the parcel's access or preservation easements, floodplain, marsh or riparian habitat, or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots, landscape corridors, or other City-approved use specifically created for dedication to the City or another appropriate entity for habitat protection, flood hazard management, drainage, or wetland maintenance.	Flooding
ER-2-15	Where necessary due to clear dangers to life or property, the City will support the construction of flood hazard management projects.	Flooding
ER-2-16	New and modified bridge structures shall not cause an increase in water surface elevations of the 100-year floodplain exceeding 1 foot unless analysis clearly indicates that the physical and/or economic use of upstream property will not be adversely affected.	Flooding
ER-2-17	Require all new development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing comprehensive drainage plans.	Flooding
ER-2-18	Drainage facilities shall be properly maintained to ensure their proper operation during storms.	Flooding
ER-4-1	Cooperate with the CCSD Fire Department to reduce fire hazards, assist in fire suppression, and promote fire safety in Elk Grove.	Wildfire
ER-4-2	Work with the CCSD to develop a fire prevention plan that lists major fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard.	Wildfire
ER-6-1	In the event of severe weather conditions such as excessive heat, provide dedicated response services including the deployment of emergency services, opening of local cooling shelters, and community notifications.	Extreme Heat Flooding*
ER-6-2	Coordinate with Sacramento County OES and the County Department of Public Health to provide information to vulnerable populations on available resources and key actions to take for mitigation on their property in preparation of excessive heat events and services during events.	Extreme Heat
ER-6-3	Participate in regional activities and initiatives to help reduce risks and economic impacts of potential disasters related to extreme weather.	Extreme Heat Flooding*
ER-6-4	In construction of new roadways, utilize cool pavements and higher-albedo impervious materials as well as trees and foliage along rights-of-way.	Extreme Heat
ER-6-5	Allocate funds as appropriate to address anticipated additional repairs to damaged infrastructure that will be required due to increased stress from climate effects such as extreme heat and storms.	Extreme Heat Flooding
ER-6-6	Work with SCWA, Elk Grove Water District, and other water utilities to support programs and conservation activities intended to help water customers voluntarily conserve approximately 10 percent over time.	Drought
ER-6-7	Enforce the City's water-efficient landscape ordinance that is as strict as or stricter than the State Water Resources Control Board regulations affecting local water agencies and ensure future state updates are incorporated in some form to the City's ordinance. Provide opportunity for and encourage public reporting of violations.	Drought
ER-6-8	Continue to participate in the Sacramento Stormwater Quality Partnership to educate and inform the public about urban runoff pollution, work with industries and businesses to encourage pollution prevention, require construction activities to reduce erosion and pollution, and require developing projects to include pollution controls that will continue to operate after construction is complete.	Drought

Policy #	Policy	Climate Hazard(s) Addressed
ER-6-9	Participate in the development and implementation of Cosumnes Fire Department's Community CWPP for the protection of human life and reduction in loss of property, critical infrastructure, and natural resources associated with wildfire.	Wildfire
ER-6-10	Distribute information that SMAQMD publicizes on the status of air quality on a daily basis, providing alerts on poor air quality days and educational material on the health effects of air pollution.	Wildfire
ER-6-11	Seek to provide the community with information relating to sustainability, climate change, and innovative development strategies.	Extreme Heat* Flooding* Wildfire* Drought*
SAF-1-3	Coordinate with the CCSD Fire Department to ensure that new station siting and resources are available to serve local needs.	Wildfire
SAF-1-4	Expand emergency response services as needed due to community growth.	Extreme Heat* Flooding* Wildfire* Drought*
SAF-1-6	Require adequate emergency access for new development projects.	Flooding* Wildfire*
INF-1-1	Water supply and delivery systems shall be available in time to meet the demand created by new development.	Drought
INF-1-3	Protect the quality and quantity of groundwater resources, including those which serve households and businesses which rely on private wells. The City shall support and participate in local efforts to implement the State's Sustainable Groundwater Management Act.	Drought
INF-1-4	Work with Regional San and SCWA to expand recycled water infrastructure for residential, commercial, industrial, and recreational facilities and support the use of reclaimed water for irrigation wherever feasible.	Drought

Notes: All information presented in this table was directly informed by General Plan Chapter 8, except for the "Climate Hazard(s) Addressed" column which was determined by Ascent as part of this Memo. Asterisks (*) within the "Climate Hazard(s) Addressed" column indicate a climate hazard that is not explicitly addressed by the associated policy but is implied to be addressed by it due to either: (1) the broad or overarching nature of the policy, in which it inherently addresses all climate hazards; or (2) the policy addressing it indirectly or as a co-benefit upon implementation. CCSD = Cosumnes Community Services District; CWPP = Community Wildfire Protection Plan; OES = Office of Emergency Services; Regional San = Sacramento Regional County Sanitation District; SCWA = Sacramento County Water Agency; SMAQMD = Sacramento Metropolitan Air Quality Management District.

Source: Compiled by Ascent in 2023.

2.3 VULNERABILITY ASSESSMENT PRESENTED IN THE CITY OF ELK GROVE GENERAL PLAN, CHAPTER 12: TECHNICAL APPENDIX

Section 65302 of the California Government Code requires every general plan safety element to include a vulnerability assessment identifying the risks that climate change poses and the geographic areas at risk from climate change impacts (COEG 2017). The General Plan VA satisfies this requirement and serves as the technical basis for informing policies throughout the General Plan, notably those in Chapter 8. Though it is intended to inform policies throughout the General Plan, recommended actions are also presented directly in the General Plan VA, some of which are not reflected in General Plan policies (though several are, which is important to note as some are double counted here and in the General Plan Chapter 8 summary). These recommended actions are presented in **Table 4** below. Unlike the other documents summarized in this memo, the actions presented within the General Plan VA are presented in their entirety here, as there are no additional implementation details identified (e.g., responsible City department(s), timescale). In total, there are 12 recommended actions presented in the General Plan VA—five that address extreme heat, three that address flooding, two that address wildfire, and three that address drought. Some of

the recommended actions also implicitly address one or multiple climate hazards. Because some recommended actions address multiple climate hazards, the sum of the number of strategies that address each individual climate hazard does not equate to the total number of strategies presented in the General Plan VA.

Table 4 Recommended Adaptation Actions from General Plan VA

Action Number	Action	Climate Hazard(s) Addressed
1	Develop a guide of City procedures in the event of severe weather conditions such as excessive heat, including the deployment of emergency services, opening of local cooling shelters, and community notification procedures.	Extreme Heat
2	Coordinate with the Sacramento County OES and Sacramento County Public Health Department to provide information to vulnerable populations on the resources available and the key actions to take both for mitigation on their property in preparation of excessive heat events and for services during such events.	Extreme Heat
3	Participate in the regional leadership organization, Valley Vision, which has launched the BRI to help reduce the risks and economic impacts of potential disasters related to extreme weather.	Extreme Heat Flooding* Wildfire* Drought*
4	Utilize cool pavements and higher-albedo impervious materials in construction of new roadways, as well as trees and foliage along rights-of-way.	Extreme Heat Flooding*
5	Allocate funding to address anticipated repairs to damaged infrastructure that will be required due to increased stress from climate effects such as extreme heat and storms.	Extreme Heat Flooding
6	Work with SCWA and water utilities to support programs and conservation activities intended to help water customers voluntarily conserve approximately 10 percent over time.	Drought
7	Enforce the water conservation ordinance and encourage public reporting of violations.	Drought
8	Continue to participate in the Sacramento Stormwater Quality Partnership to educate and inform the public about urban runoff pollution, work with industries and businesses to encourage pollution prevention, require construction activities to reduce erosion and pollution, and require developing projects to include pollution controls that will continue to operate after construction is complete.	Drought
9	Facilitate implementation of measures identified in Metro Fire's CWPP to protect human life and property, critical infrastructure, and natural resources associated with wildfire.	Wildfire
10	Distribute information from the SMAQMD to the public on the status of air quality on a daily basis, provide alerts on poor air quality days, and include educational materials on the health effects of air pollution.	Wildfire Drought*
11	Continue to advocate for implementation of regional plans to upgrade levees along Sacramento and American Rivers and to the Folsom Dam and reservoir.	Flooding
12	Continue to implement measures in the adopted Central Valley Flood Protection Plan relevant to Elk Grove.	Flooding

Notes: The actions presented in this table were directly informed by the General Plan VA, though the "Action #" and the "Climate Hazard(s) Addressed" columns were determined by Ascent as part of this memo. Asterisks (*) within the "Climate Hazard(s) Addressed" column indicate a climate hazard that is not explicitly addressed by the associated policy but is implied to be addressed by it due to either: (1) the broad or overarching nature of the policy, in which it inherently addresses all climate hazards; or (2) the policy addressing it indirectly or as a co-benefit upon implementation. BRI = Business Resiliency Initiative; CWPP = Community Wildfire Protection Plan; OES = Office of Emergency Services; SCWA = Sacramento County Water Agency; SMAQMD = Sacramento Metropolitan Air Quality Management District.

Source: Compiled by Ascent in 2023.

2.4 SACRAMENTO COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN UPDATE, ANNEX B: CITY OF ELK GROVE

The *Sacramento County Multi-Jurisdictional Local Hazard Mitigation Plan Update* (LHMP), adopted in September 2021, serves to update the 2016 Federal Emergency Management Agency (FEMA) approved version, and its purpose is to reduce or eliminate long-term risk to people and property from hazards, including climate hazards. The LHMP encompasses Sacramento County, seven incorporated communities (including the city), and 24 special districts. The city's annex to the LHMP (i.e., LHMP Annex) details the hazard mitigation planning elements specific to the city. Based on the risk assessment presented in the LHMP Annex, COEG identified and prioritized an array of mitigation actions, and based on their contents, these mitigation actions can also be considered climate change adaptation actions (County of Sacramento 2021). These actions are presented in **Table 5** below, though they are presented in greater detail in the LHMP Annex document, which also displays details such as issue/background, alternatives, implementation mechanisms, responsible office, priority, and cost estimates. In total, there are nine actions presented in the LHMP Annex—two that address extreme heat, five that address flooding, three that address drought, and three that implicitly address all of the identified climate hazards due to their broad and overarching intent. Because some strategies address multiple climate hazards, the sum of the number of strategies that address each individual climate hazard does not equate to the total number of strategies presented in the LHMP Annex.

Table 5 Adaptation Actions from LHMP Annex

Action Number	Action Name	Action Description	Climate Hazard(s) Addressed
1	Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section provides that local agencies can become eligible for increased state reimbursements if they adopt an LHMP in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.	Extreme Heat* Flooding* Wildfire* Drought*
2	Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms.	Extreme Heat* Flooding* Wildfire* Drought*
3	Elk Grove Green Street Project: Repurposing Urban Runoff with Green Instructure Technologies	The City prioritized a ½ mile section of major roadway for retrofit to repurpose stormwater as groundwater and provide other high-quality benefits in an impaired urbanized watershed. The Project will replace an outdated drainage system and impervious pavement with pervious materials and linear biofiltration planters connected to dry wells along the street frontage. The proposed green infrastructure will: 1) reduce pollutant loads entering Elk Grove Creek, which outfalls into the Stone Lakes National Wildlife Refuge and the Delta, 2) use pretreated urban runoff for groundwater recharge, and 3) provide flood protection. Assuming an average annual rainfall of 18", the 5.56 acre watershed will generate 6.84 acre-feet of stormwater for capture and infiltration. The Project, located on a major arterial that connects elementary, middle, and high schools will provide safer, enhanced pedestrian and bicycle access, traffic calming measures, and will enhance the City's Safe Routes to Schools Program	Flooding Drought

Action Number	Action Name	Action Description	Climate Hazard(s) Addressed
4	Mutual Aid Agreements	Ensure that Mutual Aid Agreements are in place such as: California Master Mutual Aid Agreement, Law Enforcement Mutual Aid Agreement, Fire and Rescue Mutual Aid Agreement (via Cosumnes Fire District), Public Works Mutual Aid Agreement, County of Sacramento Operational Area Council, U.S. Army Corps of Engineers Rehabilitation Inspection PL84-99 Program, NFIP, Sacramento County OES, and Sacramento County EMD.	Extreme Heat* Flooding* Wildfire* Drought*
5	City of Elk Grove's Storm Drainage Master Plan	The SDMP was developed to provide a variety of drainage concepts for upgrading the existing storm drainage and flood control collection system (Drainage System). The SDMP identifies and analyzes the existing drainage deficiencies throughout the City; provides a range of drainage concepts for the construction of future facilities required to serve the City at buildout of the General Plan; and establishes criteria for selecting and prioritizing projects. Furthermore, the SDMP may be utilized for the development of a capital drainage financing program. The SDMP combines the demands of flood-risk reduction with ecosystem enhancements while incorporating urban development and rural residential land uses to provide an effective plan that will meet both the City's and community's vision. A Minor Update to the SDMP was completed in 2019; the main purpose of the update was to provide a summary of projects completed since 2011, provide details regarding remaining projects, including implementation costs and schedules (if available), and provide information regarding new regulatory requirements related to stormwater management and flood control.	Flooding Drought
6	Create a Climate-Smart Stormwater Management System	This work would include several items. 1) Work with Sacramento County to conduct appropriate analysis and begin the process to update the intensity, duration, and frequency curves used in stormwater infrastructure standards used for managing localized runoff and precipitation events. Incorporate updated modeling in standards for new development in the City, including capital improvement projects and the City's SDMP. 2) Develop a comprehensive list of existing stormwater and drainage facilities that are at increased risk from failure or loss of performance from increases in the intensity of storm events. 3) Explore opportunities to add redundancy to the City's existing stormwater and flood management systems (e.g., additional detention basins) to mitigate impacts from increased storm intensities as needed. 4) Explore and identify feasible strategies (e.g., riprap, hardening) to mitigate scour for bridges. Identify critical bridges (e.g., high-volume roadways) and prioritize improvements to these bridges to prevent scour and asset failure.	Flooding
7	Implement a Comprehensive and Climate-Smart Green Infrastructure Strategy	Implement a climate-smart green infrastructure strategy to mitigate and adapt to the impacts of climate change. This project would include several actions, including: 1) updating City Standards to require larger land development projects to incorporate principles of green infrastructure (e.g., bioswales, permeable pavements, rain gardens, linear parks, green roofs), which help mitigate the UHI effect in the City; 2) increase tree planting with a focus on carbon sequestration and environmental justice; and 3) update the City's Municipal Code and other design guidelines to incorporate strategies to mitigate future increases in temperature and extreme heat events and mitigate the UHI effect in new development.	Extreme Heat Flooding Drought
8	Upgrade the City's Laguna West Levee System to Mitigate Climate-Related Flood Impacts	This project would work to develop policies to finance, plan, and construct infrastructure improvements to the Laguna West levee system to increase the City's resilience to large-scale flooding events. The Laguna West levee system is accredited by FEMA as meeting 100-year storm event standards and provides protection to the Laguna West and Lakeside areas. However, the system would need to be raised an average of 3.5 feet to comply with the State 200-year flood protection standard and relieve new development of addition development obligations.	Flooding

Action Number	Action Name	Action Description	Climate Hazard(s) Addressed
9	Establish a Resilient Pedestrian and Bicycle Infrastructure Network	Incorporate projections of future extreme heat impacts into the design and development of pedestrian and bicycle infrastructure in the City. Identify opportunities to upgrade existing Sacramento County City of Elk Grove Annex B-153 Local Hazard Mitigation Plan Update September 2021 bicycle and pedestrian infrastructure to mitigate future extreme heat impacts and ensure comfort for users (e.g., tree canopy, high-albedo surfaces).	Extreme Heat

Notes: All information presented in this table was directly informed by the LHMP Annex, except for the "Climate Hazard(s) Addressed" column which was determined by Ascent as part of this memo. Asterisks (*) within the "Climate Hazard(s) Addressed" column indicate a climate hazard that is not explicitly addressed by the associated action but is implied to be addressed by it due to either: (1) the broad or overarching nature of the action, in which it inherently addresses all climate hazards; or (2) the action addressing it indirectly or as a co-benefit upon implementation. AB = Assembly Bill; EMD = Environmental Management Department; FEMA = Federal Emergency Management Agency; LHMP = Local Hazard Mitigation Plan; NFIP = National Flood Insurance Program; OES = Office of Emergency Services; SDMP = Storm Drainage Master Plan; UHI = urban heat island.

Source: Compiled by Ascent in 2023.

2.5 SUMMARY

Of the primary climate hazards, flooding is addressed the most among the four documents reviewed for this memo with 44 total strategies, policies, and actions that directly address it. This is followed by extreme heat with 28, drought with 14, and wildfire with 9. Additionally, there are between 11 and 13 strategies, policies, and actions that implicitly address each climate hazard. Though these numbers provide some high-level insights as to what degree each climate hazard has been addressed, the numbers alone do not paint a full picture for several reasons: (1) it is unclear how many strategies, policies, and actions have been fully implemented; (2) the effectiveness, success, and longevity of the implemented strategies, policies, and actions have not been evaluated; (3) there may not be enough collective emphasis on certain aspects of the community (e.g., populations, built environment, community functions, ecological integrity, economic continuity) within the strategies, policies, and actions identified in this memo; (4) even if strategies, policies, and actions address certain climate hazards, they may need to be updated or revised to account for future projected conditions; and (5) there may be a need for general climate change adaptation efforts that are not necessarily focused on specific climate hazards. This should all be taken into consideration during Climate Compass and adaptation strategy development.

3 DISCUSSION

This memo serves as a snapshot of four planning documents and to what degree the city's primary climate hazards (i.e., extreme heat, flooding, wildfire, drought) are addressed. Though this memo does not include a comprehensive analysis other than summarizing the existing strategies, policies, and actions in each document and determining which climate hazards are addressed by each, several gaps and inconsistencies were identified that should be taken into consideration for adequately addressing climate change adaptation in the forthcoming Climate Compass. It should be noted that there may be other efforts not identified in this memo that have been or are currently being undertaken by COEG that have climate change adaptation co-benefits, even if adaptation is not an intrinsic focus or goal of the effort. For example, on COEG's website, there is a "Drought Response and Water Conservation" webpage[3] that identifies various efforts and resources related to drought. While this webpage and its contents are not captured in this memo, the identified efforts should be considered and potentially built upon during Climate Compass development. The gaps and inconsistencies are discussed below.

[3] https://www.elkgrovecity.org/drainage/drought-response-and-water-conservation.

- **Status of Prior Planning Efforts**. The status of each of the strategies, policies, and actions identified in this memo is not fully clear, as there are no existing resources that identify this broken down at the strategy, policy, or action level. It is assumed (and known in many cases) that a considerable number of the strategies, policies, and actions have been implemented or are in process, but it is unclear without an authoritative tracking or monitoring resource. In preparation of the Climate Compass and adaptation strategy development, COEG should identify any efforts that have been completed or that are currently ongoing in order to develop a plan that does not duplicate these efforts. Additionally, developing some sort of tracking or monitoring resource (e.g., dashboard, annual report) for any efforts proposed in the Climate Compass should be prioritized to keep track of implementation progress continually and consistently after adoption. This resource could also be used to evaluate the effectiveness of efforts being implemented to help determine if any changes in approach or priorities are needed.
- **Framework**. Each of the documents identified in this memo presents a different framework for addressing climate hazards, as they are different documents with different goals and intentions. For example, the CMRP identifies "strategies," General Plan Chapter 8 identifies "policies" (with an associated, but incomplete, implementation strategy), and the LHMP Annex identifies "actions," all which have differing levels of detail and structure. While these documents provide a foundation, a consistent adaptation framework should be prepared for the Climate Compass that are informed by and/or consolidate the strategies, policies, and actions identified within them. An example of how this could be done is a three-pronged framework of "strategies," "measures," and "actions," where: (1) strategies serve as the overarching foundation for adapting the city to climate change and are inherently broad; (2) measures are more specific expressions of strategies and underscore objectives that should be achieved to successfully adapt; and (3) actions are the specific activities, projects, programs, or policies that COEG can take to implement or support measures. This framework could serve as an option for the Climate Compass, though many other framework options exist (see the draft Santa Clara Valley Transportation Authority Climate Action and Adaptation Plan[4] as an example, where adaptation strategies and actions are grouped by "cross-cutting" and "focused" strategies).
- **Implementation Details**. After an adaptation framework is established during Climate Compass development, a set of consistent implementation details should be developed that are applied to the most specific level of the organizing framework (e.g., using the example in the "Framework" bullet point above, these implementation details would be applied at the "action" level). Implementation details may consist of some of the details that are already identified across the four documents reviewed in this memo, including, but not limited to, responsible City department(s), timescale, and implementation mechanism.

In addition to considering these gaps and inconsistencies (along with the discussion in **Section 2.5**), adaptation strategy development for the Climate Compass should be partially informed by the substance of the strategies, policies, and actions identified in this memo, and revising/consolidating ones that have similar characteristics that would still be relevant. For example, there are several strategies, policies, and actions that are related to installing "cool pavement" throughout the city—if scaling these efforts are desired to help mitigate the urban heat island effect, it should be reflected within the adaptation strategies presented in the Climate Compass. Ultimately, the adaptation strategies that will be developed for the Climate Compass should: (1) consolidate, build upon, and not be duplicative of prior efforts; (2) adequately address all climate hazards (and other adaptation needs) and *all* aspects of the community; (3) be prepared with climate projections in mind; (4) be presented in a consistent, COEG-approved framework with implementation details; and, (5) be tracked and monitored over time to evaluate effectiveness upon implementation and allow for flexibility in revising, adding, or removing adaptation strategies, as needed.

