



6 Climate Change

In 2015, the State of California adopted Senate Bill 379 (Land Use: General Plan: Safety Element) which requires all general plan updates to include a climate change vulnerability assessment, measures to address these vulnerabilities, and a comprehensive hazard mitigation and emergency response strategy.

While greenhouse gas emissions (GHGs) are not required by statute to be addressed in the general plan, they are required to be addressed in the California Environmental Quality Act (CEQA) analysis prepared for the general plan. Additionally, the State has adopted several bills requiring jurisdictions to meet greenhouse gas emissions reduction targets in order to contribute to the overall State reduction targets. Local governments have the choice of developing an optional Climate Change Element or addressing climate change and GHG mitigation strategies in the other required elements. Rohnert Park has elected to prepare a stand alone Climate Change Element to satisfy the legal requirements of Senate Bill 379, facilitate the CEQA analysis for the General Plan and support implementation of the various measures to reduce GHGs and mitigate the anticipated impacts of changing climate.

The Climate Change Element identifies the sources of GHGs in the city and seeks to lay out specific strategies for mitigating and adapting to climate change impacts. It contains an inventory of greenhouse gas emissions from 2010 and 2015, a forecast of GHG emissions under several future scenarios and a suite of goals, policies, and actions to reduce GHG emissions. The Element also outlines expected climate-related changes to natural hazards throughout the life of the General Plan, and climate adaptation strategies to mitigate these changes. Adaptation to climate change impacts include addressing increasing risk of extreme heat days, extreme precipitation events and droughts, flooding, wildfires, and an increasing average temperature over the coming decades. In alignment with the Local Hazard Mitigation Plan (LHMP), this

Element discusses the city's vulnerabilities to climate hazards and what potential actions can be taken to mitigate impacts when these events occur.

While the majority of the City's climate change goals and policies are included in this Element, goals and policies in the Community Development Element, Circulation Element, the Public Facilities and Services Element, the Resource Conservation Element and the Health and Safety Element will also play a role in the City's overall climate change mitigation plan, and an icon is used to illustrates the policies and actions in other Elements that support Climate Change mitigation and adaptaion.

When successfully implemented, the goals, policies, and action in the Climate Change Element will result in four benefits for the City.

- A Resilient Economy: Transitioning to clean, efficient, and renewable energy sources, making the economy more resilient to unpredictable events and create local clean energy jobs.
- Regional Leadership in Sustainability: Encouraging effective collaboration throughout the community and cooperation with neighboring jurisdictions to promote collective change.
- Environmental Justice: Protecting those most vulnerable against the impacts of climate change by directing resources and efforts effectively.
- Legal Compliance: California has ambitious mandates and standards for addressing climate change and greenhouse gas emissions that must be addressed in the City's General Plan, in order to ensure that the General Plan can be used as an effective guide for decision-making.

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6.1 Climate Change at-a-Glance

The effects of climate change are being felt in the City of Rohnert Park and the greater Sonoma County area in the form of extended droughts, larger and more frequent destructive wildfires, heavy precipitation events and “atmospheric rivers,” and an increasing number of extreme heat days. These weather-related events require the City to prepare adaptation strategies to better protect their communities by moderating risk and maximizing benefits. Implementing climate adaptation strategies and reducing GHG's are the primary ways to mitigate and reduce the impacts of climate change as they unfold.

6.2 Greenhouse Gas Emissions

The State of California has set statewide GHG emissions reduction goals to mitigate negative climate change impacts and transition the State to a low-carbon economy. In particular, the State has set goals to reduce statewide GHG emissions to 1990 levels by 2020, as established by Assembly Bill (AB) 32, and 40 percent below 1990 levels by 2030, as established by Senate Bill (SB) 32. The 2020 goal set by AB 32 was achieved by the State in 2016 (CARB 2018). In addition, Executive Order (EO) B-55-18 established a State goal of carbon neutrality by 2045. The California Air Resources Board (CARB) is the agency responsible for addressing these goals. One area where local governments can strive to meet their fair share in meeting the State's GHG reduction goals is through requirements in CEQA documents for local projects, including meeting GHG targets or thresholds in the General Plan CEQA analysis.