[4] https://www.vta.org/sites/default/files/2023-10/VTA_CAAP_Public_Draft.pdf.

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Appendix F

Implementation Cost Analysis

City of Elk Grove
Climate Compass
Implementation Cost Analysis

Prepared for

City of Elk Grove
8401 Laguna Palms Way
Elk Grove, CA 95758
Carrie Whitlock, AICP
Strategic Planning & Innovation Program Manager

Prepared by

Ascent, Inc.
455 Capitol Mall, Suite 300
Sacramento, CA 95814
Hannah Kornfeld, AICP
Project Manager

June 10, 2025

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GLOSSARY OF TERMS

Capital – An expenditure category that includes capital expenditures such as infrastructure projects and improvements to City facilities.

Department Funded – Actions or programs funded by fees and deposits and all grant programs like vehicle licensing fees, and any department-related funding source.

Existing Program – Any existing action as a part of regular department operations or created through prior Council action.

Existing Staffing – Existing staff positions associated with existing programs.

Expanded Program – Any expansion of an existing program as a result of the Climate Compass that would result in new costs or investments.

Fees & Deposits – Revenues received as a result of fees charged for certain services provided by City departments to residents and other public agencies.

General Purpose Revenue – Revenue derived from sources not specific to any program or service delivery that may be used for any purpose that is a legal expenditure of City funds.

Incremental Cost – Any new cost or investment associated with expanded or new programs as a result of the Climate Compass.

Implementation Costs – Total costs associated with existing, expanded, or new programs.

Incentive – An expenditure category that includes funding mechanisms or other tools used by the City to promote investment and support implementation or adoption of programs.

Inflation Rate – Assumed cost increase of 3 percent annually across all expenditure types for planning purposes only.

New Program – Any new actions or programs as a result of Climate Compass that would result in new costs or investments.

One-Time Activity – Any discrete activity that occurs only once over the Climate Compass implementation timeline such as program development or ordinance adoption.

One-Time Only (OTO) Funding – A City budgeting term to denote funding allocations that are considered and approved each year generally for short term uses.

Ongoing Activity – An activity that occurs over an extended time period such as planting trees annually or monitoring and reporting Climate Compass progress.

Operational Plan – The City's annual financial plan that allocates resources to specific programs and services that support the City's long-term goals; it includes the adopted budget for the first year and a tentative budget that is approved in principle for the second year.

Program Status – Whether a program is existing, expanded, or new.

Salary and Benefits – An expenditure category that includes expenses related to the compensation of City employees such as salaries, wages, health, and retirement benefits.

Services and Supplies – An expenditure category that includes materials, supplies, and consultant costs.

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1 INTRODUCTION AND KEY FINDINGS

The City of Elk Grove (City) is updating its Climate Action Plan, called the Climate Compass, which includes 28 strategies and 113 actions across 10 focus areas to reduce greenhouse gas (GHG) emissions and achieve the City's 2030 and 2045 GHG emissions reduction targets and adapt to anticipated climate-related impacts.

This report summarizes the findings of the Climate Compass Implementation Cost Analysis, which estimates and classifies City costs for implementing Climate Compass strategies and actions to achieve the GHG emissions reduction targets. The goals of this analysis are to:

(1) develop a preliminary estimate of the total cost to the City to implement the Climate Compass over the first five fiscal years (FY 2025/26 – FY 2029/30), including partial costs associated with the Climate Compass adoption year (FY 2025/26) (hereinafter referred to as "Climate Compass implementation costs");

(2) determine the costs of existing programs and incremental (or new) costs associated with expanded and new programs that would not have occurred without the Climate Compass; and

(3) provide City departments with guidance for developing budget requests and identifying funding sources as part of the City's budget process.

Some of the actions involve one-time activities, such as developing a program or plan, or adoption of an ordinance. Others are ongoing activities, such as educating the Elk Grove community about incentives and rebate programs. Each action has an implementation timeframe identified.

1.1 TIMEFRAME OF CLIMATE COMPASS IMPLEMENTATION COST ESTIMATES

Climate Compass implementation costs are estimated for a five fiscal year period including Climate Compass adoption in FY 2025/26. Costs are estimated for each fiscal year and for the total five fiscal year timeframe (FY 2025/26 – FY 2029/30).

This timeframe aligns with the City's financial forecast and annual budget cycle. The current fiscal year, FY 2025/26, is included, as costs associated with Climate Compass adoption year will be accounted for in the mid-year budget adjustment. After Climate Compass adoption, the City will re-evaluate and estimate Climate Compass implementation costs for subsequent fiscal years as part of its annual budget cycle and when the City prepares an update to its Climate Action Plan every five years.

1.2 TYPES OF CITY EXPENDITURES ACCOUNTED FOR IN CLIMATE COMPASS IMPLEMENTATION COST ESTIMATES

The Climate Compass implementation costs presented in this report are estimates of the following types of City government expenditures that would be needed to implement the Climate Compass (hereinafter referred to as "expenditure categories"): capital costs, services and supplies, salary and benefits, and incentives. This report also identifies the number of full-time equivalent staff positions (FTEs) needed to implement the Climate Compass.

Climate Compass implementation cost estimates are based on input from City departments that will be involved in implementation. These departments are Community Development, City Manager's Office, Finance, Police, and Public Works.

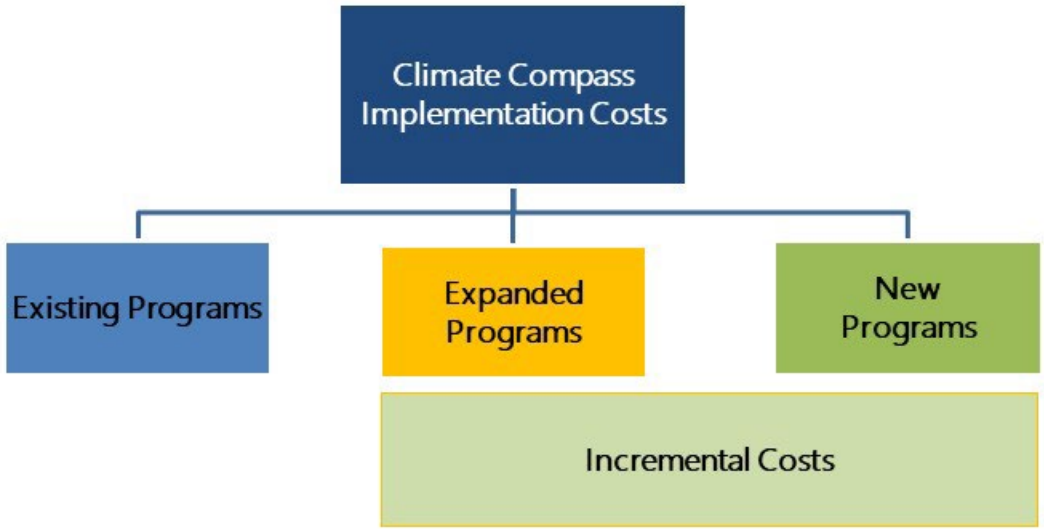
Cost estimates represent those expected to be incurred by the City to implement Climate Compass strategies and actions, which can be broken into two broad categories: community actions and City actions. Community actions are any actions that are not specific to City facilities, operations, or staff. They reflect actions that include public/private

partnerships, informational and educational campaigns, programs such as the edible food recovery program that serves the broader community, and policy changes that the City will incur costs for. City actions are actions specific to City operations such as electrification of City vehicles and facilities, employee commute surveys and carpooling, and landscaping replacement on City properties. Costs and benefits borne by Elk Grove residents and businesses are not considered in this report.

1.3 FRAMEWORK FOR ESTIMATING TOTAL AND INCREMENTAL CLIMATE COMPASS IMPLEMENTATION COSTS

This report presents total Climate Compass implementation costs based on program status, including costs of existing City programs that implement the Climate Compass and incremental Climate Compass implementation costs, which include the costs of expanded and new programs that implement the Climate Compass. Existing programs refer to Climate Compass strategies and actions that involve continuation of an adopted City plan, policy, or initiative (e.g., implementation of the Infrastructure Plan for Fleet Electrification; Bicycle, Pedestrian, and Trails Master Plan) that was in existence and operational prior to the Climate Compass and would require continued investment to reach Climate Compass implementation goals. Expanded programs refer to Climate Compass strategies and actions that involve an expansion of the scope of an existing and/or adopted City plan, policy, or initiative (e.g., tree planting, organic waste recycling, heat mitigation amenities) and the costs associated with the expansion of those programs. New programs refer to novel work efforts (e.g., weatherization programs, Climate Ambassador Program, e-bike lending program) that would need to be undertaken as a direct result of the Climate Compass and the costs associated with the development and implementation of those programs. This analytical framework for estimating Climate Compass implementation costs based on program status is depicted in Figure 1.

Figure 1 Implementation Cost Analysis Framework



Source: Prepared by Ascent in 2025.

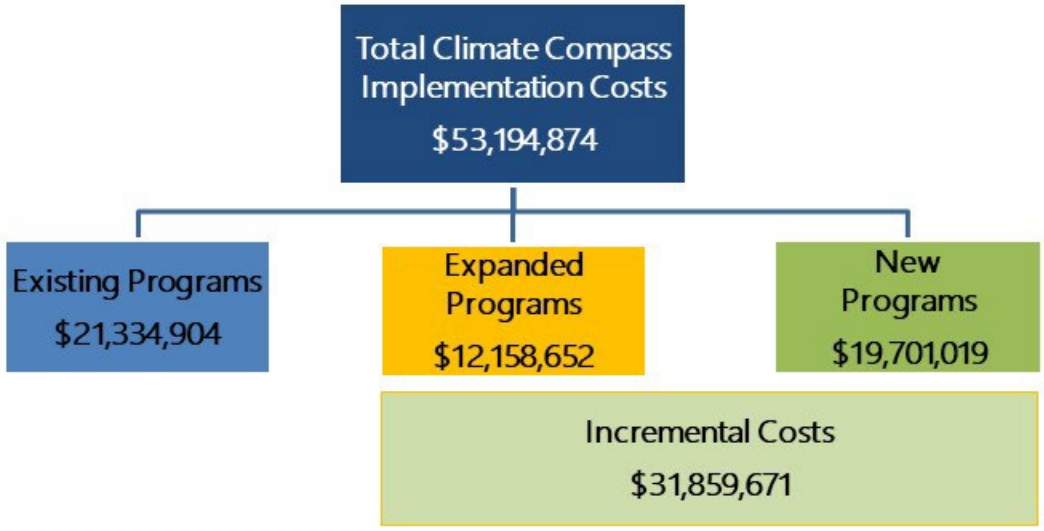
Total Climate Compass implementation costs (from existing, expanded, and new programs) and incremental Climate Compass implementation costs (from expanded and new programs) are summarized for 111 of the 113 Climate Compass actions, and by expenditure categories, expenditure types, and implementing City departments. Two of the Climate Compass actions are set to begin following FY 2029/30, beyond the scope of this cost analysis and were therefore not included in the cost analysis.

The report also identifies funding sources that could be used to pay for Climate Compass implementation costs, including the City's General Fund, Department Services Fund, and grants. This information is included as a guide and can be used to supplement departmental budget requests as part of the financial forecast and operational budget process. The underlying assumptions and limitations of this analysis are provided at the end of the report.

1.4 SUMMARY OF CLIMATE COMPASS IMPLEMENTATION COSTS AND KEY FINDINGS

Total Climate Compass implementation costs during FY 2025/26 through FY 2029/30 are estimated to be $53 million, with $21 million (40 percent) of total implementation costs associated with existing City programs. The remaining $32 million (60 percent) of total implementation costs are incremental costs associated with the expansion of existing City programs ($12 million) and new City programs ($20 million) that would directly result from draft Climate Compass actions. A summary of Climate Compass implementation costs by program status is provided in Figure 2 and Table 1.

Figure 2 Summary of Climate Compass Implementation Costs by Program Status (FY 2025/26 through FY 2029/30)



Source: Analysis conducted by Ascent in 2025.

Table 1 Summary of Climate Compass Implementation Costs by Community and City Actions, Program Status, and Fiscal Year (FY 2025/26 through FY 2029/30)

Action Type and Status	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
COEG	**$663,895**	**$3,424,294**	**$4,897,654**	**$4,775,418**	**$5,206,127**	**$18,967,388**
Funded [existing]	$193,395	$285,369	$189,910	$206,454	$218,716	$1,093,844
Unfunded [expanded]	$263,000	$1,915,800	$3,050,087	$3,168,908	$3,573,490	$11,971,286
Unfunded [new]	$207,500	$1,223,125	$1,657,656	$1,400,056	$1,413,920	$5,902,258
Community	**$5,024,982**	**$5,920,215**	**$5,544,194**	**$8,980,967**	**$8,756,825**	**$34,227,186**
Funded [existing]	$3,877,482	$3,932,314	$3,918,367	$4,242,630	$4,270,266	$20,241,060
Unfunded [expanded]	$15,000	$41,200	$42,436	$43,709	$45,020	$187,365
Unfunded [new]	$1,132,500	$1,946,700	$1,583,393	$4,694,628	$4,441,539	$13,798,761
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,950**	**$13,756,385**	**$13,962,952**	**$53,194,874**

Notes: Totals may not sum exactly due to independent rounding. COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

Overall findings from the analysis show:

- **Total Climate Compass implementation costs increase steadily over the five-year period**. The total estimated cost to implement Climate Compass actions over the first five years including adoption year is $52 million. 64 percent of these costs ($34 million) are associated with community actions. Table 1 shows that annual implementation costs increase from $6 million in FY 2025/26 to $14 million in FY 2029/30.
- **Expanded and new programs account for a significant portion of Climate Compass implementation costs**. The total estimated costs for expanded and new actions, which would not have occurred without Climate Compass adoption, is $32 million over the first five years after adoption. $14 million (44 percent) of these costs are associated with community actions and $18 million (56 percent) are associated with City actions. Total annual implementation costs for expanded and new programs increase from $2 million in FY 2025/26 to $9 million in FY 2029/30, as displayed in Table 1. Actions with the highest incremental Climate Compass implementation costs include:
  - Action BF-2.2 ($5 million) to install solar and battery storage on City buildings and facilities,
  - Action RC-3.1 ($8 million) to increase recycled water in the city,
  - Action TR-1.1 ($17 million) to implement the Bicycle, Pedestrian, and Trails Master Plan.
- **Existing Climate Compass implementation costs are comparatively low**. Costs associated with existing actions are $21 million. The majority of these costs are associated with community actions ($20 million or 95 percent). Annual costs for existing actions are about $4 million in each of the five fiscal years of this cost analysis, as displayed in Table 1. The existing actions with the highest Climate Compass implementation cost is action RA-4.2 ($557,000) to develop and implement a cool pavement "roadmap" to expand the use of cool pavement across the city. The City has already received a Caltrans planning grant to initiate this work.
- **Current staffing levels are sufficient to cover most of the Climate Compass implementation activities**. The total staffing needed to implement the Climate Compass is estimated to be 26 FTE positions, all of which are existing staff positions.

2 CLIMATE COMPASS IMPLEMENTATION COST ANALYSIS METHODOLOGY

The following sections summarize the process used to estimate Climate Compass implementation costs based on input and discussions with the City departments responsible for Climate Compass implementation. The costs are based on the best available information and will help each of these departments develop annual budgets in the future. Through the regular monitoring, reporting, and updating efforts of the City's operational plan, departments can reassess costs presented in this document and adjust accordingly to keep on track with stated Climate Compass implementation goals and remain in sync with the City's budgetary process.

2.1 PROCESS TO ESTIMATE CLIMATE COMPASS IMPLEMENTATION COSTS

Climate Compass implementation cost estimates were developed through the following steps:

(1) determine the tasks required to implement Climate Compass strategies and actions;

(2) define workload associated with these tasks;

(3) determine whether existing staffing and other resources are sufficient;

(4) determine the additional staffing level and other resources that might be required; and

(5) complete quality control and data validation.

2.1.1 Identify Categories to Implement Climate Compass Strategies and Actions

The first step identified tasks that adequately represent the expected workload to implement Climate Compass strategies and actions. To better understand the potential workload and more accurately estimate associated costs, preliminary categories were identified to classify each Climate Compass action that would need to be taken to implement each City initiative, requirement, or incentive outlined under each Climate Compass action. These categories include policy, program development outreach/coordination, plan development, incentive programs, infrastructure, and others.

2.1.2 Establish Cost Estimates

Once categories were identified, Climate Compass implementation costs were estimated for capital, services and supplies, salary and benefits, and incentive expenditures. To facilitate and standardize collection of implementation cost data, a data collection template was created. Quality control and data validation occurred at several stages. Initial review occurred after total estimated costs were provided for each action/department. Upon subsequent review of cost estimates by City staff, some cost components were updated to create consistency across all departments and to ensure a complete data set.

Estimates reflect the costs of Climate Compass implementation, based on reasonable assumptions of the required work effort. All costs results presented in this report include a set inflation rate (3 percent), year over year. The implementation costs presented herein are subject to change and would need to be revisited and potentially adjusted as the Climate Compass is implemented, as described above.

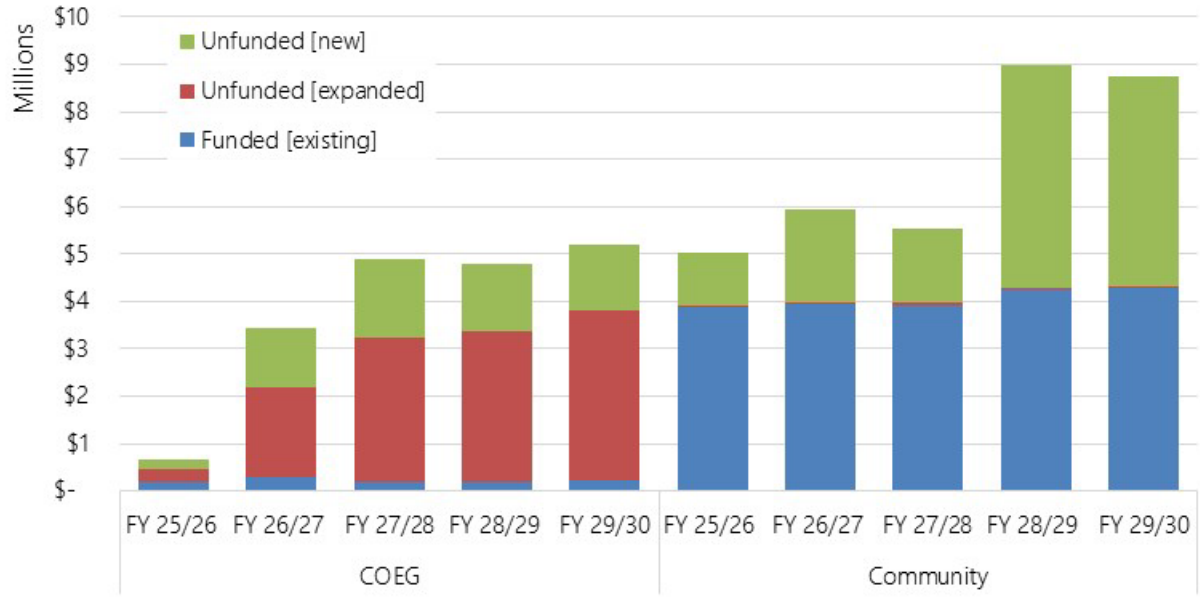
3 CLIMATE COMPASS IMPLEMENTATION COST RESULTS

This section summarizes Climate Compass implementation cost analysis results. Costs are evaluated by Climate Compass actions, department, expenditure category, and focus area (i.e., Buildings and Energy, Buildings and Facilities, Climate Action Commitment, Fleet and Employee Commute, Green Economy, Resilience, Resilience and Adaptation, Resource Consumption, Solid Waste and Water, and Transportation). Each subsection uses the evaluation framework described in Section 1.3 and presents total Climate Compass costs, and incremental costs. All of the cost results presented in this report include a set inflation rate (3 percent), year over year.

3.1 TOTAL CLIMATE COMPASS IMPLEMENTATION COSTS

Figure 3 illustrates the total estimated implementation costs from FY 2025/26 through FY 2029/30. Estimated annual total Climate Compass implementation costs increase from about $6 million in FY 2025/26 to $14 million in FY 2029/30. Total Climate Compass implementation costs are projected to be $53 million over the five-year period. 64 percent of these total costs ($34 million) are associated with community actions. Existing programs account for about $21 million or 40 percent of total implementation costs. New and expanded programs representing new costs or investments as a result of the Climate Compass account for about $32 million, or 60 percent of total implementation costs. This represents the incremental cost to the City for implementing the Climate Compass.

Figure 3 Total Climate Compass Implementation Cost by Action Status FY 2025/26 through FY 2029/30



Notes: COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

3.2 COSTS BY CLIMATE COMPASS ACTION

This section summarizes the total estimated costs to implement the actions of the Climate Compass including the costs associated with coordination, monitoring, and reporting on Climate Compass implementation progress.