Historic GHG Emissions Inventories

The Sonoma County Regional Climate Protection Authority (RCPA) developed two communitywide GHG inventories for Rohnert Park for the years 2010 and 2015. Based on these inventories, GHG emissions in Rohnert Park decreased from 2010 to 2015, primarily as a result of joining the Sonoma Clean Power program, which provides nearly all of the city's energy from carbon free sources. Communitywide emissions in 2010 were 9 percent below 1990 levels, and this percentage increased to about 10 percent below 1990 levels in 2015. This slight downward trend in Rohnert Park emissions matches the countywide trend. Even though the energy sector implemented a significant reduction in GHG emissions, the transportation sector emissions grew comparably, limiting the overall reduction in GHG emissions.

The General Plan uses the 2015 GHG inventory as the baseline year for analysis. The baseline year is used as a point of comparison so that the City of Rohnert Park can clearly see how effective greenhouse gas reduction measures are at reducing GHGs in the city. The inventory presents carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) emissions generated from activities in the city including activities by residents, businesses, city operations, and construction. These three gases comprise the emissions of interest to the City for the implementation of targeted GHG reduction strategies to meet local and State goals.

2010 GHG Inventory Summary

Greenhouse gas emissions are measured in metric tons of carbon dioxide equivalent (MTCO₂e). This is the commonly used metric for comparing other greenhouse gases and their global-warming potential (GWP) to carbon dioxide, which is used as the baseline gas for understanding the impact of emissions on the global climate. This is done by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

The emissions sources that were calculated for the 2010 GHG Inventory for 2010 are shown in Figure 6-1 and Table 6-1, and include on-road transportation; building energy use; solid waste; off-road transportation; and equipment, water, and wastewater. The on-road transportation sector is the largest source of GHG emissions for the city at 62 percent of the total. Following transportation, building energy use makes up the second most at 32 percent of total emissions. The remaining contributor sources in order of largest to smallest are solid waste, off-road transportation and equipment, and water and wastewater. The water and wastewater sectors do not contribute substantially to GHG emissions because these utilities converted to Sonoma Clean Power's "Evergreen Program" shortly after it became available.