3.2.1 Total Cost by Climate Compass Action

Table 2 shows total estimated annual implementation cost by Climate Compass action. A selection of City and community Climate Compass action highlights is presented below:

- Action BF-2.2, which aims to install solar and battery storage systems on City buildings and facilities, has the highest cost ($5 million) in the Buildings and Facilities focus area and is the highest of all City action costs. Action BF-2.3, which seeks to procure renewable diesel fuel for use in diesel-powered generators, is estimated to cost about $3 million in replacement costs.
- Action FEC-2.1 has the highest cost in the Fleet and Employee Commute focus area, at $3 million, to implement the City Infrastructure Plan for Fleet Electrification to transition the City's vehicle fleet to zero-emission vehicles.
- Action RS-1.5 has the highest cost in the Resilience focus area, at $2 million, to install cool pavement and permeable pavement on all City parking lots to reduce urban heat island effect.
- Action WW-1.1 has the highest cost in the Solid Waste and Water focus area, at $2 million, to develop and implement a plan to replace water-intensive landscaping at City facilities and parks with native and drought tolerant plans and/or permeable hardscaping.
- Action BE-1.2 has the highest cost in the Buildings and Energy focus area, at $415,000, to increase the allowed density of development along the city's major transit corridors.
- Action CA-1.1 has the highest cost in the Climate Action Commitment focus area, at $85,000, to implement the Climate Ambassador Program to recruit and train volunteers to serve as local sustainability champions and educators.
- Action GE-1.2 has the highest cost in the Green Economy focus area, at $179,000, to attract and retain green industry and sustainable businesses.
- Action RA-4.3 has the highest cost in the Resilience and Adaptation focus area, at $622,000, to incentivize residential and nonresidential building owners to retrofit existing buildings with cool roofs or green roofs.
- Action RC-3.1 has the highest cost in the Resource Consumption focus area, at $8 million, to expand the use of recycled water.
- Action TR-1.1 in the Transportation focus area has the highest cost of all Climate Compass actions at $17 million or 32 percent of total costs. It aims to implement the Bicycle, Pedestrian, and Trails Master Plan including infrastructure improvements such as 15 new sidewalk miles and 30 new bike lane miles over the next five fiscal years.
- Actions WW-1.2 and TR-3.3 are set to begin following FY 2029/30, beyond the scope of this cost analysis and therefore do not have associated costs in the first five fiscal years of this cost analysis.
- Action CA-4.4 in the Climate Action and Commitment focus area notably has no costs. This action is to establish a dedicated Climate Action Coordinator position within the City to lead climate, resilience, and sustainability initiatives across the City. This position exists already and the job responsibilities associated with the position are reflected across the other Climate Compass actions and their respective costs.

Table 2 Total Climate Compass Implementation Costs by Action FY 2025/26 through FY 2029/30

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
COEG	**$663,895**	**$3,424,294**	**$4,897,654**	**$4,775,418**	**$5,206,127**	**$18,967,388**
Buildings and Facilities	**$236,603**	**$1,546,312**	**$2,752,369**	**$2,554,406**	**$2,602,900**	**$9,692,591**
BF-1.1	$16,196	$0	$0	$0	$0	**$16,196**
BF-1.2	$206,389	$109,581	$106,090	$0	$0	**$422,060**
BF-1.3	$0.00	$105,019	$108,169	$0	$0	**$213,188**
BF-2.1	$2,066	$2,128	$2,191	$2,257	$2,325	**$10,967**
BF-2.2	$0	$1,299,288	$1,338,267	$1,378,415	$1,419,767	**$5,435,738**
BF-2.3	$0	$0	$1,074,722	$1,106,963	$1,140,172	**$3,321,858**
BF-3.1	$0	$17,986	$5,059	$0	$0	**$23,045**
BF-3.2	$0	$0	$117,870	$66,770	$40,636	**$225,276**
BF-3.3	$6,389	$6,581	$0	$0	$0	**$12,970**
BF-3.4	$5,563	$5,730	$0	$0	$0	**$11,293**
Fleet and Employee Commute	**$365,569**	**$1,153,970**	**$903,501**	**$947,518**	**$1,291,527**	**$4,662,085**
FEC-1.1	$5,392	$0	$5,720	$0	$6,069	**$17,181**
FEC-1.2	$0	$11,070	$11,402	$11,744	$12,097	**$46,314**
FEC-1.3	$7,498	$127,236	$131,053	$134,985	$139,034	**$539,807**
FEC-1.4	$8,875	$20,241	$20,849	$21,474	$22,118	**$93,558**
FEC-1.5	$16,792	$46,109	$0	$0	$0	**$62,900**
FEC-1.6	$8,739	$9,002	$9,272	$9,550	$9,836	**$46,399**
FEC-1.7	$11,848	$7,714	$7,945	$8,184	$8,429	**$44,121**
FEC-1.8	$0	$263,936	$31,168	$32,103	$33,066	**$360,272**
FEC-2.1	$284,707	$650,658	$686,091	$729,478	$1,060,877	**$3,411,812**
FEC-2.2	$21,717	$18,004	$0	$0	$0	**$39,721**
Resilience	**$44,057**	**$86,856**	**$622,268**	**$640,937**	**$660,165**	**$2,054,283**
RS-1.1	$5,563	$5,730	$0	$0	$0	**$11,293**
RS-1.2	$5,563	$5,730	$0	$0	$0	**$11,293**
RS-1.3	$5,563	$5,730	$0	$0	$0	**$11,293**
RS-1.4	$21,805	$0	$0	$0	$0	**$21,805**
RS-1.5	$0	$0	$556,414	$573,106	$590,299	**$1,719,820**
RS-1.6	$0	$63,937	$65,855	$67,830	$69,865	**$267,487**
RS-1.7	$5,563	$5,730	$0	$0	$0	**$11,293**
Solid Waste and Water	**$17,666**	**$637,1555**	**$619,515**	**$632,558**	**$651,535**	**$2,558,430**
WW-1.1	$0	$581,284	$596,419	$566,505	$583,500	**$2,327,709**
WW-1.2	$0	$0	$0	$0	$0	$0
WW-1.3	$0	$0	$12,912	$13,299	$13,698	**$39,908**
WW-2.1	$0	$10,974	$0	$0	$0	**$10,974**
WW-2.2	$17,666	$7,962	$8,200	$8,447	$8,700	**$50,975**
WW-2.3	$0	$36,936	$1,984	$2,043	$2,104	**$43,067**
WW-2.4	$0	$0	$0	$42,265	$43,533	**$85,797**

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
Community	**$5,024,982**	**$5,920,215**	**$5,544,194**	**$8,980,967**	**$8,756,825**	**$34,227,186**
Buildings and Energy	$349,050	$399,099	$256,664	$139,104	$143,277	**$1,287,194**
BE-1.1	$160,710	$72,230	$0	$0	$0	**$232,940**
BE-1.2	$100,791	$203,066	$111,629	$0	$0	**$415,486**
BE-1.3	$0	$4,325	$57,499	$113,861	$117,276	**$292,961**
BE-1.4	$6,347	$6,537	$0	$0	$0	**$12,883**
BE-1.5	$74,030	$35,344	$0	$0	$0	**$109,373**
BE-2.1	$0	$49,453	$50,936	$0	$0	**$100,389**
BE-3.1	$7,173	$7,388	$7,610	$7,838	$8,073	**$38,082**
BE-3.2	$0	$0	$7,610	$7,838	$8,073	**$23,521**
BE-4.1	$0	$15,144	$15,598	$0	$0	**$30,742**
BE-4.2	$0	$0	$0	$3,612	$3,720	**$7,332**
BE-4.3	$0	$5,614	$5,782	$5,956	$6,134	**$23,486**
Climate Action Commitment	**$111,272**	**$148,917**	**$184,296**	**$180,796**	**$181,570**	**$806,850**
CA-1.1	$24,460	$14,555	$14,992	$15,442	$15,905	**$85,354**
CA-1.2	$0	$0	$28,141	$19,956	$15,905	**$64,002**
CA-1.3	$12,173	$12,538	$12,914	$13,302	$13,701	**$64,627**
CA-1.4	$12,173	$12,538	$12,914	$13,302	$13,701	**$64,627**
CA-1.5	$12,173	$12,538	$12,914	$13,302	$13,701	**$64,627**
CA-2.1	$0	$7,939	$6,741	$6,943	$7,151	**$28,774**
CA-2.2	$11,839	$8,247	$8,494	$8,749	$9,011	**$46,339**
CA-2.3	$0	$0	$11,879	$12,235	$12,602	**$36,717**
CA-2.4	$0	$17,716	$10,575	$10,893	$11,219	**$50,403**
CA-2.5	$11,197	$11,533	$11,879	$12,235	$12,602	**$59,447**
CA-3.1	$5,000	$9,405	$9,687	$9,978	$10,277	**$44,348**
CA-3.2	$8,384	$8,636	$8,895	$9,162	$9,437	**$44,514**
CA-4.1	$5,904	$6,081	$6,263	$6,451	$6,644	**$31,343**
CA-4.2	$7,969	$8,208	$8,455	$8,708	$8,969	**$42,310**
CA-4.3	$0	$18,983	$19,552	$20,139	$20,743	**$79,416**
CA-4.4	$0	$0	$0	$0	$0	**$0**
Green Economy	**$28,819**	**$49,348**	**$61,725**	**$55,502**	**$57,167**	**$252,561**
GE-1.1	$0	$6,700	$3,450	$3,554	$3,660	**$17,364**
GE-1.2	$28,819	$35,949	$37,027	$38,138	$39,282	**$179,214**
GE-1.3	$0	$6,700	$6,901	$7,108	$7,321	**$28,028**
GE-1.4	$0	$0	$14,348	$6,7023	$6,904	**$27,954**
Resilience and Adaptation	**$746,043**	**$401,196**	**$324,753**	**$685,093**	**$473,314**	**$2,630,399**
RA-1.1	$0	$0	$0	$98,660	$49,441	**$148,101**
RA-1.2	$0	$0	$0	$12,386	$12,757	**$25,143**
RA-2.1	$2,215	$2,282	$2,350	$2,421	$2,493	**$11,761**
RA-2.2	$5,594	$5,762	$5,934	$6,113	$6,296	**$29,698**
RA-3.1	$6,335	$6,525	$6,721	$6,922	$7,130	**$33,632**

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
RA-3.2	$0	$21,876	$0	$0	$0	**$21,876**
RA-4.1	$0	$0	$131,505	$135,450	$0	**$266,954**
RA-4.2	$401,582	$156,129	$0	$0	$0	**$557,711**
RA-4.3	$0	$0	$0	$321,727	$300,482	**$622,209**
RA-4.4	$7,422	$7,644	$0	$0	$0	**$15,066**
RA-4.5	$0	$6,019	$6,200	$6,386	$6,577	**$25,181**
RA-5.1	$0	$0	$0	$43,260	$34,816	**$78,077**
RA-5.2	$321,134	$0	$0	$0	$0	**$321,134**
RA-5.3	$0	$2,902	$747	$770	$793	**$5,213**
RA-5.4	$0	$23,982	$24,702	$0	$0	**$48,684**
RA-5.5	$1,761	$1,814	$1,868	$1,925	$1,982	**$9,350**
RA-6.1	$0	$0	$0	$12,235	$12,602	**$24,838**
RA-6.2	$0	$47,751	$22,661	$0	$0	**$70,413**
RA-6.3	$0	$0	$0	$36,840	$37,945	**$74,784**
RA-6.4	$0	$118,509	$122,065	$0	$0	**$240,574**
Resource Consumption	**$200,649**	**$259,556**	**$98,771**	**$4,116,687**	**$3,983,599**	**$8,659,261**
RC-1.1	$0	$37,535	$38,661	$39,821	$41,016	**$157,034**
RC-1.2	$0	$0	$0	$69,377	$11,184	**$80,561**
RC-1.3	$30,396	$31,308	$32,247	$33,215	$34,211	**$161,376**
RC-2.1	$9,527	$9,813	$10,107	$10,410	$10,723	**$50,580**
RC-2.2	$0	$15,352	$3,866	$3,982	$4,102	**$27,302**
RC-2.3	$552	$569	$586	$604	$622	**$2,932**
RC-2.4	$147,634	$152,064	$0	$0	$0	**$299,698**
RC-3.1	$0	$0	$0	$3,945,576	$3,782,566	**$7,728,142**
RC-3.2	$9,391	$9,673	$9,963	$10,262	$10,570	**$49,858**
RC-3.3	$0	$0	$0	$0	$85,063	**$85,063**
RC-3.4	$3,148	$3,243	$3,340	$3,440	$3,544	**$16,715**
Transportation	**$3,589,149**	**$4,662,100**	**$4,617,987**	**$3,803,785**	**$3,917,899**	**$20,590,921**
TR-1.1	$3,213,677	$3,310,088	$3,276,778	$3,375,081	$3,476,333	$16,651,957
TR-1.2	$282,436	$290,909	$299,637	$308,626	$317,885	**$1,499,493**
TR-1.3	$0	$27,350	$5,951	$6,129	$6,313	**$45,743**
TR-1.4	$6,749	$58,451	$60,205	$62,011	$63,871	**$251,288**
TR-1.5	$3,739	$3,852	$3,967	$4,086	$4,209	**$19,853**
TR-1.6	$0	$6,486	$6,680	$6,881	$7,087	**$27,133**
TR-1.7	$7,479	$12,853	$13,239	$13,636	$14,045	**$61,252**
TR-1.8	$0	$785,122	$808,676	$0	$0	**$1,593,798**
TR-2.1	$52,470	$28,294	$0	$0	$0	**$80,765**
TR-2.2	$0	$112,126	$115,490	$0	$0	**$227,617**
TR-2.3	$7,322	$5,778	$5,952	$6,130	$6,314	**$31,496**
TR-2.4	$0	$19,088	$19,660	$0	$0	**$38,748**
TR-2.5	$1,653	$1,702	$1,753	$1,806	$1,860	**$8,774**

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
TR-3.1	$13,624	$0	$0	$0	$0	**$13,624**
TR-3.2	$0	$0	$0	$19,400	$19,982	**$39,381**
TR-3.3	$0	$0	$0	$0	$0	**$0**
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,950**	**$13,756,385**	**$13,962,952**	**$53,194,874**

Notes: Totals may not sum exactly due to independent rounding. COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

3.2.2 Climate Compass Action Costs by Program Status

Table 3 shows the Climate Compass action costs by their program status for existing, expanded, and new programs to implement Climate Compass actions. Actions with the highest incremental Climate Compass implementation costs (i.e., expanded and new programs) include:

- Action BF-2.2 (i.e., solar and battery storage installations): $5 million of incremental costs.
- Action RC-3.1 (i.e., recycled water): $7 million of incremental costs.
- Action TR-1.1 (i.e., Bicycle, Pedestrian, and Trails Master Plan implementation): $16 million of incremental costs.

Table 3 Climate Compass Implementation Costs by Program Status by Fiscal Year

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
Existing	**$652,791**	**$442,895**	**$307,037**	**$426,874**	**$445,748**	**$2,275,345**
Buildings and Energy	**$7,173**	**$7,388**	**$7,610**	**$7,838**	**$8,073**	**$38,082**
BE-3.1	$7,173	$7,388	$7,610	$7,838	$8,073	$38,082
Buildings and Facilities	**$2,066**	**$13,916**	**$28,155**	**$29,000**	**$29,870**	**$103,007**
BF-2.1	$2,066	$2,128	$2,191	$2,257	$2,325	$10,967
BF-2.2	$0	$11,788	$12,142	$12,506	$12,881	$49,318
BF-2.3	$0	$0	$13,822	$14,236	$14,664	$42,722
Climate Action Commitment	**$35,391**	**$36,453**	**$37,547**	**$38,673**	**$39,833**	**$187,897**
CA-1.3	$7,173	$7,388	$7,610	$7,838	$8,073	$38,082
CA-1.4	$7,173	$7,388	$7,610	$7,838	$8,073	$38,082
CA-1.5	$7,173	$7,388	$7,610	$7,838	$8,073	$38,082
CA-4.1	$5,904	$6,081	$6,263	$6,451	$6,644	$31,343
CA-4.2	$7,969	$8,208	$8,455	$8,708	$8,969	$42,310
Fleet and Employee Commute	**$27,099**	**$22,358**	**$28,749**	**$19,205**	**$25,850**	**$123,262**
FEC-1.1	$5,392	$0	$5,720	$0	$6,069	$17,181
FEC-2.1	$21,707	$22,358	$23,029	$19,205	$19,781	$106,081
Resilience and Adaptation	**$437,493**	**$177,368**	**$14,003**	**$14,423**	**$14,855**	**$658,142**
RA-2.2	$5,594	$5,762	$5,934	$6,1123	$6,296	$29,698
RA-4.2	$401,582	$156,129	$0	$0	$0	$557,711
RA-4.4	$7,422	$7,644	$0	$0	$0	$15,066
RA-4.5	$0	$6,019	$6,200	$6,386	$6,577	$25,181
RA-5.2	$21,134	$0	$0	$0	$0	$21,134
RA-5.5	$1,761	$1,814	$1,868	$1,925	$1,982	$9,350

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
Resource Consumption	**$38,015**	**$76,690**	**$78,991**	**$202,392**	**$208,464**	**$604,552**
RC-1.1	$0	$37,535	$38,661	$39,821	$41,016	$157,034
RC-1.3	$25,396	$26,158	$26,943	$27,751	$28,583	$134,831
RC-2.1	$4,527	$4,663	$4,803	$4,947	$5,095	$24,034
RC-2.3	$552	$569	$586	$604	$622	$2,932
RC-3.1	$0	$0	$0	$121,032	$124,662	$245,694
RC-3.2	$4,391	$4,523	$4,658	$4,798	$4,942	$23,312
RC-3.4	$3,148	$3,243	$3,340	$3,440	$3,544	$16,715
Transportation	**$105,555**	**$108,721**	**$111,983**	**$115,342**	**$118,803**	**$560,403**
TR-1.1	$70,977	$73,107	$75,300	$77,559	$79,885	$376,828
TR-1.2	$22,436	$23,109	$23,803	$24,517	$25,252	$119,118
TR-1.4	$6,749	$6,951	$7,160	$7,375	$7,596	$35,831
TR-1.5	$3,739	$3,852	$3,967	$4,086	$4,209	$19,853
TR-2.5	$1,653	$1,702	$1,753	$1,806	$1,860	$8,774
Expanded	**$596,739**	**$1,977,436**	**$3,111,331**	**$3,206,546**	**$3,612,257**	**$12,504,310**
Buildings and Facilities	**$0**	**$1,287,500**	**$2,387,025**	**$2,458,636**	**$2,532,395**	**$8,665,556**
BF-2.2	$0	$1,287,500	$1,326,125	$1,365,909	$1,406,886	$5,386,420
BF-2.3	$0	$0	$1,060,900	$1,092,727	$1,125,509	$3,279,136
Climate Action Commitment	**$15,000**	**$15,450**	**$15,913**	**$16,391**	**$16,883**	**$79,637**
CA-1.3	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
CA-1.4	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
CA-1.5	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
Fleet and Employee Commute	**$266,739**	**$632,152**	**$667,030**	**$714,359**	**$1,045,304**	**$3,325,584**
FEC-1.6	$3,739	$3,852	$3,967	$4,086	$4,209	$19,853
FEC-2.1	$263,000	$628,300	$663,062	$710,273	$1,041,096	$3,305,731
Resilience and Adaptation	**$300,000**	**$26,885**	**$25,449**	**$770**	**$793**	**$353,896**
RA-5.2	$300,000	$0	$0	$0	$0	$300,000
RA-5.3	$0	$2,902	$747	$770	$793	$5,213
RA-5.4	$0	$23,982	$24,702	$0	$0	$48,684
Resource Consumption	**$15,000**	**$15,450**	**$15,913**	**$16,391**	**$16,883**	**$79,637**
RC-1.3	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
RC-2.1	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
RC-3.2	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
New	**$4,439,347**	**$6,924,178**	**$7,023,482**	**$10,122,966**	**$9,904,947**	**$38,414,919**
Buildings and Energy	**$341,877**	**$391,711**	**$249,055**	**$131,266**	**$135,204**	**$1,249,112**
BE-1.1	$160,710	$72,230	$0	$0	$0	$232,940
BE-1.2	$100,791	$203,066	$111,629	$0	$0	$415,486
BE-1.3	$0	$4,325	$57,499	$113,861	$117,276	$292,961
BE-1.4	$6,347	$6,537	$0	$0	$0	$12,883
BE-1.5	$74,030	$35,344	$0	$0	$0	$109,373
BE-2.1	$0	$49,453	$50,936	$0	$0	$100,389

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
BE-3.2	$0	$0	$7,610	$7,838	$8,073	$23,521
BE-4.1	$0	$15,144	$15,598	$0	$0	$30,742
BE-4.2	$0	$0	$0	$3,612	$3,720	$7,332
BE-4.3	$0	$5,614	$5,782	$5,956	$6,134	$23,486
Buildings and Facilities	**$234,538**	**$244,896**	**$337,189**	**$66,770**	**$40,636**	**$924,029**
BF-1.1	$16,196	$0	$0	$0	$0.	$16,196
BF-1.2	$206,389	$109,581	$106,090	$0	$0	$422,060
BF-1.3	$0	$105,019	$108,169	$0	$0	$213,188
BF-3.1	$0	$17,986	$5,059	$0	$0	$23,045
BF-3.2	$0	$0	$117,870	$66,770	$40,636	$225,276
BF-3.3	$6,389	$6,581	$0	$0	$0	$12,970
BF-3.4	$5,563	$5,730	$0	$0	$0	$11,293
Climate Action Commitment	**$60,880**	**$97,014**	**$130,836**	**$125,732**	**$124,854**	**$539,316**
CA-1.1	$24,460	$14,555	$14,992	$15,442	$15,905	$85,354
CA-1.2	$0	$0	$28,141	$19,956	$15,905	$64,002
CA-2.1	$0	$7,939	$6,741	$6,943	$7,151	$28,774
CA-2.2	$11,839	$8,247	$8,494	$8,749	$9,011	$46,339
CA-2.3	$0	$0	$11,879	$12,235	$12,602	$36,717
CA-2.4	$0	$17,716	$10,575	$10,893	$11,219	$50,403
CA-2.5	$11,197	$11,533	$11,879	$12,235	$12,602	$59,447
CA-3.1	$5,000	$9,405	$9,687	$9,978	$10,277	$44,348
CA-3.2	$8,384	$8,636	$8,895	$9,162	$9,437	$44,514
CA-4.3	$0	$18,983	$19,552	$20,139	$20,743	$79,416
CA-4.4	$0	$0	$0	$0	$0	$0
Fleet and Employee Commute	**$71,730**	**$499,461**	**$207,722**	**$213,954**	**$220,372**	**$1,213,239**
FEC-1.2	$0	$11,070	$11,402	$11,744	$12,097	$46,314
FEC-1.3	$7,498	$127,236	$131,053	$134,985	$139,034	$539,807
FEC-1.4	$8,875	$20,241	$20,849	$21,474	$22,118	$93,558
FEC-1.5	$16,792	$46,109	$0	$0	$0	$62,900
FEC-1.6	$5,000	$5,150	$5,304	$5,464	$5,628	$26,546
FEC-1.7	$11,848	$7,714	$7,945	$8,184	$8,429	$44,121
FEC-1.8	$0	$263,936	$31,168	$32,1023	$33,066	$360,272
FEC-2.2	$21,717	$18,004	$0	$0	$0	$39,721
Green Economy	**$28,819**	**$49,348**	**$61,725**	**$55,502**	**$57,167**	**$252,561**
GE-1.1	$0	$6,700	$3,450	$3,554	$3,660	$17,364
GE-1.2	$28,819	$35,949	$37,027	$38,138	$39,282	$179,214
GE-1.3	$0	$6,700	$6,901	$7,108	$7,321	$28,028
GE-1.4	$0	$0	$14,348	$6,703	$6,904	$27,954

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
Resilience	**$44,057**	**$86,856**	**$622,268**	**$640,937**	**$660,165**	**$2,054,283**
RS-1.1	$5,563	$5,730	$0	$0	$0	$11,293
RS-1.2	$5,563	$5,730	$0	$0	$0	$11,293
RS-1.3	$5,563	$5,730	$0	$0	$0	$11,293
RS-1.4	$21,805	$0	$0	$0	$0	$21,805
RS-1.5	$0	$0	$556,414	$573,106	$590,299	$1,719,830
RS-1.6	$0	$63,937	$65,855	$67,830	$69,865	$267,487
RS-1.7	$5,563	$5,730	$0	$0	$0	$11,293
Resilience and Adaptation	**$8,550**	**$196,943**	**$285,301**	**$669,901**	**$457,666**	**$1,618,361**
RA-1.1	$0	$0	$0	$98,660	$49,441	$148,101
RA-1.2	$0	$0	$0	$12,386	$12,757	$25,143
RA-2.1	$2,215	$2,282	$2,350	$2,421	$2,493	$11,761
RA-3.1	$6,335	$6,525	$6,721	$6,922	$7,130	$33,632
RA-3.2	$0	$21,876	$0	$0	$0	$21,876
RA-4.1	$0	$0	$131,505	$135,450	$0	$266,954
RA-4.3	$0	$0	$0	$321,727	$300,482	$622,209
RA-5.1	$0	$0	$0	$43,260	$34,816	$78,077
RA-6.1	$0	$0	$0	$12,235	$12,602	$24,838
RA-6.2	$0	$47,751	$22,661	$0	$0	$70,413
RA-6.3	$0	$0	$0	$36,840	$37,945	$74,784
RA-6.4	$0	$118,509	$122,065	$0	$0	$240,574
Resource Consumption	**$147,634**	**$167,415**	**$3,866**	**$3,897,904**	**$3,758,252**	**$7,975,072**
RC-1.2	$0	$0	$0	$69,377	$11,184	$80,561
RC-2.2	$0	$15,352	$3,866	$3,982	$4,102	$27,302
RC-2.4	$147,634	$152,064	$0	$0	$0	$299,698
RC-3.1	$0	$0	$0	$3,824,544	$3,657,904	$7,482,448
RC-3.3	$0	$0	$0	$0	$85,063	$85,063
Solid Waste and Water	**$17,666**	**$637,155**	**$619,515**	**$632,558**	**$651,535**	**$2,558,430**
WW-1.1	$0	$581,284	$596,419	$566,505	$583,500	$2,327,709
WW-1.3	$0	$0	$12,912	$13,299	$13,698	$39,909
WW-2.1	$0	$10,974	$0	$0	$0	$10,974
WW-2.2	$17,666	$7,962	$8,200	$8,447	$8,700	$50,975
WW-2.3	$0	$36,936	$1,984	$2,043	$2,104	$43,067
WW-2.4	$0	$0	$0	$42,265	$43,533	$85,797
Transportation	**$3,483,595**	**$4,553,378**	**$4,506,005**	**$3,688,443**	**$3,799,096**	**$20,030,517**
TR-1.1	$3,142,700	$3,236,981	$3,201,478	$3,297,522	$3,396,448	$16,275,129
TR-1.2	$260,000	$267,800	$275,834	$284,109	$292,632	$1,380,375
TR-1.3	$0	$27,350	$5,951	$6,129	$6,313	$45,743
TR-1.4	$0	$51,500	$53,045	$54,636	$56,275	$215,457
TR-1.6	$0	$6,486	$6,680	$6,881	$7,087	$27,133
TR-1.7	$7,479	$12,853	$13,239	$13,636	$14,045	$61,252

Action	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
TR-1.8	$0	$785,122	$808,676	$0	$0	$1,593,798
TR-2.1	$52,470	$28,294	$0	$0	$0	$80,765
TR-2.2	$0	$112,126	$115,490	$0	$0	$227,617
TR-2.3	$7,322	$5,778	$5,952	$6,130	$6,314	$31,496
TR-2.4	$0	$19,088	$19,660	$0	$0	$38,748
TR-3.1	$13,624	$0	$0	$0	$0	$13,624
TR-3.2	$0	$0	$0	$19,400	$19,982	$39,381
Grand Total	**$5,692,741**	**$9,348,489**	**$10,445,949**	**$13,760,607**	**$13,967,301**	**$53,215,088**

Notes: Totals may not sum exactly due to independent rounding. COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

3.3 COSTS BY EXPENDITURE CATEGORY

City expenditure categories include capital, salary and benefits, services and supplies, and incentives. Figure 4 displays the total distribution of the four expenditure types across the five fiscal years.

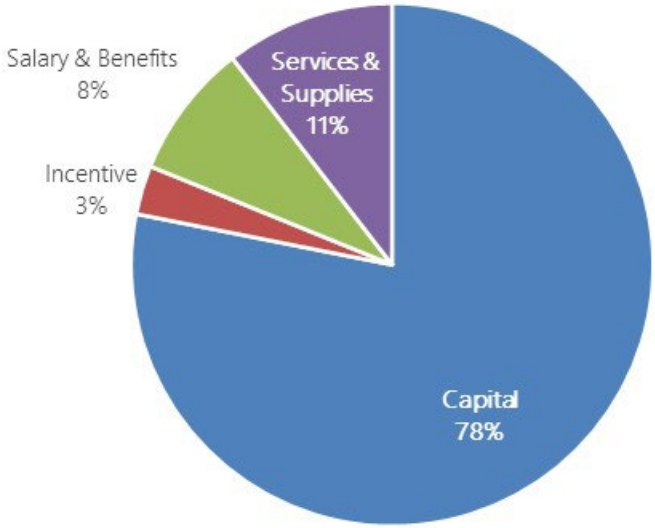
Capital: The capital category represents about 78 percent of total costs over the analysis period. Examples of capital expenditures could include construction of bicycle lanes and sidewalks, purchase of e-bikes, and purchase and installation of solar and battery storage systems.

Services and Supplies: The services and supplies category, which accounts for 11 percent of costs, is comprised of consultants, other services such as capital design, materials, permitting fees, and supplies (e.g., education and outreach materials) needed to implement Climate Compass actions. Examples of implementation costs in this category include support to develop Climate Compass-related ordinances, CEQA-related activities, stewardship of land, and a landscape assessment.

Salary and Benefits: The salary and benefits category represents the City personnel costs associated with Climate Compass implementation. This category represents about 8 percent of total costs over the five years. Salary and benefit costs include current base salary, benefits like health insurance and retirement, and overhead costs associated with fixed expenses such as equipment and supplies allocated to each City employee.

Incentives: The incentives category represents about 3 percent of total costs over five fiscal years. Incentives can include revolving loan funds, grant programs, subsidies, or other tools used by the City to promote investment and support implementation or adoption of programs.

Figure 4 Distribution of Expenditure Types



Source: Analysis conducted by Ascent in 2025.

3.3.1 Total Costs by Expenditure Category

Table 4 and Figure 5 summarize projected costs by expenditure category by fiscal year. Capital reflects 78 percent of the total costs and is the largest category, totaling just under $42 million ($16 million in City capital improvements and $25 million in community capital improvements). Services and supplies are the next largest category, totaling nearly $6 million.

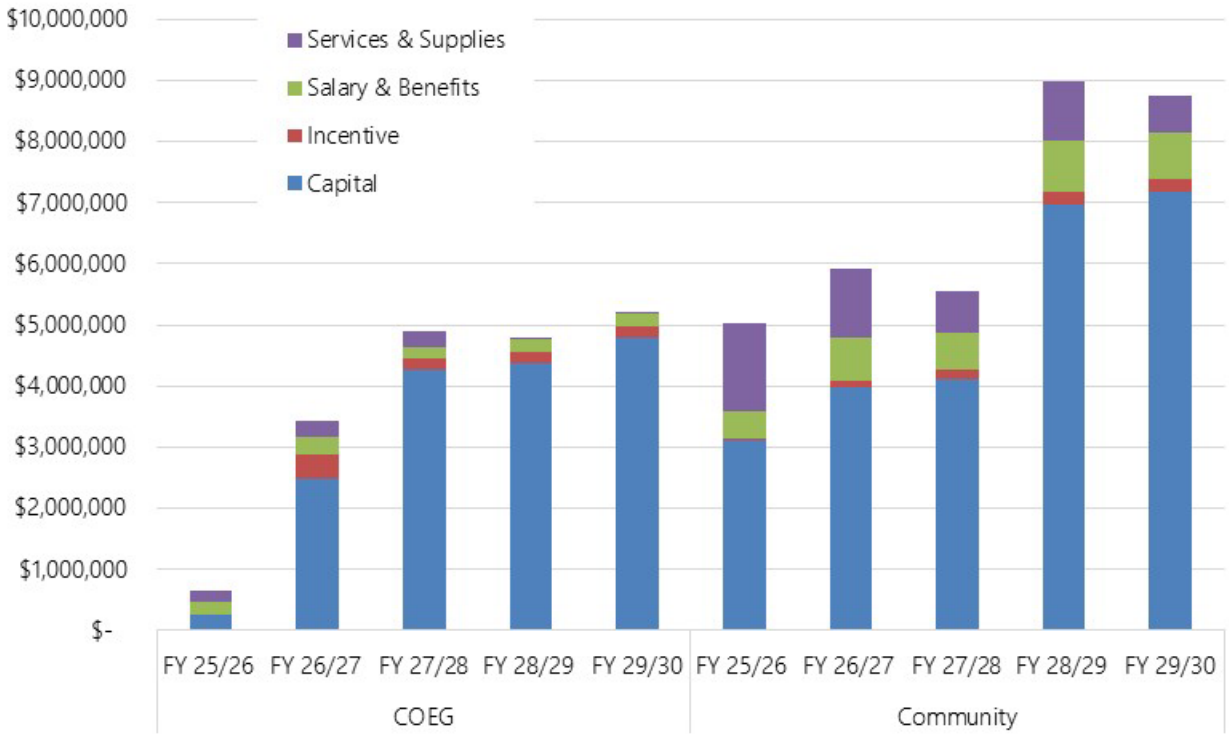
Table 4 Total Climate Compass Implementation Costs by Expenditure Category

Expenditure Category	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total	Percent of Total
COEG	**$663,895**	**$3,424,294**	**$4,897,654**	**$4,775,418**	**$5,206,127**	**$18,967,388**	**36%**
Capital	$265,5000	$2,486,162	$4,274,101	$4,375,005	$4,787,633	$16,188,402	30%
Incentive	$5,000	$396,550	$169,744	$174,836	$180,081	$926,212	2%
Salary & Benefits	$193,395	$285,369	$189,910	$206,454	$218,716	$1,093,844	2%
Services & Supplies	$200,000	$256,213	$263,899	$19,123	$19,696	$758,931	1%
Community	**$5,024,982**	**$5,920,215**	**$5,544,194**	**$8,980,967**	**$8,756,825**	**$34,227,186**	**64%**
Capital	$3,127,700	$3,994,031	$4,113,852	$6,969,085	$7,178,158	$25,382,825	48%
Incentive	$10,000	$87,550	$153,831	$213,082	$219,474	$683,936	1%
Salary & Benefits	$449,782	$710,874	$600,191	$824,907	$750,012	$3,335,676	6%
Services & Supplies	$1,437,500	$1,127,850	$676,324	$973,893	$609,182	$4,824,748	9%
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,850**	**$13,756,385**	**$13,962,952**	**$53,194,574**	**100%**

Notes: Totals may not sum exactly due to independent rounding. COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

Figure 5 Total Climate Compass Implementation Costs by Expenditure Category FY 2025/26 through FY 2029/30



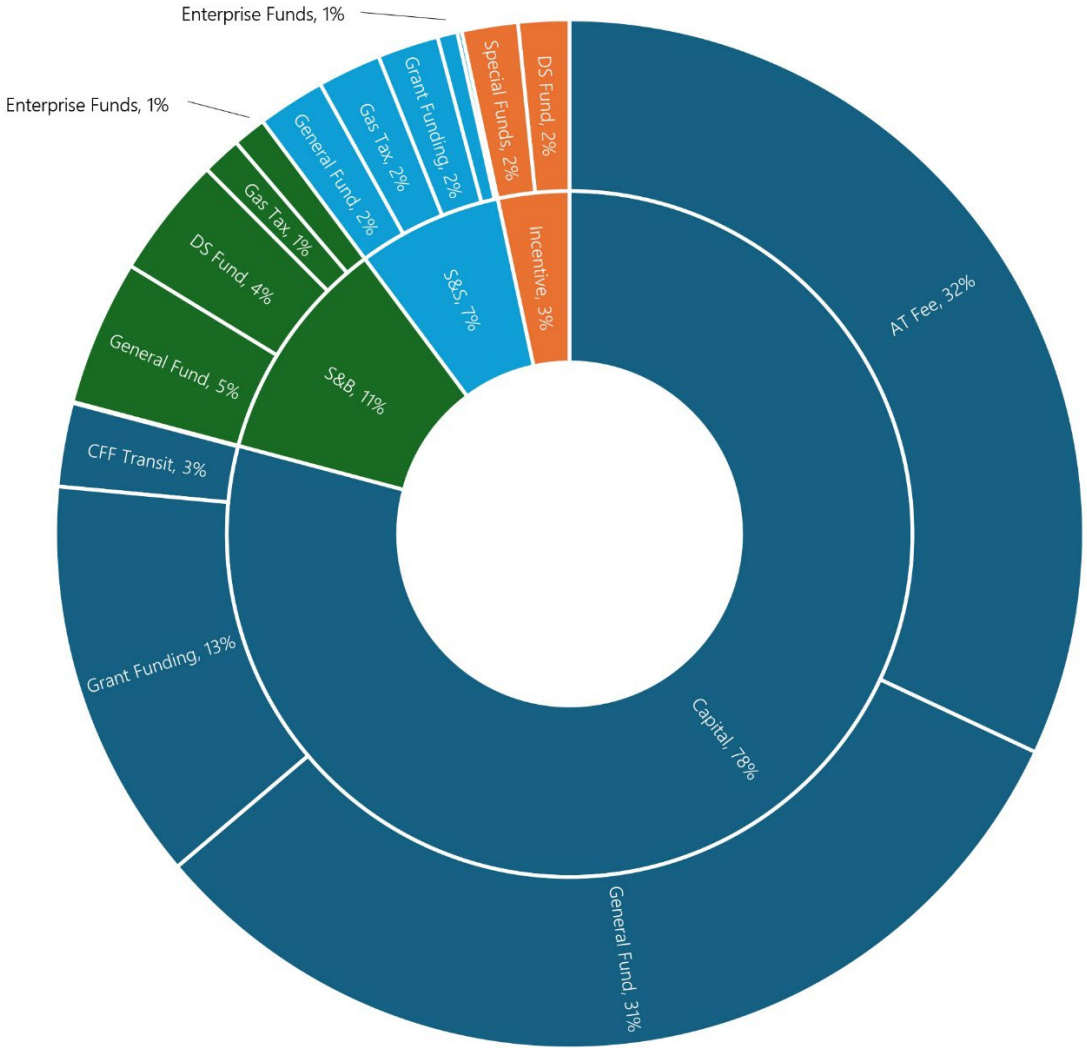
Notes: COEG = City of Elk Grove government.

Source: Analysis conducted by Ascent in 2025.

3.3.2 Funding Sources

Potential funding sources for Climate Compass implementation costs have been identified, understanding that all final funding allocations require City Council approval through the City's annual budget process. Funding sources include one-time only funding allocations that are approved each year during the budget process and generally for short term uses, general purpose revenue funding sources that are derived from sources not specific to any program or service delivery, special funds (e.g., Measure E, Measure A, Gas Tax) that are derived from fees for services or deposits, Development Impact Fees, Mitigation Fees, and grant funding. As part of the City's annual budget and Climate Compass implementation processes, City staff will continue to evaluate funding sources and financing strategies to reduce the fiscal impact of Climate Compass actions. For example, federal and state funding sources may be available for public sector climate-related investments through the Inflation Reduction Act, Bipartisan Infrastructure Law, California Greenhouse Gas Reduction Fund, and the State of California Budget, among others. Additional funding source information can be found in Attachment A of this document. Figure 6 demonstrates the primary funding sources for each of the expenditure categories.

Figure 6 Funding by Expenditure Category by Primary Funding Source



Notes: AT = Active Transportation; CFF = Capital Facilities Fee; S&B = salary and benefits: DS = Development Services; S&S = services and supplies.

Source: Analysis conducted by Ascent in 2025.

3.4 COSTS BY DEPARTMENT

This section summarizes Climate Compass implementation costs by City department. Not all departments have projected budgets through the Climate Compass cost analysis as their activities will be incidental to their other duties.

3.4.1 Total Costs by City Department

Table 5 summarizes implementation costs by City department over the five-year period. Figure 7 shows that the Public Works department has a majority of expenditures (80 percent), with the City Manager's Office and the Community Development department following at about 10 percent each.

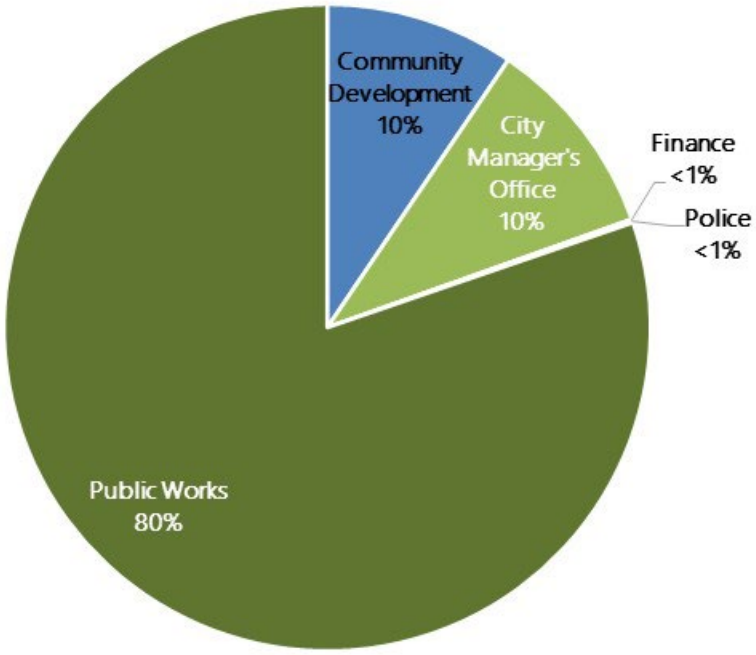
Table 5 Total Climate Compass Implementation Costs by City Department

Department	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total	Percent of Total
Community Development	$793,089	$1,638,275	$1,405,771	$658,214	$525,331	$5,020,682	9%
City Manager's Office	$637,0179	$1,348,217	$1,142,048	$1,100,868	$1,140,673	$5,368,824	10%
Finance	$0.00	$12,745	$1,824	$1,879	$1,937	$18,384	<1%
Police	$6,335	$23,497	$6,721	$19,308	$19,887	$75,745	<1%
Public Works	$4,252,435	$6,321,777	$7,885,486	$11,976,116	$12,275,125	$42,710,938	80%
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,850**	**$13,756,385**	**$13,962,952**	**$53,194,874**	**100%**

Notes: Totals may not sum exactly due to independent rounding. FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

Figure 7 Total Climate Compass Implementation Costs by City Department



Source: Analysis conducted by Ascent in 2025.