Figure 6-1 2010 Community GHG Emissions Inventory by Source

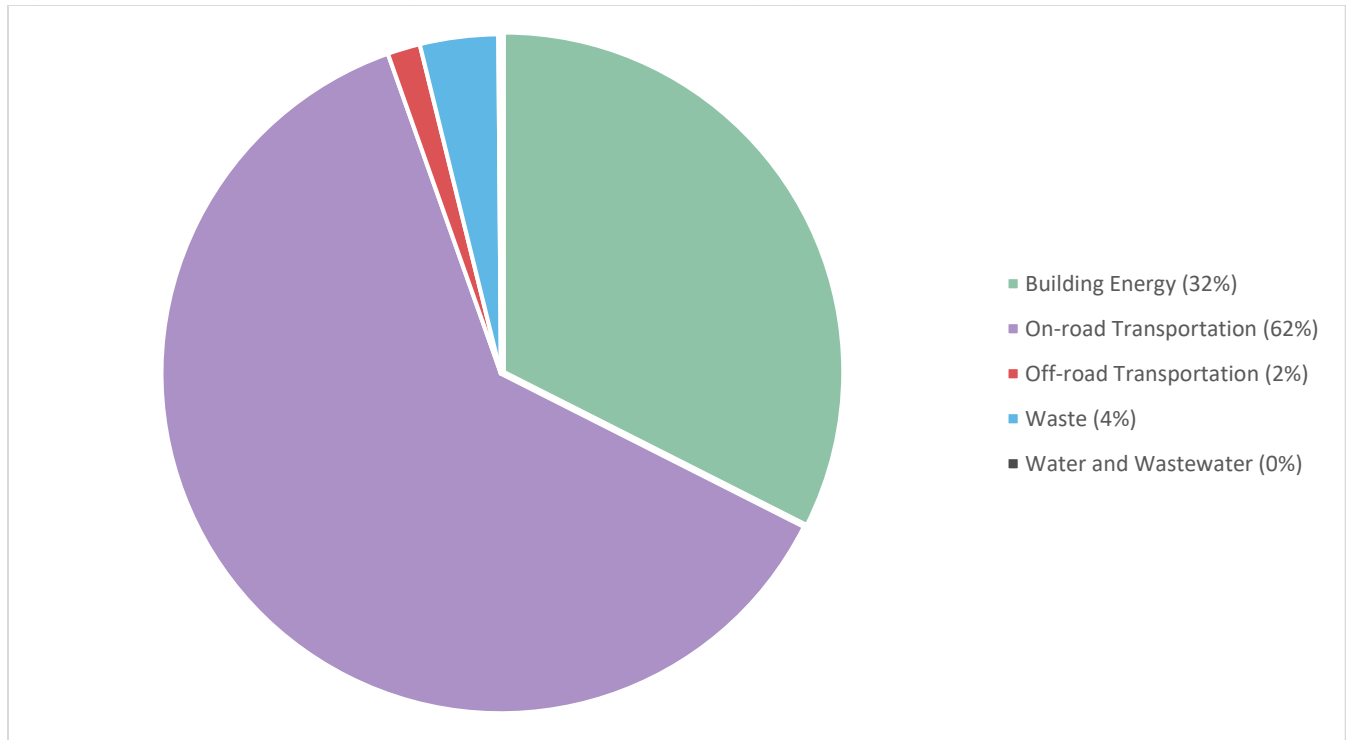


Table 6-1 2010 GHG Inventory Results for Rohnert Park

Sector	Emissions (MT CO ₂ e)	Contribution to Total (%)
On-road Transportation	164,228	62.1%
Building Energy	85,749	32.4%
Waste	9,840	3.7%
Off-road Transportation	4,117	1.6%
Water and Wastewater	329	0.1%
Total	264,263	-

2015 GHG Inventory Summary

The 2015 inventory includes the same sectors as the 2010 inventory, with a further breakdown of building energy use to residential electricity, commercial electricity, residential natural gas, and commercial natural gas, as shown in Figure 6-2 and Table 6-2. The on-road transportation sector remained the largest source of GHG emissions for the city at 67 percent of the total. Following transportation, building energy use makes up the second most at 27 percent of total emissions. The remaining contributor sources in order of largest to smallest are solid waste: off-road transportation and equipment; and water and wastewater. The water and wastewater sectors remained very low contributors to overall emissions because of the commitment to the Evergreen Program.