Table 6 presents the annual implementation costs by department for each expenditure category across the five-year period.

Table 6 Implementation Costs for Programs by Department and Expenditure Type FY 2025/26 through FY 2029/30

Department/Expenditure Type	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total
Community Development	**$793,089**	**$1,638,275**	**$1,405,771**	**$658,214**	**$525,331**	**$5,020,682**
Capital	$0	$772,500	$795,675	$273,182	$281,377	$2,122,734
Salary & Benefits	$105,589	$222,025	$172,475	$214,294	$180,644	$895,028
Services & Supplies	$687,500	$643,750	$437,621	$170,739	$63,310	$2,002,920
City Manager's Office	**$637,018**	**$1,348,217**	**$1,142,048**	**$1,100,868**	**$1,140,673**	**$5,368,824**
Capital	$262,500	$271,663	$279,812	$288,207	$296,853	$1,399,035
Incentive	$15,000	$484,100	$323,574	$387,918	$399,556	$1,610,148
Salary & Benefits	$324,518	$432,805	$368,917	$340,057	$357,038	$1,823,334
Services & Supplies	$35,000	$159,650	$169,744	$84,686	$87,227	$536,307
Finance	**$0**	**$12,745**	**$1,824**	**$1,879**	**$1,936**	**$18,384**
Salary & Benefits	$0	$12,745	$1,824	$1,879	$1,936	$18,384
Police	**$6,335**	**$23,495**	**$6,721**	**$19,308**	**$19,887**	**$75,745**
Salary & Benefits	$6,335	$23,495	$6,721	$13,844	$14,260	$64,654
Services & Supplies	$0	$0	$0.00	$5,464	$5,628	$11,091
Public Works	**$4,252,435**	**$6,321,777**	**$7,885,486**	**$11,976,116**	**$12,275,125**	**$42,710,938**
Capital	$3,130,700	$5,436,031	$7,312,466	$10,782,702	$11,387,560	$38,049,459
Salary & Benefits	$206,735	$305,083	$240,163	$461,287	$414,850	$1,628,118
Services & Supplies	$915,000	$580,662	$332,857	$732,127	$472,714	$3,033,361
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,850**	**$13,756,385**	**$13,962,952**	**$53,194,874**

Notes: Totals may not sum exactly due to independent rounding. FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

3.5 IMPLEMENTATION COSTS BY FOCUS AREA

This section presents Climate Compass implementation costs by each of the 10 focus areas: Buildings and Energy, Buildings and Facilities, Climate Action Commitment, Fleet and Employee Commute, Green Economy, Resilience, Resilience and Adaptation, Resource Consumption, Solid Waste and Water, and Transportation.

3.5.1 Total Climate Compass Implementation Costs by Focus Area

Total Climate Compass implementation costs associated with the Transportation focus area are estimated to be about $21 million over the five years, or 39 percent of the total cost. Estimated annual costs for this sector are about $4 million each fiscal year over the five-year period. The Buildings and Energy focus area has the second highest cost at $10 million (18 percent of total). Annual costs begin at $237,000 in FY 2025/26 and increase to $3 million over the five fiscal years. The Resource Consumption focus area has the next highest cost at $9 million (16 percent of the total). It increases from $200,000 in FY 2025/26 to $4 million in FY 2029/30. Table 7 summarizes total annual implementation costs by focus area.

Table 7 Total Climate Compass Implementation Costs by Focus Area

Focus Area	FY 2025/26	FY 2026/27	FY 2027/28	FY 2028/29	FY 2029/30	Total	Percent of Total
COEG	**$663,895**	**$3,424,294**	**$4,897,654**	**$4,775,418**	**$5,206,127**	**$18,967,388**	**36%**
Buildings and Facilities	$236,603	$1,546,312	$2,752,369	$2,554,406	$2,602,900	$9,692,591	18%
Fleet and Employee Commute	$365,569	$1,153,970	$903,501	$947,518	$1,291,527	$4,662,085	9%
Resilience	$44,057	$86,856	$622,268	$640,937	$660,165	$2,054,283	4%
Solid Waste and Water	$17,666	$637,155	$619,515	$632,558	$651,535	$2,558,430	5%
Community	**$5,024,982**	**$5,920,215**	**$5,544,194**	**$8,980,967**	**$8,756,825**	**$34,227,186**	**64%**
Buildings and Energy	$349,049	$399,099	$256,664	$139,104	$143,277	$1,287,194	2%
Climate Action Commitment	$111,272	$148,917	$184,296	$180,796	$181,570	$806,850	2%
Green Economy	$28,819	$49,348	$61,725	$55,502	$57,167	$252,561	0%
Resilience and Adaptation	$746,043	$401,196	$324,753	$685,093	$473,314	$2,630,400	5%
Resource Consumption	$200,649	$259,556	$98,771	$4,116,687	$3,983,598	$8,659,261	16%
Transportation	$3,589,150	$4,662,100	$4,617,987	$3,803,785	$3,917,899	$20,590,921	39%
Grand Total	**$5,688,877**	**$9,344,509**	**$10,441,850**	**$13,756,385**	**$13,962,952**	**$53,194,574**	**100%**

Notes: Totals may not sum exactly due to independent rounding. COEG = City of Elk Grove government; FY = fiscal year.

Source: Analysis conducted by Ascent in 2025.

4 CLIMATE COMPASS IMPLEMENTATION STAFFING IMPACTS

As part of Climate Compass implementation costs, staffing levels in hours (summarized by FTE[1]) required to implement Climate Compass actions were estimated. This section presents results in terms of FTE. For most actions, staffing impacts are reflected in partial FTEs per year (e.g., 0.25 FTE or 520 hours). In these cases, the projected increase was a few hours per year for a position and will be accommodated within the duties of an existing employee. Staffing impacts were evaluated for FY 2025/26 through FY 2029/30, aligning with the City's financial forecasts.

4.1 ANNUAL STAFFING IMPACT

Total staffing needed to implement the Climate Compass is estimated at a total of 26 FTE positions across five implementing departments over the 5 years, as shown in Table 8. Two departments, Finance and Police, have incremental staffing impacts that do not total a full FTE position in any fiscal year included in this cost analysis. All of the Climate Compass implementation activities are anticipated to be handled by existing staff across all departments.

Table 8 Total Staffing to Implement Climate Compass Actions by Department across FY 2025/26 - 2029/30

	Community Development	City Manager's Office	Finance	Police	Public Works	Total
Funded [existing]	5	10	0	0	10	26

Source: Analysis conducted by Ascent in 2025.

[1] FTE is assumed to equal 2,080 hours per year.

5 LIMITATIONS

This cost analysis uses best available information, data, and methods.

5.1 BASED ON DRAFT CLIMATE COMPASS AS PRESENTED

The results reflect preliminary cost estimates based on the strategies, and actions required for Climate Compass implementation. The final suite of strategies and actions approved by the City Council could have different cost and staffing impacts than included herein.

5.2 PRELIMINARY ESTIMATE

Cost and staffing impact results should be considered preliminary. Because there is limited information about the specific tasks that would be required to implement Climate Compass actions, the analysis relies on reasonable assumptions about the expected work to be performed. Over time, specific tasks required to implement final Climate Compass actions will become clearer and considerations for how to coordinate and sequence activities can be made, which may also affect ultimate costs and staffing levels. Future Climate Compass updates can use this cost analysis as a foundation and will reflect how experience implementing this Climate Compass improves budgeting accuracy for future years.

5.3 CLIMATE COMPASS TIME HORIZON

This analysis evaluated the City's implementation cost and staffing impacts for the Climate Compass' first five years through FY 2029/30 to match with the City's financial forecast. While the draft Climate Compass has a horizon year of 2045, this report does not estimate costs beyond FY 2029/30. Some Climate Compass actions may be implemented and have costs beyond the scope of this initial cost analysis, but only the costs during the next five years are estimated herein. Cost estimates can be updated through the Climate Compass monitoring update processes, and/or through the City's operational plan and five year forecasting.

5.4 GHG EMISSIONS EXCLUDED

This report does not consider the GHG emissions reductions associated with Climate Compass actions.

5.5 PRIVATE COSTS EXCLUDED

Many strategies and actions involve associated activities by Elk Grove residents, businesses, and developers that have private costs, such as buying an electric vehicle or installing new electric appliances in place of conventional appliances. These private costs were not considered in this analysis.

6 LIST OF PREPARERS

Honey Walters ..... Principal-In-Charge
Erik de Kok ..... Project Director
Hannah Kornfeld ..... Project Manager
Claire Moss ..... Senior Climate Action Planner
Brenda Hom ..... Senior Climate Action Planner
Patrick Wickstrom ..... Climate Action Intern
Michele Mattei ..... Publishing Specialist
Corey Alling ..... Graphic Specialist

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Attachment A

Climate Compass Implementation Costs
Funding Sources

This Table provides a list of potential funding sources for implementing the Climate Compass for each funding category identified in the Climate Compass Figure 6. Programs and funding sources for implementing emissions reduction programs reflect what is available as of June 2025 and are developing rapidly and may change substantially from year to year. As outlined in the Implementation and Monitoring program for the Climate Compass (Chapter 5), the City will stay up to date on available funding and financing sources to maximize resource efficiency.

Funding Category	Funding Source or Program	Description
City	General Fund	Provides funding for the City's primary operating accounts, used to finance core functions like public safety, infrastructure, and community services, with revenues from taxes, fees, and other sources that aren't earmarked for specific purposes.
	Development Services Fund	A type of fund to account for activities that provide goods or services to the general public.
	Special Funds	Financial resources that are earmarked and restricted for specific purposes, distinct from general revenue, and are used for things like specific programs or projects.
	Development Impact Fees	One-time charges levied by the City on new development to help offset the costs of infrastructure and public services needed to accommodate growth (e.g., roadways, active transportation, and transit).
	Mitigation Fees	Charges imposed by the City on development projects to offset the impact of new construction on public facilities and services, ensuring these fees are used for their intended purpose and not diverted for general revenue (e.g., Swainson's Hawk, agriculture, trees).
Utilities	Environmental Champions Program	Provides program funding to support climate action through habitat restoration and urban greening. Priority is given to programs that serve low-income, diverse, and under-invested communities.
	Energy Efficiency Programs	Various programs offered for commercial, industrial, agricultural, and public sector customers to provide funding for energy efficiency projects through local energy providers.
	Sacramento Municipal Utility District (SMUD)	Existing and future programs that would fund or incentivize GHG reduction measures.
	Regional Energy Network	Proposed regional program that would offer programs and funding to promote energy efficiency, demand response and conservation programs, services and resources, and outreach to communities through a partnership between SMUD and others.
	Solar Discount Program	Program to increase local, new-build, small-scale solar projects under the California Public Utilities Commission Community Solar Green Tariff Program.
	Community Clean Energy Grant Program	Provides rebates and cash incentives for energy-efficient business improvements.
	Feed-In Tariff	SMUD offers various programs for small-scale, distributed renewable energy, including Greenergy, Virtual Solar, My Energy Optimizer Partner+, and Energy StorageShares, to help customers utilize renewable energy and reduce their carbon footprint.

Funding Category	Funding Source or Program	Description
Regional, State, and MPO	California Air Resources Board (CARB) Programs	CARB offers several grants, incentives, and credit programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. The following programs can be used to fund local measures: ▶ Air Quality Improvement Program (Assembly Bill [AB] 118) ▶ Loan Incentives Program ▶ California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project ▶ Low Carbon Transportation Investments and the Air Quality Improvement Program
	Sacramento Metropolitan Air Quality Management District (SMAQMD)	SMAQMD offers several incentive and grant programs to help reduce air pollution, including: ▶ Community Air Protection Incentives (CAPI) Program ▶ Carl Moyer Memorial Air Quality Standards Attainment Program ▶ Supplemental Environmental Projects (SEP)
	California Climate Investments (CCI)	CCI uses proceeds from the cap-and-trade program to facilitate investments to further the state's climate goals. Through funding from the state's Greenhouse Gas Reduction Fund, CCI offers the various programs to promote clean energy and efficiency, as well as the following incentive programs: ▶ The California Vehicle Rebate Program ▶ The Clean Vehicle Assistance Program
	California Department of Community Services and Development	The Low-Income Weatherization Program (LIWP) provides low-income households with solar photovoltaic (PV) systems and energy efficiency upgrades at no cost to residents.
	California Department of Motor Vehicles	The Motor Vehicle Registration Fee Program provides funding for projects that reduce air pollution from vehicles.
	California Department of Transportation (Caltrans) Programs	Caltrans offers several programs and grants supporting sustainable transportation initiative, including: ▶ Low Carbon Transit Operations Program ▶ Active Transportation Program ▶ Transit and Intercity Rail Capital Program ▶ Strategic Partnership Grants ▶ Sustainable Transportation Planning Grant Program
	Sacramento Area Council of Governments (SACOG) Programs	SACOG offers programs and grants supporting sustainable transportation initiatives including: ▶ Sustainable Mobility Program ▶ Regional Active Transportation Program
	California State Board of Equalization	Section 73 of the California Revenue and Taxation Code allows a property tax exclusion for qualifying new solar installations, meaning that property taxes will not increase for individuals if they install solar on their property. This tax exclusion was set to expire in 2016, but is now extended through January 1, 2025.

Funding Category	Funding Source or Program	Description
	Proposition 1: State Coastal Conservancy Grant	Provides funds for multi-benefit ecosystem and watershed protection and restoration projects.
	Transformative Climate Communities (TCC) Program	Provides assistance to disadvantaged communities to locate affordable housing near transit and increase energy savings and clean transportation, per AB 2722 (September 2016)
	California Department of Food and Agriculture's Healthy Soils Program	Provides incentives to farmers and ranchers to enhance buildup of soil carbon on agricultural lands.
	California Energy Commission (CEC) and California Public Utilities Commission (CPUC) Programs	CEC and CPUC offer a variety of programs and grants, including: ▶ Multi-Family Affordable Housing Solar Roofs Program (CPUC) ▶ Local Government Challenge Program (CEC) ▪ Retrofits California's existing residential, commercial, and public buildings to become high-performing and energy-efficient ▶ Electric Program Investment Challenge (EPIC) Program. (CPUC) (Funds clean energy research, demonstration and deployment projects that support energy policy goals and promote greater electricity reliability, lower costs, and increased safety.) ▶ Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) (CEC) (Funds gaps in the energy innovation pipeline for the development and deployment of alternative and renewable fuels and advanced transportation technologies.) ▶ Energy Upgrade California Program. (CEC and CPUC, administered by utilities) ▪ Funds for energy upgrade rebates, financing, and other incentives.
	California Department of Forestry and Fire Protection's (CalFire's) Urban and Community Forestry Program	Supports several urban tree planting projects, including jurisdiction wide tree inventory and urban forest mapping, analysis, and long-term management planning; urban wood and biomass utilization projects; and projects to assist local entities purchase and improve unused lots; and projects for urban green infrastructure.
	California Natural Resources Agency (CNRA) Programs	Urban Greening Grant Program ▶ Funds projects that reduce GHGs by sequestering carbon, decreasing energy consumption and reducing vehicle miles traveled, while establishing and enhancing parks and open space, using natural solutions to improve air and water quality and reducing energy consumption, and creating more walkable and bike-able trails. Environmental Enhancement and Mitigation Program ▶ Funds projects that contribute to mitigation of the environmental effects of transportation facilities. These include urban forestry projects designed to offset GHG emissions. Urban Green Infrastructure Program ▶ Funds multi-benefit green infrastructure investments in or benefitting disadvantaged or severely disadvantaged communities.

Funding Category	Funding Source or Program	Description
	California Department of Food and Agriculture (CDFA) Programs	Alternative Manure Management Program ▶ Provides financial assistance for the implementation of non-digester manure management practices to help reduce GHG emissions. Fertilizer Research and Education Program ▶ Funds research and education to advance the environmentally safe and agronomically sound use and handling of fertilizing materials. State Water Efficiency and Enhancement Program ▶ Provides grants to implement irrigation systems that reduce GHGs and save water on California agricultural operations.
	Strategic Growth Council (SGC) and State Department of Conservation (DOC) Programs	The Strategic Growth Council (SGC) and the State Department of Conservation (DOC) provide grants to fund sustainable community planning, natural resource conservation, and development and adoption. These include: ▶ Sustainable Communities Planning Grant and Incentives Program. (SGC) ▪ Supports local land use planning related to climate and the State's statutory planning opportunities. These grants will support the development and/or implementation of a specific portion of a land use plan, land protection or management practice, or development project (e.g., Climate Action or Adaptation Plans, GHG inventories). ▶ Resource Conservation District Assistance Program ▪ Provides assistance to local resource conservation districts to educate landowners and the public about resource conservation. ▶ Affordable Housing and Sustainable Communities (AHSC) Program (SGC) ▪ Distributes California Greenhouse Gas Reduction Fund (GGRF) funds to disadvantaged communities. Eligible projects include providing affordable housing, transit-oriented development (TOD), transit, complete streets, and active transportation projects that reduce GHG emissions and vehicle miles traveled. ▶ Sustainable Agricultural Lands Conservation (SALC) Program ▪ Provides funding to protect at-risk agricultural lands from conversion to more GHG-intensive land uses, such as urban or rural residential development. This program intends to promote growth within jurisdictions, ensure open space remains available, and support a healthy agricultural economy and resulting food security.
	California Department of Resources Recycling and Recovery (CalRecycle) GHG reduction Grant and Loan Program	Provides financial incentives for capital investments to composting/digestion infrastructure and recycling manufacturing facilities that will result in reduced GHG emissions.

Funding Category	Funding Source or Program	Description
Federal	Federal Transit Administration (FTA) Programs	FTA has a variety of available grants and programs available for transit agencies and local governments including: ▶ Urbanized Area Formula Grants ▶ Buses and Bus Grants Program
	Federal Solar Investment Tax Credit	The federal residential solar energy credit is a tax credit that can be claimed on federal income taxes for a percentage of the cost of a solar PV system. The tax credit expires starting in 2035 unless Congress renews it.
	Federal Inflation Reduction Act (IRA)	The IRA includes nearly $400 billion in climate-related funding and nearly $370 billion in investments in disadvantaged communities. The IRA supports projects including EV charging, power infrastructure, and climate resilience.
	Renewable Electricity Production Tax Credit	The renewable electricity production tax credit (PTC) is a per kilowatt-hour (kWh) federal tax credit included under Section 45 of the U.S. tax code for electricity generated by qualified renewable energy resources.
	Reconnecting Communities Pilot Program-Planning Grants and Capital Construction Grants	The Bipartisan Infrastructure Law established this discretionary grant program, funded with $1 billion over the next 5 years. It is the first-ever Federal program dedicated to reconnecting communities that were previously cut off from economic opportunities by transportation infrastructure. Funding supports planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities.
	Low Income Home Energy Assistance Program (LIHEAP)	LIHEAP is a federal program administered by the U.S. Department of Health and Human Services that provides assistance to eligible low-income households to manage and meet their immediate home heating and/or cooling needs including: ▶ Home Energy Assistance Program ▶ Energy Crisis Intervention Program ▶ Weatherization ▶ Energy budget counseling and education
	Electric Vehicles Tax Credits (Inflation Reduction Act)	The Inflation Reduction Act (IRA) extends tax credits for EVs and establishes new tax credits for used EVs and commercial EVs, as well as credit for clean heavy-duty vehicles and EV charging equipment.
	Greenhouse Gas Reduction Fund	The Inflation Reduction Act amended the Clean Air Act to create this national-scale program to provide a total of $27 billion in public funding to mobilize financing and private capital to address the climate crisis, ensure economic competitiveness, and promote energy independence while delivering lower energy costs and economic revitalization to communities that have historically been left behind. These funds would be distributed through the National Clean Investment Fund, the Clean Communities Investment Accelerator, and Solar for All programs.

Funding Category	Funding Source or Program	Description
	Promoting Resilient Operations for Transformative, Efficient and Cost-Saving Transportation (PROTECT) Program	This program would help local governments improve the resiliency of their on-system transportation infrastructure. Specifically, the program provides federal funding to help communities address vulnerabilities and plan transportation improvements and emergency response strategies associated with weather events, increasing frequency and magnitude of natural disasters, and changing climate conditions, including sea level rise.
	Partnership for Sustainable Communities	A multi-agency partnership between U.S. Department of Housing and Urban Development, U.S. Department of Transportation, and the U.S. Environmental Protection Agency that offers grant funding to help build more viable, walkable, and environmentally sustainable communities.
	Federal Income Tax Credits for Energy Efficiency	Provides tax credits for energy efficiency upgrades for homes.
Private	Private Funding	Private equity can be used to finance energy improvements, with returns realized as future cost savings.
	Private Funding Peer-to-Peer (P2P) Lending/Crowdfunding	Peer-to-Peer Lending and Crowdfunding provides private funding sources through various methods: ▶ Net energy cost savings from improved energy efficiency can fund retrofits in households. ▶ Power Purchase Agreements (PPAs) involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15-25 years. After the contract period, the company would uninstall the technology or sign a new contract. ▶ Crowdfunding and P2P lending organizations offer easy, efficient, and low-cost sources for capital investments, loan repayment, and project funding
	Municipal Bonds	There are two basic types of municipal bonds: General Obligation Bonds and Revenue Bonds. General Obligation Bonds often require voter assent and tend to have lower interest rates than Revenue Bonds. With Revenue Bonds, the principal and interest is secured by revenues derived from tolls, charges, or rents from the facility built with the proceeds of the bond issuance.
	Property-Assessed Clean Energy (PACE)	Under AB 811, the State's PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments. This program is administered by a variety of private entities including California FIRST, HERO PACE Program, and Ygrene Energy Fund. Municipalities are authorized to designate areas where property owners can enter contractual assessments to receive long-term, low- interest loans for energy and water efficiency improvements, and renewable energy installation on their property.
	Federal Housing Administration's Energy Efficient Mortgages (EEM) Program	Credits a home's energy efficiency features in the mortgage itself. To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. EEMs typically are used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home.

Appendix G

Community Engagement

Date	Organization	Topic	Engagement Type	Reach
4/17/2023	Trails Committee	CAP Update & Climate Ambassador Program	In-person	
5/3/2023	Youth Commission	Climate Ambassador Program	Email	
5/3/2023	Diversity & Inclusion Commission	Climate Ambassador Program	Email	
6/13/2023	Interfaith Council of Elk Grove	CAP Update & Climate Ambassador Program	In-person	
6/21/2023	Disability Advisory Committee	CAP Update & Climate Ambassador Program	In-person	
6/29/2023	NeighborGood Market Pop-Up	CAP Update	In-person	
7/19/2023	Compassion Elk Grove	CAP Update Outreach efforts	In-person	
7/23/2023	Sundae Funday	CAP Update	In-person	
9/6/2023	TAG Meeting #1		Virtual	
9/25/2023	Climate Ambassadors	Climate Ambassador meeting	In-Person	
10/7/2023	Giant Pumpkin Festival		In-person	
10/17/2023	Climate Ambassadors	Climate Ambassador meeting	Virtual	
10/26/2023	NeighborGood Market Pop-Up		In-person	
10/31/2023	TAG Meeting #2		Virtual	
11/15/2023	Climate Compass Community Meeting		Virtual	
11/21/2023	Compassion Elk Grove		In-Person	
12/3/2023	Regional Environmental Groups	CAP Update/Progress	Virtual	
12/11/2023	Climate Ambassadors	Climate Ambassador meeting	In-Person	
1/11/2024	TAG Meeting #3		Virtual	
2/15/2024	Widowed Persons Social Club	CAP Update	In-person	
2/16/2024	TAG Meeting #4		Virtual	
2/20/2024	Climate Ambassadors	Climate Ambassador meeting	In-Person	
3/11/2024	Climate Ambassadors @ Good Shepherd Church		In-person	
3/19/2024	Internal CAP WG		Hybrid	
3/21/2024	Climate Ambassadors	R&W	In-person	
4/26/2024	TAG Meeting #5	KPIs	In-person	
4/27/2024	Climate Ambassadors Pop-Up	CAP Outreach	In-person	
5/12/2024	Climate Ambassadors @ Bloomfest	CAP Outreach	In-person	
5/23/2024	Internal CAP WG	KPIs	Hybrid	
5/29/2024	Climate Ambassadors	Transportation	In-person	
6/5/2024	Regional Environmental Groups	Inventory/ Progress	Virtual	
6/9/2024	Sundae Funday	CAP Outreach	In-person	
7/16/2024	IWG Meeting	CAP update & building sector	In-person	
7/24/2024	City Council Info Session 1	GHG inventory/Forecast, Potential actions for resilience, adaptation, green economy	In-person	
7/30/2024	Climate Ambassadors	Buildings	In-person	
8/6/2024	GSREHA	Rural Area	In-person	

Date	Organization	Topic	Engagement Type	Reach
8/14/2024	City Council Info Session 2	Building sector	In-person	
8/20/2024	IWG Meeting	Building sector	In-person	
8/28/2024	City Council Info Session 3	Transportation sector	In-person	
9/14/2024	Multicultural Festival	CAP Outreach	In-person	
9/15/2024	Climate Ambassadors @ Bloomfest	CAP Outreach	In-person	
9/23/2024	350 Sac	Climate Compass	Virtual	
10/3/2024	Sacramento Realtors Association, Govt Relations Committee	Climate Compass, building sector	In-person	
10/11/2024	California Restaurant Association	Climate Compass, building sector	Virtual	
12/5/2024	TAG Meeting #6	Draft strategies/actions	Virtual	
12/11/2024	AGC California	Climate Compass	Virtual	
12/19/2024	ABCNorCal	Climate Compass	In-person	
1/9/2025	Public Meeting	NOP Scoping Mtg	In-person	
1/13/2025	350 Sac	NOP	Virtual	
2/21/2025	ABCNorCal	Draft strategies/actions - BE and Off-road	Virtual	
3/4/2025	BIA	Climate Compass, building sector	Virtual	
3/12/2025	City Council Info Session 4	Draft strategies/actions	In-person	
4/4/2025	Earth Month Social Media Promotions		Virtual	
4/22/2025	Earth Day Festival @ Cosumnes River College	CAP Outreach	In-person	
6/8/2025	Sundae Funday	CAP Outreach	In-person	
6/26/2025	Draft SEIR Constant Contact Message	Draft SEIR document available	Email	213 subscribers
6/26/2025	Climate Compass Public Draft Constant Contact Message	Public Draft Climate Compass	Email	538 subscribers
6/30/2025	Week At A Glance Newsletter	Public Draft Climate Compass	Email	1844 subscribers
7/7/2025	Week At A Glance Newsletter	Public Draft Climate Compass/Community Meeting	Email	1857 subscribers
7/7/2025	Climate Compass Community Workshop Constant Contact Message	Public Draft Climate Compass/Community Meeting	Email	543 subscribers
7/8/2025	Facebook Post	Public Draft Climate Compass/Community Meeting	Virtual	2375 reached
7/8/2025	Instagram Post	Public Draft Climate Compass/Community Meeting	Virtual	1782 reached
7/8/2025	Climate Compass Community Workshop	Public Draft Climate Compass	In-person	
7/14/2025	Draft SEIR Meeting Constant Contact Message	Draft Supplemental EIR document	Email	686 subscribers
7/15/2025	IWG Meeting	Public Draft Climate Compass	Virtual	
7/20/2025	Facebook Post	Draft SEIR Meeting	Virtual	2063 reached
7/20/2025	Instagram Post	Draft SEIR Meeting	Virtual	1127 reached
7/20/2025	X Post	Draft SEIR Meeting	Virtual	340 reached
7/21/2025	Trails Committee	Public Draft Climate Compass	In-person	

Date	Organization	Topic	Engagement Type	Reach
7/22/2025	Draft SEIR Meeting	Draft Supplemental EIR document	Virtual	
8/3/2025	350 Sacramento monthly meeting	Public Draft Climate Compass	In-person	
8/7/2025	Planning Commission	Public Draft Climate Compass	In-person	
8/7/2025	Facebook Reel	Public Draft Climate Compass	Virtual	1124 reached
8/7/2025	Instagram Reel	Public Draft Climate Compass	Virtual	2231 reached
8/9/2025	BBQ in the Beat	Public Draft Climate Compass	In-person	
8/11/2025	Climate Compass Constant Contact Message	Public Draft Climate Compass Last Chance	Email	558 subscribers
8/21/2025	ECOS Meeting	Public Draft Climate Compass	In-person	

Climate Action Survey

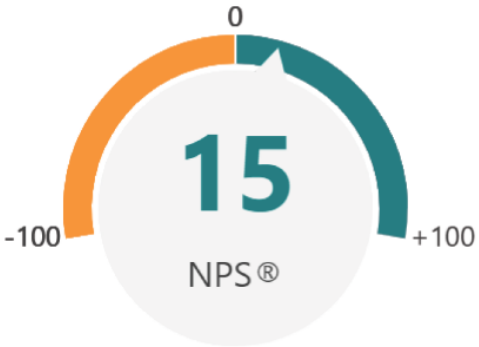
236	30:17	Closed
Responses	Average time to complete	Status

1. Which of the following statements best describes your attitude toward change?

Enthusiastic - I like to be one of ...	41
Visionary - I am not always the f...	106
Pragmatic - I prefer for other pe...	71
Conservative - I prefer to wait u...	10
Skeptical - I am usually the last ...	5

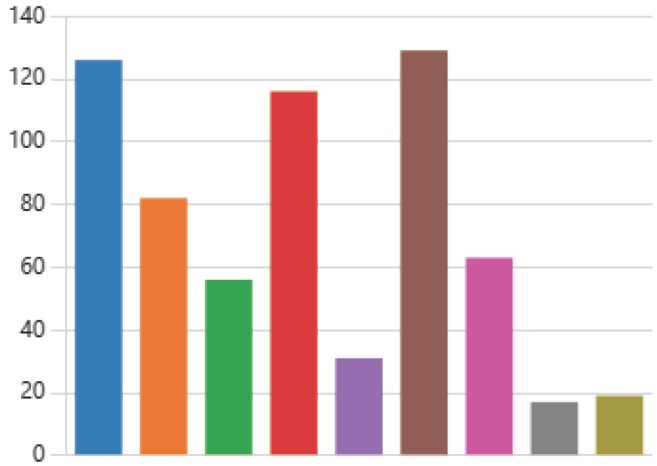
2. On a scale of 1 to 10, how likely do you think it is that climate change will threaten your personal health and safety?

Promoters	105
Passives	62
Detractors	69



3. What personal or citywide climate impacts are you most concerned about? Choose up to 3.

Public health impacts	126
Impacts on vulnerable populatio...	82
Impacts on my personal finance...	56
Impacts on my home, property, ...	116
Impacts to the transportation sy...	31
Impacts on energy use and the ...	129
Impacts to the City's ability to p...	63
Impacts to businesses througho...	17
Other	19



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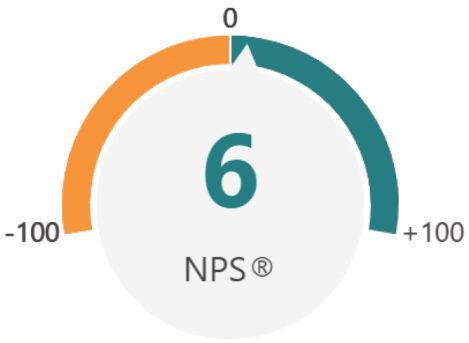
4. On a scale of 1 to 10, how likely are you to recommend to a friend or a colleague activities that will help reduce climate impacts?

Promoters	87
Passives	75
Detractors	73



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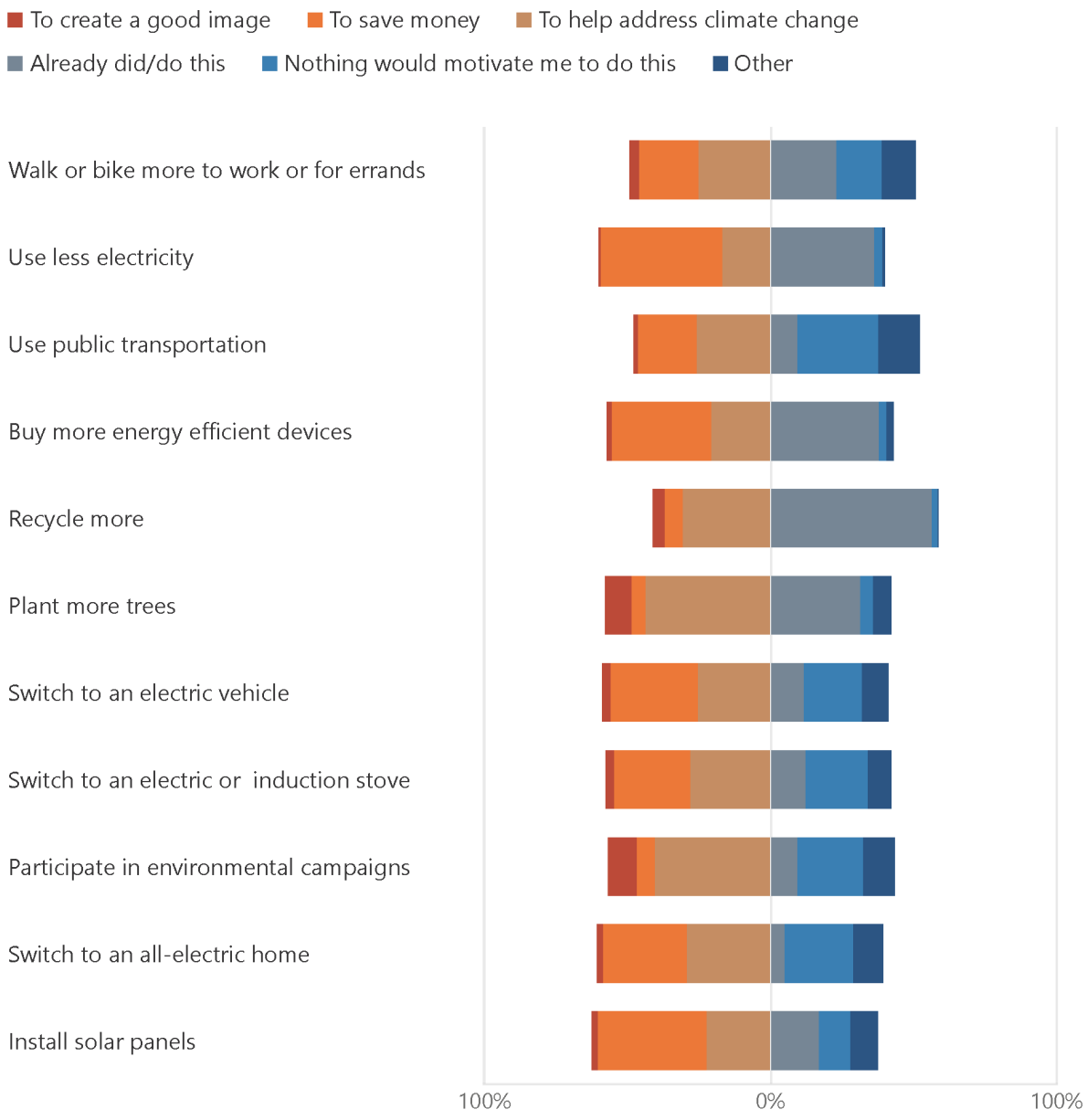
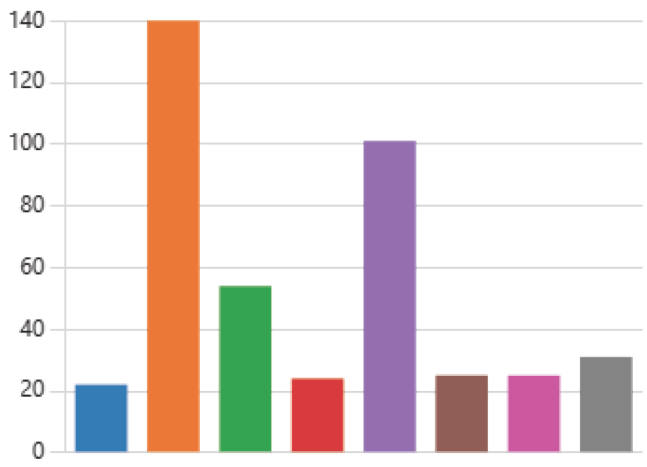
5. What would motivate you to do the following activities?



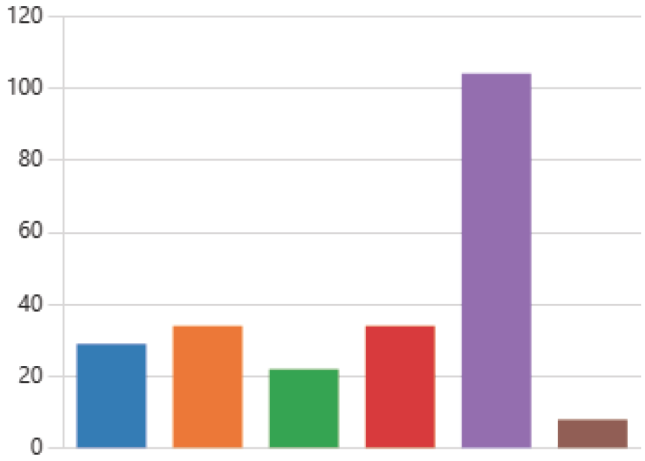
6. What are the biggest barriers to you making climate-friendly lifestyle changes?

I'm a renter	22
It's too expensive	140
I need more information/ educa...	54
I don't have time	24
I need support (e.g., incentives ...	101
I don't trust the technology	25
I have safety concerns	25
Other	31

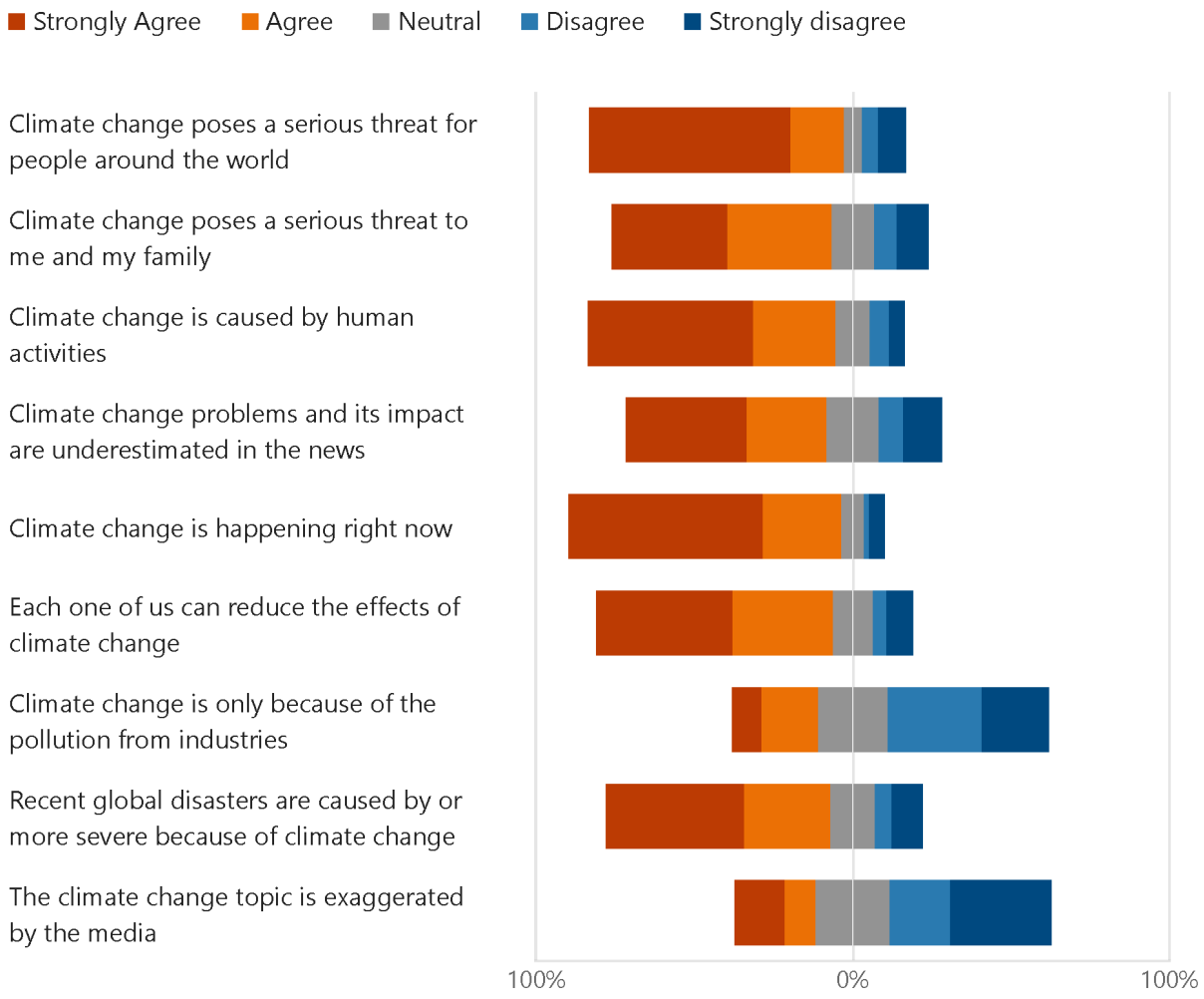


7. Who do you think has the most responsibility for tackling the effects of climate change in Elk Grove?

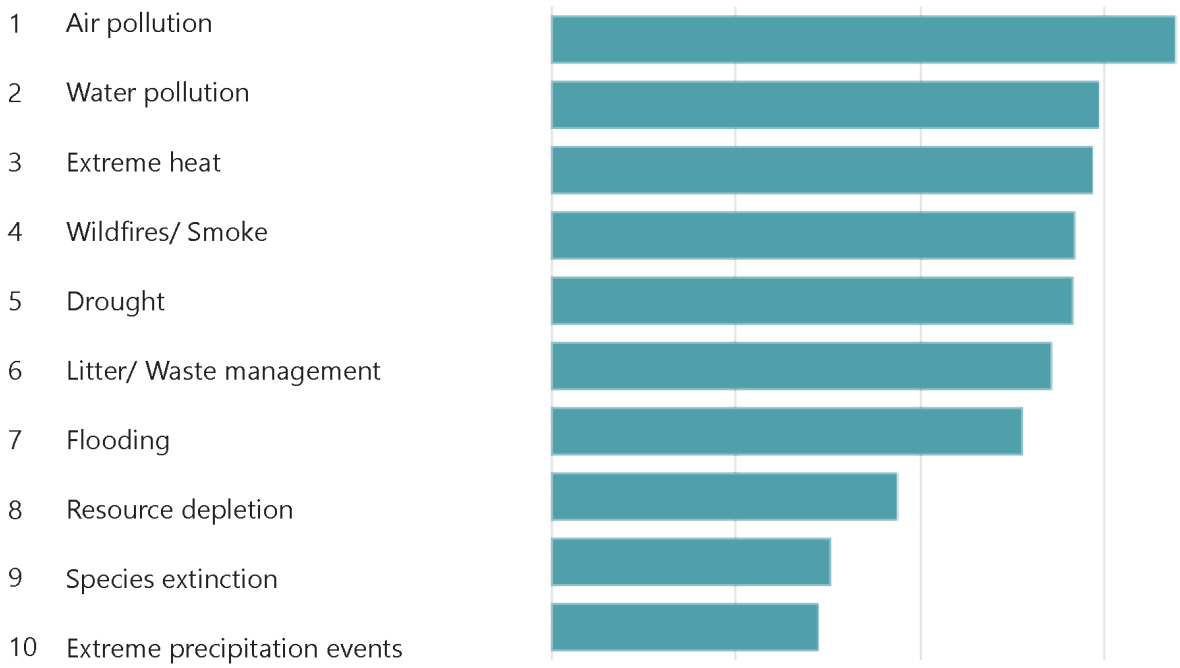
Federal/State Government	29
Local Government	34
Businesses and Industries	22
Individuals/ the General Public	34
None: All have equal responsibi...	104
Don't Know	8



8. Please state the level of agreement with the following statements regarding climate change.



9. Rank the importance of the following issues in Elk Grove.



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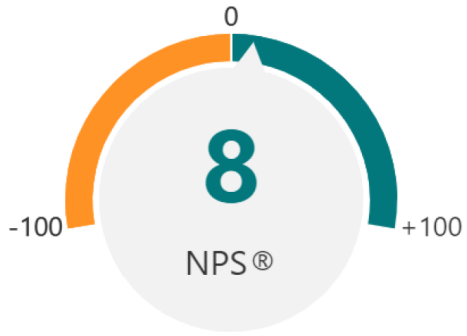
10. On a scale of 1 to 10, how willing are you to change your lifestyle to reduce the damage to the environment?