Figure 6-2 2015 Community GHG Emissions Inventory by Source

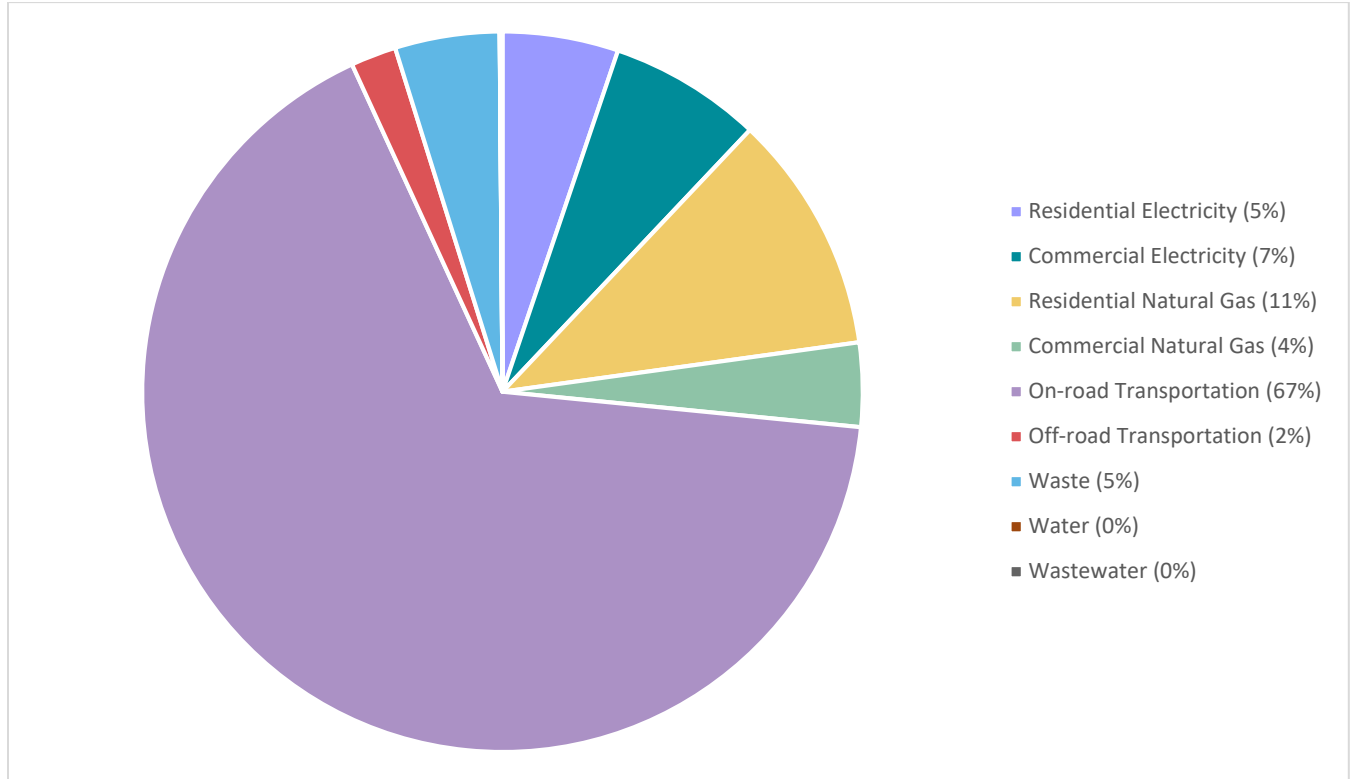


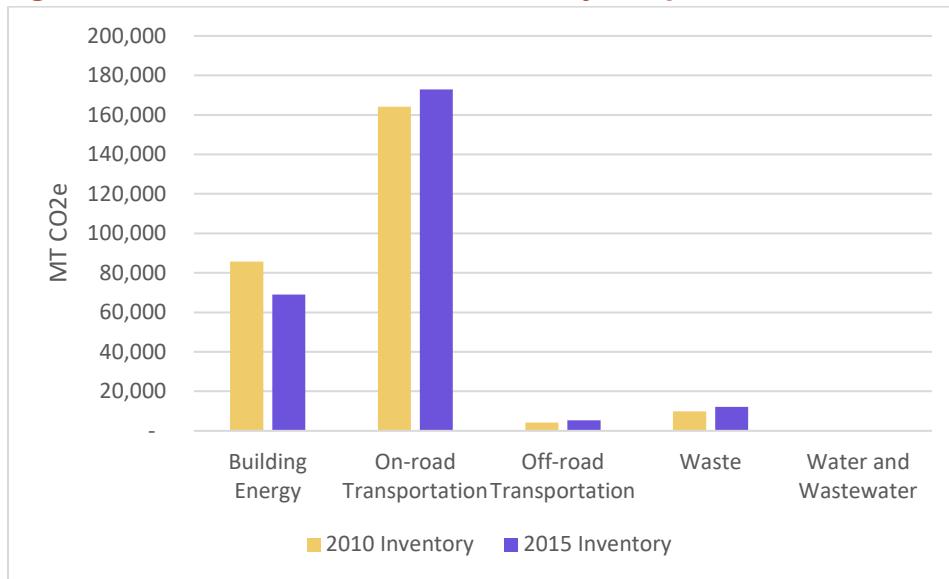
Table 6-2 2015 GHG Inventory Results for Rohnert Park