Promoters	82
Passives	88
Detractors	63



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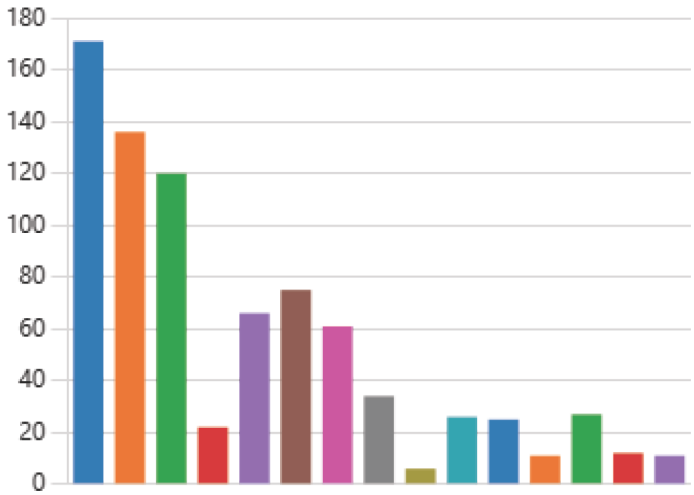
11. Which of the following sources do you trust to provide accurate information about climate change?

Scientific Organizations, such as...	171
Scientists Working at Universities	136
Environmental Organizations, su...	120
TV News (e.g., NBC, CBS, Fox, etc.)	22
Federal Government	66
State Government	75
Local Government	61
Newspapers or News Websites	34
Social Media (e.g., Facebook, X)	6
Family Members	26
Colleagues and/or Friends	25
Energy Suppliers	11
None of the above	27
All of the above	12
Other	11



12. What questions do you have about climate change?

75

Responses

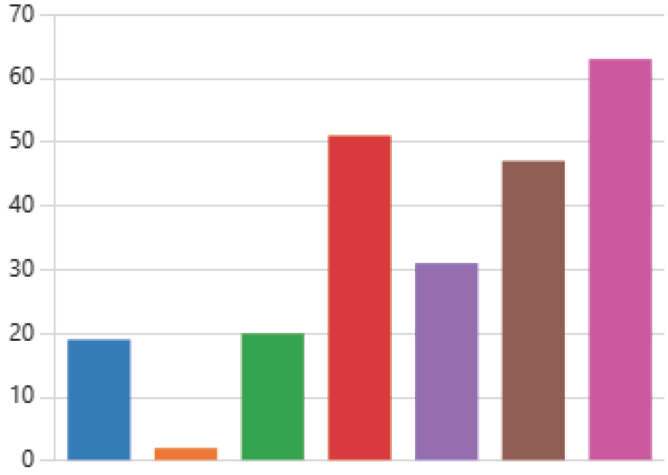
Latest Responses

"Who are we going to start to make us successful for the future ...

"Why aren't legislators making laws to adapt to climate change...

13. What is your age?

Under 18	19
18-24	2
25-34	20
35-44	51
45-54	31
55-64	47
65 and older	63

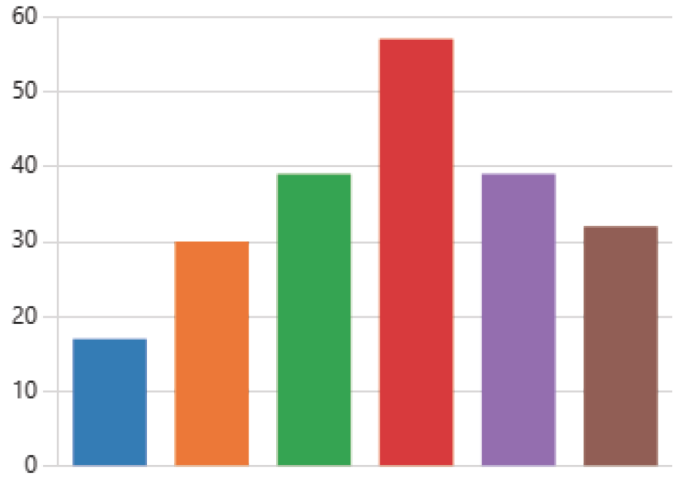


14. What is your gender?

Female	123
Male	84
Non-binary	0
Prefer not to say	22
Other	3

15. What is your annual household income?

Under $50,000	17
$50,000 - $75,000	30
$75,001 - $100,000	39
$100,001 - $150,000	57
$150,001 - $200,000	39
Over $200,000	32



16. What is your zip code?

95624	89
95757	62
95758	72
Other	13

City of Elk Grove

Climate Compass

Community Workshop #1

Wednesday, November 15, 2023

6:00 p.m. – 7:30 p.m.

Executive Summary

Community Workshop #1 for the Elk Grove Climate Compass was attended by 16 people (excluding City and Ascent staff). This virtual workshop was conducted via Zoom, and included a presentation, followed by a group activity organized by the following topics: infrastructural vulnerabilities, societal vulnerabilities, environmental vulnerabilities, and community strengths. The following summary provides more detail on what was covered in the presentation, including an overview of the Climate Compass, the greenhouse gas (GHG) emissions inventory, and some of the key climate hazards facing the city, along with key themes and insights gathered from the group activity.

Presentation

Hannah Kornfeld, Project Manager (Ascent) opened the workshop by welcoming all participants and introduced Carrie Whitlock, Strategic Planning & Innovation Program Manager (City of Elk Grove). Carrie reviewed the agenda for the meeting, which included: (1) Welcome and Introductions; (2) Climate Compass Overview; (3) Greenhouse Gas (GHG) Inventory; (4) Key Climate Hazards; (5) Community Strengths and Weaknesses Activity; (6) Questions and Next Steps. Carrie then provided an overview of the Climate Compass, including some key terms (e.g., climate change, sustainability, resilience), project timeline, and other background information before delegating back to Hannah, who led the remainder of the presentation.

Hannah began by providing a brief overview of GHG sectors and sources, and Elk Grove's 2021 communitywide GHG inventory. As shown in the figures above, on-road transportation and building energy are the two sectors that make up the vast majority of Elk Grove's communitywide GHG emissions. Following this, Hannah discussed and characterized some of the key climate hazards facing the city, including extreme heat, flooding, drought, and wildfire/smoke, which are all projected to be exacerbated by climate change to some degree. This discussion concluded the bulk of the presentation, and the remaining items that followed were a brief Q&A session, group activity instructions (further described below), and next steps for the Climate Compass.

Group Activity

Noting the climate hazards that were discussed during the presentation piece (i.e., extreme heat, flooding, drought, wildfire/smoke), the purpose of the group activity was to identify Elk Grove's vulnerabilities and strengths in the context of these hazards. More specifically, the group activity utilized the Mural platform to gather participant feedback on infrastructural vulnerabilities (e.g., roads flooding during storm events), societal vulnerabilities (e.g., senior housing without backup generators during heat waves), environmental vulnerabilities (e.g., lack of urban tree canopy), and community strengths. A snapshot of some of the primary themes that emerged from the activity are presented below. A full video recording of the group activity (and the presentation) can be found on the City's website and the Mural feedback can be found as the end of this summary.

Infrastructural Vulnerabilities

- Roads (e.g., Elk Grove Blvd) – blockages during major storm events.
- Walkways – lack of tree cover/shade during extreme heat days; accessibility issues during flooding events.
- Homes – HOA lawn mandates during periods of drought/extreme heat and lack of native and drought-tolerant plants; excess A/C usage during extreme heat.
- Future Development – issues with ensuring adequate access to water supply; too much sprawl eliminating natural buffers.
- Schools – lack of shade structures in playgrounds; air filters need upgrading for smoke/poor air quality days.
- Highways – fire risk from overgrown grasses.
- Transit Stops – lack of shade structures (natural or built).

Societal Vulnerabilities

- Senior Housing – lack of backup generators during heat waves.
- Human Health – extreme heat resulting in heat stroke and other health issues; disease outbreaks increased by flooding; wildfire smoke causing respiratory issues.
- Food Sources – decrease in crop production and increased costs as a result of extreme heat and flooding; food storage and access issues during power outages.
- Cooling Centers – lack of safe and accessible cooling centers dispersed throughout the city.
- Emergency Services – more emergency energy and battery storage needed during extreme heat events; lack of established protocols for moving emergency equipment in flooded areas.

Environmental Vulnerabilities

- Urban Tree Canopy/Street Trees – how to maximize tree canopy with minimal water use?
- Parks – hazardous trees from extreme heat/flooding, which can damage property and decrease shade (e.g., from fallen limbs); inaccessible paths from flooding; lack of drought-tolerant plants in parks (i.e., too much grass).
- Lawns – not sustainable or suitable for Elk Grove climate.
- Urban Sprawl – taking up space that could be used for natural environment; there could be more use for natural infrastructure to reduce flood risk.

Community Strengths

- New fully electric residential buildings with solar capabilities.
- More EV charging stations are being installed.
- Motivated City staff and residents that are committed to sustainability.
- New bike trails being added.
- Existing playgrounds and green spaces are being utilized.
- Educated residents.
- Farmers markets.
- Great recycling center for hazards materials, paints, etc.
- Community events year round.
- Leveraging partnerships with cultural groups; diversity is a strength in Elk Grove.

Appendix H

Elk Grove Policy Audit

Building Energy

Strategy	Category	Description	Supporting Activities	Source
Energy Efficiency and Electrification	*Affordable housing*	Energy conservation	Support energy-conserving programs in the production and rehabilitation of affordable housing to reduce household energy costs, improve air quality, and mitigate potential impacts of climate change in the region.	GP Policy H-2-3
	Buildings	Increase efficiency in new and existing buildings and businesses	Promote energy efficiency and energy conservation measures.	GP Policy NR-6-1 ~ 6-5
	Outreach	Educate about energy efficiency measures	Conduct public education and outreach on energy conservation, energy efficiency, and renewable energy strategies, programs, incentives, and financing options offered by SMUD and other organizations through a variety of communication methods, including the City's website, mailings or flyers, and tabling at special events.	GP Action 7.8
	Cost-savings	Support low-income residents	Work with SMUD and regional partners to promote energy efficiency upgrades and behavior change that reduces energy demand for cooling and provide cost savings for low-income residents.	CMRP 3.5-A
	Utility	SMUD support	SMUD will advocate for and support electrification policies, support cities' and county General Plans and Climate Action Plans, and connect with federal agencies and policy makers on climate action and the 2030 Zero Carbon Plan.	SMUD pg.21
			SMUD will: Evaluate grid reliability services contribution from virtual power plants, distributed energy resources, demand response and load flexibility. Perform information technology system upgrades to enable distributed energy resources (DER) and virtual power plants (VPP). Include DERs in operations, distribution and grid planning processes.	SMUD pg.21
Low Carbon Development	*Development*	Sustainability	Incorporate sustainability principles into development projects, special projects, and City plans and programs through the implementation of the Building Code, the Climate Action Plan, and best practices for sustainable development (7.1). Monitor sustainability progress (7.9) and create a web page (7.10).	GP Action 7.1, Action 7.9, Action 7.10
		Reduce emissions	Require all new development projects which have the potential to result in substantial air quality impacts to incorporate design, and/or operational features that result in a reduction in emissions equal to 15 percent compared to an "unmitigated baseline project."	GP Policy NR-4-1
Clean Energy	*Energy usage*	Solar	Encourage renewable energy use (affordable) and the use of solar energy systems (GP), integrate green roofs into city building code (CMRP)	GP Policy NR-6-6, 6-7, CMRP 3.3-C
		Renewable energy generation	SMUD will: Evaluate operational reliability requirements to manage the variability of solar and wind generation.	SMUD pg.21
	Building code	Renewable energy facilities	Conduct a review and analysis of the Municipal Code to identify provisions and regulations that may be hindering the installation of small-scale renewable energy facilities, and identify potential code amendments to remove these impediments.	GP Action 7.8

Strategy	Category	Description	Supporting Activities	Source
Green Building	*Upgrades*	Building management practices	Incorporate and support green building management practices in public and private projects.	GP Policy SD-2-1, 2-2
		Modernize facilities	Maintain, improve, and modernize existing facilities and services when necessary to meet the needs of Elk Grove residents and businesses.	GP Policy CIF-2-4
		Building code	Update the building code to incorporate higher standards for green building as required by the City's Climate Action Plan (CAP). A requirement for new single-family residential development to pre-wire for plug-in electric vehicles.	GP Action 1.7
	Strategy	Green infrastructure	Implement a Comprehensive and Climate Smart Green Infrastructure Strategy.	LHMP Action 7 (City of Elk Grove)
Climate Hazard Response	*Emergency services*	Warming centers	Establish warming centers with back-up power.	LHMP Action 48
		Cooling centers	Provide response services in the event of extreme heat (such as cooling centers)(GP). Assess if City emergency services are adequately equipped for extreme heat events, and wildfire (CMRP).	GP Policy ER-6-1, CMRP 3.4-E, F
		Guide	Develop a guide of City procedures to be followed in the event of severe weather conditions, such as excessive heat, extreme cold and heavy rain; including emergency services deployment, opening of local cooling shelters and warming shelters, and community notifications (9.10). Disseminate emergency information to residents (9.11).	GP Action 9.10, Action 9.11
		Increased resilience of population to extreme heat	Develop a strategy to work with local businesses that volunteer to serve as "cool zones" during extreme heat days and allow residents to cool off in air-conditioned spaces in these businesses (e.g., coffee shops, movie theater). Provide information about the location of these cool zones to City residents.	CMRP 3.4-C
	Outreach and coordination	Increased resilience of electricity grid to extreme heat	Work to support further adaptation and resilience efforts initiated by SMUD that affect the City. This strategy aligns with Action 2.13, "Energy Efficiency in Housing," in the GP Implementation Strategy.	CMRP 3.4-D

On-Road Transportation

Strategy	Category	Description	Supporting Activities	Source
Sustainable Transportation and Land Use Planning	*Development pattern*	Achieve a complete community	Foster development patterns that will achieve a complete community in Elk Grove, particularly with respect to increasing jobs and economic development and increasing the City's jobs-to-employed resident ratio while recognizing the importance of housing and a resident workforce.	GP Policy LU-1-2
	Infill development	Development along transit corridors	Promote a greater concentration of high-density residential, office commercial or mixed-use sites and the population along identified transit corridors and existing commercial corridors, in activity centers, and at other appropriate locations.	GP Policy LU-2-1
		Public infrastructure	Support new development within the existing City limits by investing in public infrastructure.	GP Policy LU-2-2
		Infill that supports mobility	Require new infill development projects to be compatible with the character of surrounding areas and neighborhoods, support increased transit use, promote pedestrian and bicycle mobility, and increase housing diversity.	GP Policy LU-2-4
	Activity district general components	Employment land uses	Regional Commercial and Community Commercial uses should be sited within walking distance (generally one-half mile) of planned or existing transit stops.	GP Policy LU-3-2
			Uses that may generate very high service populations (employees and/or customers) should be located within one-quarter mile of planned or existing transit stops.	GP Policy LU-3-2
		Mixed-use land uses	Publicly accessible community gathering spaces such as central plazas should be included.	GP Policy LU-3-3
			Mixed-use projects should be located within one-quarter mile of major intersections and planned or existing transit stops.	GP Policy LU-3-3
		Residential land uses	High Density Residential uses shall be located within one-quarter mile of major intersections and planned or existing transit stops.	GP Policy LU-3-4
		Public and Quasi-Public land uses	Acreages for parks shall meet or exceed the minimums required by City and/or Cosumnes Community Services District standard(s).	GP Policy LU-3-5
			Proposed development projects should maximize efficiency of service delivery. New development should be located adjacent to existing development and should be connected or linked to uses with similar service and utility needs.	GP Policy LU-3-5
			Schools, community centers, and park and recreation sites shall be connected to nearby residential neighborhoods through separated pedestrian and bicycle pathways.	GP Policy LU-3-5
			Consistent with the Park Design Principles adopted by the Cosumnes Community Services District and the City, local and neighborhood parks shall be located within residential areas and not along arterial roads. Community parks may be located on arterials.	GP Policy LU-3-5

Strategy	Category	Description	Supporting Activities	Source
	Residential neighborhood districts general components	Employment and Mixed Use land uses	Be located within one-half mile of major intersections and planned or existing transit stops.	GP Policy LU-3-6
		Residential land uses	Medium and High Density Residential uses should be located within one-half mile of planned or existing transit stops, planned or existing commercial uses, and planned or existing Parks or Open Space areas.	GP Policy LU-3-7
		Public and Quasi-Public land uses	Proposed development projects should maximize efficiency of service delivery. New development should be located proximate to existing development and should be connected or linked to uses with similar service and utility needs.	GP Policy LU-3-8
			Schools, community centers, and park and recreation sites shall be connected to nearby residential neighborhoods through separated pedestrian and bicycle pathways.	GP Policy LU-3-8
	Open Space/Conservation Districts	Public, Open Space, and Conservation land uses	In areas designed to promote open space or recreational uses over conservation uses, provide nonvehicular access points within one-half mile of all residential uses.	GP Policy LU-3-9
			Be publicly accessible and, where feasible, be integrated with surrounding land uses.	GP Policy LU-3-9
			Where feasible, provide pedestrian, bicycle, and equestrian trails in open space areas, with an emphasis on trail connections to area-wide systems.	GP Policy PT-1-12
			Maximize connectivity for both humans and animal life by connecting to an integrated network of passive and active open space corridors and uses.	GP Policy LU-3-9
		Public and Quasi-Public land uses	Proposed development projects should maximize efficiency of service delivery. New development should be located adjacent to existing development and should be connected or linked to uses with similar service and utility needs.	GP Policy LU-3-10
			Schools, community centers, and park and recreation sites shall be connected to nearby residential neighborhoods through separated pedestrian and bicycle pathways, unless such infrastructure would disrupt rural character or resource conservation efforts.	GP Policy LU-3-10
	City Expansion	Mitigate for special status species	Identify a mitigation program for critical habitat for special status species known to occur within the Study Areas. A proposed project determined to have a significant impact to habitat for special status species shall implement all feasible mitigation measures established in the program, including but not limited to land dedication (which may be located either inside or outside the corresponding Study Area) or fee payment, or both.	GP Policy LU-3-22
		Consider community benefits	Ensure that annexation proposals provide a demonstrated community benefit, such as incentives through the project that include transportation, utility, park, and other public improvements or that address mobility or service needs, or impact fees that support such improvements. The City may establish zoning incentives, density bonuses, or other land use tools where higher development potential may be allowed based on contributions toward desired community benefits.	GP Policy LU-3-24

Strategy	Category	Description	Supporting Activities	Source
	Housing	Build housing near services	Support mixed-use and high-density development applications close to existing and planned transit stops.	GP Policy MOB-5-4, 5-5
			Requirements for bicycle parking, pedestrian amenities, and transit access (as applicable) for new commercial and multifamily residential development.	GP Action 1
			Promote development where affordable housing is near services, shopping, and public transportation; included in this section are non-binding guidelines, like proximity to public transit or bus service.	GP Policy H-1-3
	Transportation Systems	Economic and land use considerations	Integrate economic development and land use planning in Elk Grove with planning for regional transportation systems.	GP Policy RC-3-1
		Transportation and community	Ensure that decisions regarding transportation between regions result in benefits to the Elk Grove community, including decisions regarding regional roadways, airport, port, and passenger and freight rail services.	GP Policy RC-3-2
		Fixed-route transit	Advocate for fixed-route transit service in Elk Grove as part of a coordinated regional network designed and routed to serve Major Employment Centers, employment, residential, and shopping centers, and colleges and universities.	GP Policy RC-3-4
		Technology	Identify and advocate for future, as yet unknown or fully developed, transportation technologies that would be of benefit to Elk Grove and surrounding regions.	GP Policy RC-3-5, GP Policy MOB-7-8
	Vehicle Miles Traveled Limits	Metrics and limits	Achieve State-mandated reductions in VMT by requiring land use and transportation projects to comply with the following metrics and limits. (Read subsections (a) and (b) for specific requirements.)	GP Policy MOB-1-1, a, b
		Guidelines	Prepare and regularly update guidelines for the preparation of transportation impact analyses for consistency with vehicle miles traveled (VMT) policies.	GP Action 1.4
	Roadway Performance Targets		Consider all transportation modes and the overall mobility of these modes when evaluating transportation design and potential impacts during circulation planning.	GP Policy MOB-1-2
			Strive to implement the roadway performance targets (RPT) for operations of roadway segments and intersections, while balancing the effectiveness of design requirements to achieve the targets with the character of the surrounding area as well as the cost to complete the improvement and ongoing maintenance obligations.	GP Policy MOB-1-3

Strategy	Category	Description	Supporting Activities	Source
Mobility	*Complete Streets*	User inclusivity	Consider all users when designing streets, connect existing street infrastructure, reduce single-occupancy travel, etc.	GP Policy MOB-3-1 ~ MOB-3-9
		Analysis	Conduct a citywide analysis to identify streets that can be made "complete" through a reduction in the number or width of travel lanes (consistent with the Transportation Plan) or other means, with consideration for emergency vehicle operations. Consider including new bikeways, sidewalks, and exclusive transit lanes on appropriate streets by rearranging and/or reallocating how the available space within the public right-of-way is used. Use the results of this analysis to update public road standards.	GP Action 4.4
	Street Design	Safety and reduce traffic	Continue to design streets and approve development applications in a manner that reduces high traffic flows and parking demand in residential neighborhoods.	GP Policy MOB-3-13
	Parking	Discourage parking	Utilize reduced parking requirements, establish parking maximums, ensure bike parking in new residential developments, etc.	GP Policy MOB-3-14 ~ MOB-3-17
		Parking requirements to match reduced vehicle ownership	Update the City's zoning code to allow for shared parking districts to reduce the total land required for parking in residential and nonresidential land uses. Identify areas in the City to promote or require park-once-and-walk districts to increase the total potential land available for building footprints.	CMRP 2.4 A-1
	Bicycle and Pedestrian Network	Increase non-vehicle travel	Improve existing bicycle and pedestrian infrastructure, encourage employers to incentivize non-vehicle travel, increase comfortability of using non-vehicle infrastructure, etc.	GP Policy MOB-4-1 ~ MOB-4-5, HTH-1-3, LHMP Action 9 (City of Elk Grove), GP Action 4.12
		Prioritize pedestrian and bicyclist travel	Employ the recommendations and guidelines in the Bicycle, Pedestrian, and Trails Master Plan when planning and designing bicycle, pedestrian, and trail facilities and infrastructure, including updates to the Capital Improvement Program. (This includes walk and bike audits, increased bike parking, curb management, etc.). Update the BPTMP (GP).	GP Policy MOB-4-4, BPTMP Recommendations Section (start pg.45), GP Action 4.5
		Resiliency to heat	Incorporate projections of future extreme heat impacts into the design and development of pedestrian and bicycle infrastructure in the City.	CMRP 3.2-B
	Transit	Employee access to transit	Coordinate planning efforts related to future Major Employment Center(s) in Elk Grove with local and regional transit providers, including e-Tran, Sacramento Regional Transit District, and Amtrak.	GP Action 4.11
			Encourage employee-intensive commercial and industrial uses to locate within walking distance of fixed transit stops. Encourage regional public transit providers to provide or increase coordinated services to areas with high concentrations of residents, workers, or visitors.	GP Policy LU-1-9

Strategy	Category	Description	Supporting Activities	Source
		Improve infrastructure for transit	Support projects that could support transit, in addition to promoting corridor connections and maintenance of transit systems and reducing single vehicle occupancy.	GP Policy MOB-5-1, MOB-5-7 ~MOB-5-13, MOB 7-10, NR-4-6
			Undertake a comprehensive review of current public transit service periodically as needed, including transit routes, stops, and frequencies, and solicit transit rider input on these topics. Consider potential transit service improvements, modifications, and expansions in the context of future land use patterns and growth areas as designated in the General Plan.	GP Action 4.6
			When reviewing applications for development projects located along planned future bus rapid transit and/or light rail lines to serve planned employment centers, require property owners to dedicate right-of-way for these future transit lines. The City's Capital Facilities Fee (CFF) provides credit or reimbursement to property owners for such dedication.	GP Action 1.9
			Incentivize the use of environmentally friendly road materials, support facilities that will supply renewable charging.	GP Policy MOB-7-9, 7-11
			Evaluate e-Tran's Transportation Demand Management (TDM) Program periodically as needed, and update/modify the program to incorporate new and innovative TDM strategies based on current best practices.	GP Action 4.1
		Increase the appeal of rail	Advocate for the City's preferred fixed transit alignment for light rail or bus rapid transit from north of the city to the Southeast Policy Area and ensure proposed projects are complementary to such an alignment	GP Policy MOB-5-2
			Consult with the Sacramento Regional Transit District when identifying and designing complete streets improvements near likely light rail alignment corridors in order to prioritize access to and use of transit to sites along that corridor.	GP Policy MOB-5-3
			Encourage commuter rail transportation by providing for a potential train station location for Amtrak and/or other rail service providers along the Union Pacific Railroad's Sacramento Subdivision line.	GP Policy MOB-5-11
			Regulate truck travel as appropriate for the transport of goods, consistent with circulation, air quality, congestion management, and land use goals.	GP Policy MOB 6-4

Strategy	Category	Description	Supporting Activities	Source
	Emissions	Reduce mobile source emissions	Implement and support programs that reduce mobile source emissions.	GP Policy NR-4-3, 4-5
			Develop incentives and compile information to encourage property owners of existing gas stations to install facilities for alternative/clean fuels, such as hydrogen and biodiesel.	GP Action 4.9
		Encourage alternative modes of transport	Promote pedestrian/bicycle access and circulation to encourage residents to use alternative modes of transportation in order to minimize direct and indirect emissions of air contaminants.	GP Policy NR-4-4
			Work with SACOG to disseminate information about commuter alternatives and TDM resources and incentives to residents and employers in Elk Grove.	GP Action 4.3
Low- and Zero-Emission Vehicles	*Electric Vehicles*	Promote charging infrastructure	Identify charging opportunity sites, work with stakeholders and new retail developments to promote EV infrastructure, provide technical assistance to new retail developments to achieve sustainable business models.	CMRP 2.4 A-2
			SMUD will: Launch new customer-partner pilot programs for VPP Involving thermostats, EVs, rooftop solar and batteries. Launch pilots for behavioral demand response "Flex Alert", EV managed charging and vehicle-to-grid demonstrations.	SMUD pg.21
			Requirement for new commercial and multifamily residential developments to provide electric vehicle (EV) charging stations (appropriate number based on commercial square footage or number of residential units). Development incentives for EV charging infrastructure for alterations to existing residential and commercial facilities.	GP Action 1, Action 4.10
		Road charge pilot programs	Promote participation in road charge pilot programs.	CMRP 2.4 A-4
		Equitable implementation	Work with local elected officials and community organizations to lobby for the equitable implementation of a road charge program that offsets the City's revenue loss from a decrease in gas sales and that does not disproportionately affect residents with long commute lengths.	CMRP 2.4 A-4
	Revenue	Tax strategies	Explore and implement tax strategy to offset lost revenue from decreases in vehicle-related sales tax revenue.	CMRP 2.4 B-2
	Heat impacts	Impact on transit	Incorporate projections of future extreme heat impacts into the transition to electric buses and the purchase of new transit vehicles as part of the Innovative Clean Transit regulations.	CMRP 3.2-A

Solid Waste

Strategy	Category	Description	Supporting Activities	Source
Landfill	*Recycling*	Reduce waste to landfill	Facilitate recycling, reduction in the amount of waste, and reuse of materials to reduce the amount of solid waste sent to landfill from Elk Grove.	GP Policy CIF-1-1
Zero-Waste		Educate	Reduce municipal waste through recycling programs and employee education.	GP Policy CIF-1-2
	Resource efficiency	Inform businesses	Encourage businesses to emphasize resource efficiency and environmental responsibility and to minimize pollution and waste in their daily operations.	GP Policy CIF-1-3

Water

Strategy	Category	Description	Supporting Activities	Source
Recycled Water	*Stormwater*	Integrate sustainable stormwater management techniques	Where feasible, require on-site natural systems such as vegetated bioswales, green roofs, and rain gardens in the treatment of stormwater to encourage infiltration, detention, retention, groundwater recharge, and/or water reuse on-site.	GP Standard LU-5-13.a, ER-6-8, CMRP 3.3-E
		Minimize erosion	Include vegetation to increase stormwater retention, design roads to minimize erosion.	GP Standard NR-3-2.a-c
		Repurposing runoff	Elk Grove Green Street Project: Repurposing Urban Runoff with Green Instructure Technologies.	LHMP Action 3 (City of Elk Grove)
		Infrastructure	Update stormwater infrastructure and facilities, add redundancy to the system, increase the durability of materials/roadways.	CMRP 3.1-E, 3.1-F, SE SA-29, GP Policy ER-2-18
		Planning	Develop a comprehensive plan and set targets to decrease stormwater runoff from existing residential and nonresidential land uses, as well as City facilities, through green infrastructure approaches. This strategy aligns with GP Implementation Strategy Action 1.8, "Sustainable Stormwater Management Ordinance."	CMRP 3.3-E
		Ordinance	Prepare and adopt a Sustainable Storm water Management Ordinance that sets design standards for on-site storm water management for new construction of public and private projects.	GP Action 1.8
		Runoff control measures	The City shall require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing Comprehensive Drainage Plans.	SE SA-28, GP Policy ER-2-17
		Permeable pavements	Assess feasibility of incorporating permeable pavements into aspects of the City's infrastructure to decrease stormwater runoff impacts during storm events.	CMRP 3.3-G
		Planning	Implement Storm Drain Capital Improvement Plan (Sacramento County 38). Create a Climate-Smart Stormwater Management System (City of Elk Grove 6).	LHMP Action 6, 38
	Greywater	Irrigation	Promote the use of greywater systems and recycled water for irrigation purposes.	GP Policy NR-3-10
	Partnerships	Infrastructure	Work with Regional San and SCWA to expand recycled water infrastructure for residential, commercial, industrial, and recreational facilities and support the use of reclaimed water for irrigation wherever feasible.	GP Policy INF-1-4

Strategy	Category	Description	Supporting Activities	Source
Water Conservation	*Buildings/Facilities*	General upkeep and communication	Eliminate water inefficiencies, maintain communication with suppliers and encourage environmentally friendly design of recycled water facilities.	GP Policy NR-3-8, 3-14
		Reduce water use	Reduce residential and non-residential water use (in compliance with water conservation measures).	GP Policy NR-3-9
		Building upgrades	Promote upgrades to existing buildings to support water conservation.	GP Policy NR-3-12
		Help customers conserve water	Work with the Sacramento County Water Agency, Elk Grove Water District, and other water utilities to support programs and conservation activities intended to help water customers voluntarily conserve approximately 10 percent over time.	GP Policy ER-6-6
	Outreach	Educate about water conservation measures	Work with Elk Grove Water District, Sacramento County Water Agency, and other water providers to inform the public of mandatory water use restrictions and to encourage voluntary water conservation measures.	GP Action 7.2
			Conduct public education and outreach on water conservation and efficiency strategies, programs, and incentives offered by water purveyors and other organizations through a variety of communication methods, including the City's website, mailings or flyers, and tabling at special events.	GP Action 7.3
	Landscape	Ordinance	Enforce the City's water-efficient landscape ordinance that is as strict as or stricter than the State Water Resources Control Board regulations affecting local water agencies and ensure future state updates are incorporated in some form to the City's ordinance. Provide opportunity for and encourage public reporting of violations.	GP Policy ER-6-7
		Native plant ordinance	Work with the City's landscape architect to develop a handout for project applicants listing recommended drought-tolerant and native tree and plant species to be used in site and landscape design for development projects. Review landscape plans for development projects to ensure the selected plants are appropriate and meet the requirements of the City's Water Efficient Landscape Ordinance.	GP Action 1.10
	Drought	Affect on transportation	Assess vulnerabilities and potential impact to the City's transportation assets from a long-term drought scenario.	CMRP 3.1-B ~3.1D

Strategy	Category	Description	Supporting Activities	Source
Hazards	*Flooding*	Upgrades to infrastructure	Work with State and regional partners to explore options and costs for conducting a hydraulic study of waterways in the City that incorporates future intensities of large regional storm events, evaluate upgrades to levee system, and flooding warning systems.	CMRP 3.1-G ~ 3.1-I, 3.2-E, GP Action 9.6
			Upgrade the City's Laguna West Levee System to Mitigate Climate-Related Flood Impacts.	LHMP Action 8 (City of Elk Grove)
		Planning	Flood mapping and management.	LHMP Action 18, 29, 30, 32
		Traffic signal system	Analyze the City's traffic signal system to identify key points of sensitivity to flooding, identify railway that is vulnerable to flooding.	CMRP 3.2-D, 3.2-E
		Elevation and construction standards	In coordination with future updates to the Central Valley Flood Protection Plan (per Senate Bill 5), continue to assess Urban Level of Protection for properties in the City and update the City's elevation and construction standards accordingly for new construction.	CMRP 3.3-F
		Prevent alteration of river flow	The City opposes the construction of flood management facilities that would alter or reduce flows in the Cosumnes River and supports retention of the Cosumnes River floodplain in non-urban uses consistent with location in an area subject to flooding.	SE SA-12
		Prevent placement of buildings in flood areas	The construction of facilities and flood management projects shall not increase the risk of flooding, be located within 100-200 year flood hazard zones, and meet one or more flood protection findings.	SE SA-13 ~SA-27, GP Policy ER-2-3 ~ 2-10
			Require that all new projects not result in new or increased flooding impacts on adjoining parcels or on upstream and downstream areas.	GP Policy ER-2-2
		Mitigation	Mitigation of repetitive loss flood areas and properties.	LHMP Action 15, 17
		Prevention	Update hydrology standards (33) and use aggregate mining pits for flood control (37).	LHMP Action 33, 37
			Elevate houses to reduce flood risk.	LHMP Action 28
			Review the 200-year floodplain on an annual basis and prepare updates as necessary using available data sources. Updated information shall be made available and referenced during the development review process for areas within the 200-year floodplain.	GP Action 9.5
		Adaptation	Where necessary due to clear dangers to life or property, the City will support the construction of flood hazard management projects.	GP Policy ER-2-15

Miscellaneous

Strategy	Category	Description	Supporting Activities	Source
Urban Design	*Utility*	Requiring undergrounding of services within urban areas of the city	New utility facilities should be located underground to the extent possible. Facilities to be placed underground should include electrical transformers (where consistent with the guidelines of the electrical utility), water backflow preventers, and similar items.	GP Standard LU-5-3.a
			Require that existing overhead utility facilities be undergrounded as a condition of project approval. This shall include electrical service lines under 69kV. Electrical service lines of 69kV and higher are encouraged to be undergrounded.	GP Standard LU-5-3.b
	Building Standards	Design standards shall address new construction and the reuse and remodeling of existing buildings.	Nonglare glass shall be used in all nonresidential buildings to minimize and reduce impacts from glare. Buildings that are allowed to use semi-reflective glass must be oriented so that the reflection of sunlight is minimized. This requirement shall be included in subsequent development applications.	GP Standard LU-5-4.a
	Public Spaces	Right-of-way	When resources are available, seek to enliven the public right-of-way with attractive landscaping, public art, lighting, civic landmarks, sidewalk cafés, gateways, water features, interpretive/wayfinding signage, farmers markets, festivals, outdoor entertainment, pocket parks, street furniture, plazas, squares, or other amenities in spaces for public use.	GP Policy LU-5-6
		Access to spaces	Encourage incorporation of publicly accessible spaces, such as plazas or squares, into new commercial and mixed-use developments.	GP Policy LU-5-7
		Amenities	Require developers to provide pedestrian amenities, such as trees, lighting, recycling and refuse containers, seating, awnings, and/or art, in pedestrian areas along project frontages. Where appropriate, install pedestrian amenities in public rights-of-way.	GP Policy LU-5-8
		Prioritize the pedestrian	Minimize parking areas and curb cuts along commercial street frontages, provide pedestrian amenities such as lighting, landscaping, and benches.	GP Standard LU-5-9.a
		Pavement design	Research options and upgrade the City's Construction Specification Manual and Improvement Standards Manual to better adapt to increases in extreme heat days and heat wave events.	CMRP 3.1-A

Strategy	Category	Description	Supporting Activities	Source
Green Business and Jobs	*Major Employment Center Designation*	Public infrastructure	Continue to invest in public infrastructure to attract target industries to Elk Grove, such as improved broadband capacity and reliability, road construction and maintenance, public transit, new and upgraded public utilities, and adequate community services.	GP Policy RC-1-3
		Access to the center	In addition to establishing a primary Major Employment Center (see Policy RC-1-1), consider options to develop additional employment centers in portions of the City with enough available undeveloped land and potential sufficient transit access to support such a center.	GP Policy RC-1-5
Urban Forestry and Open Space	*Public Spaces*	Increase tree canopy	Maximize canopy coverage and maintain tree health on public lands, promote tree planting on private land.	GP Policy NR-2-2 ~ 2-7, CMRP 3.3-B
			Conduct regular assessments of the urban forest to determine extent, health, condition, and progress toward shade cover objectives. Design sidewalks and streets with more space for trees.	UFCA Rec.1
Carbon Emissions	*City Goals*	Reduce emissions	By 2030, reduce per capita emissions greenhouse gas emissions to 4.1 MTCO2e. By 2050, reduce per capita greenhouse gas emissions 1.4 MTCO2e to meet the State's 2050 greenhouse gas emissions reduction goals.	GP Policy NR-5-1
		Enhance carbon sequestration	Preserve, protect, and enhance, as appropriate, the community's carbon sequestration resources to improve air quality and reduce net carbon emissions.	GP Policy NR-5-4, CMRP 3.3-B, LHMP Action 9
Urban Heat Island Reduction	*Roadways*	Increase albedo	In construction of new roadways, utilize cool pavements and higher-albedo impervious materials as well as trees and foliage along rights-of-way.	GP Policy ER-6-4, CMRP 3.3-A
	Infrastructure	Cool communities	Reduce the urban heat island effect through the implementation of "cool communities" strategies, including but not limited to, increasing tree plantings, using cool/green roofs and cool/pervious pavements.	LHMP Action 43
Strategies	*Resiliency*	Planning	Identify the three most substantial threats to the community, be they environmental (e.g., flooding, drought, earthquakes), economic (e.g., changes in employment conditions or tax base), social (e.g., housing affordability, social equality), or other aspects and develop strategies to plan, prepare, adapt, and recover for/to/from these changes (7.11). Create a climate change specific Resiliency Plan (9.2).	GP Action 7.11, Action 9.2
Wildfire	*Buildings*	Prevention programs	Work with the CCSD to develop high visibility fire prevention programs, including those which provide voluntary home inspections and awareness of home fire prevention measures.	GP Action 9.7

Municipal

Emissions Sector	Strategy	Category	Description	Supporting Activities	Source
Sustainable Transportation	*Transit System Improvement*	Infrastructure incorporation	Project designs and additions	The City shall work to incorporate transit facilities into new private development and City project designs including incorporation of transit infrastructure (e.g. electricity and fiber-optic cable), alignments for transit route extensions, new station locations, bus stops, and transit patron waiting area amenities (e.g. benches and real-time traveler information screens).	GP Policy MOB-5-6
Water	*Efficiency*	Facilities	Education and retrofits	Improve the efficiency of water use at City facilities through retrofits and employee education.	GP Policy NR-3-11
Building Energy	*Low Carbon Development*	Facilities	Reduce emissions	Minimize air pollutant emissions from all City facilities and operations (including in-house and contracted) to the extent feasible and consistent with the City's need to provide a high level of public service.	GP Policy NR-4-2
			Increase efficiency	Improve energy efficiency by identifying savings measures for City facilities in building materials and operations.	GP Policy NR-6-2
	Clean Energy	Facilities	Solar energy	Encourage solar energy systems in City facilities.	GP Policy NR-6-7
	Climate Hazard Response	Capital improvement projects	Flooding preparedness	Incorporate updated precipitation and storm intensity data into the City's capital improvements planning process, specifically projects in areas anticipated to be impacted by future flood events.	CMRP 3.4-H
Sustainable Transportation	*Transportation Systems*	Incentive	Alternative transport	Establish an incentive program for City employees to encourage the use of alternative transportation for commuting.	GP Action 4.2