Sector	Emissions (MT CO ₂ e)	Contribution to Total (%)
On-road Transportation	172,859	66.6%
Residential Natural Gas	27,921	10.8%
Commercial Electricity	17,802	6.9%
Residential Electricity	13,495	5.2%
Waste	12,183	4.7%
Commercial Natural Gas	9,779	3.8%
Off-road Transportation	5,305	2.0%
Water	13	0.0%
Wastewater	311	0.1%
Total - Absolute Emissions	259,667	-
Total - Per Capita Emissions	6.23	-

Change between 2010 and 2015 Community GHG Emissions Inventory

Between 2010 and 2015, the transportation sector remained the largest source of GHG emissions for the city and grew 5 percent, as shown in Figure 6-3. Solid waste had an increase in GHG emissions of about 24 percent between 2010 and 2015, while GHG emissions from building energy decreased by 26 percent. This large reduction in the building energy sector is due to the City’s enrollment in the Sonoma Clean Power Program, which transferred a large portion of the community’s PG&E electricity accounts to Sonoma Clean Power. Sonoma Clean Power procures about 97 percent of its energy from carbon-free sources, including large hydro, wind, solar, and geothermal.

Figure 6-3 2010 and 2015 GHG Inventory Comparison



1990 GHG Emissions BackCast

The State’s GHG emissions reduction goal for 2030 (i.e., SB 32) was established based on a percentage reduction from 1990 levels. Because the City does not have a 1990 emissions inventory, a “back-cast” was developed to support the development climate action targets that are consistent with State policies. The back-cast was developed by establishing a relationship between GHG emissions at the state level for 2015 compared to 1990 and applying that change factor to Rohnert Park’s 2015 GHG emissions. This calculation is illustrated in Table 6-3 and illustrates that the city’s 2015 emissions were below 1990 levels.

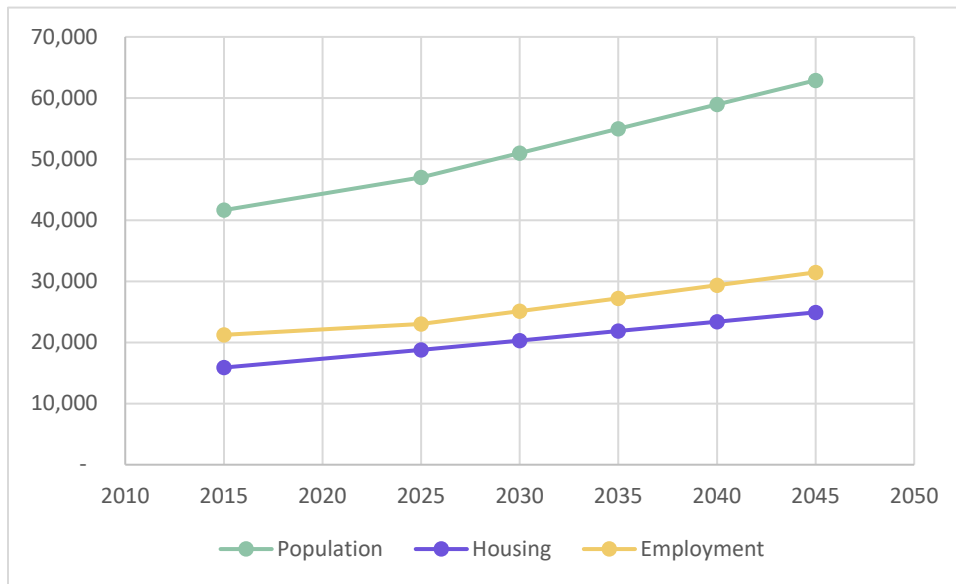
Table 6-3 1990 GHG Emissions Back-Cast for Rohnert Park

2015 Rohnert Park GHG Emissions (MT CO ₂ e)	259,667.48
2015 to 1990 State GHG Emissions Change Factor (%) ¹	(-2.23%)
1990 Rohnert Park GHG Emissions (MT CO₂e)	265,449.20
1990 Rohnert Park Population	36,326
1990 Rohnert Park Per Capita Emissions (MT CO₂e/person)	7.31
1. Change factor calculated as the percent difference between 1990 and 2015 state-level emissions. The State emitted 298.60 million MT CO ₂ e in 2015 compared to 305.4 million MT CO ₂ e in 1990 in the relevant emissions sectors, a 2.20 percent decrease between 1990 and 2015.	

GHG Emissions Forecast

A communitywide forecast of GHG emissions and future climate action targets were developed for Rohnert Park based on the historic GHG inventories. The forecast was developed for Rohnert Park for years 2025, 2030, 2035, 2040, and 2045, as required by State goals. These forecasts are based on the General Plan buildout projections for population, housing, and employment through 2040 illustrated in Figure 6-4.

Figure 6-4 Demographics Projections for Rohnert Park (2015-2045)

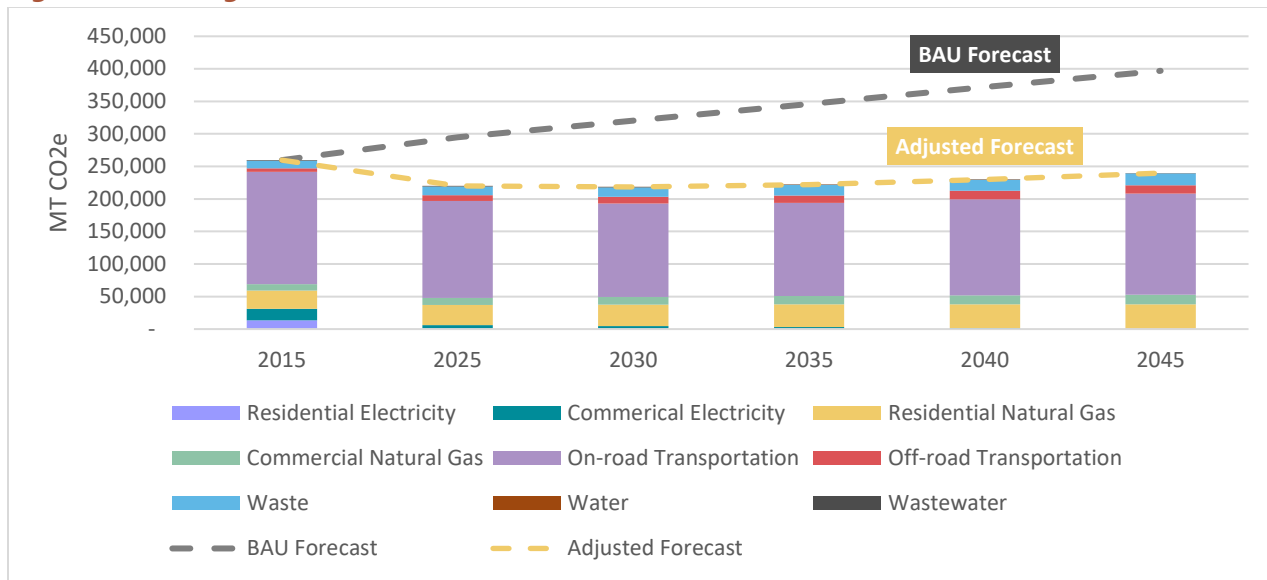


The forecast included two forecast scenarios, as described below.

- **BAU (Business-as-Usual)** forecast scenario projects the expected growth in all emission sectors based on job and population growth alone.
- **Adjusted** forecast accounts for job and population growth and additionally quantifies and incorporates all State-level legislative reduction programs that are expected to help reduce California's, and therefore Rohnert Park's, GHG emissions between 2030 and 2045. Each of the state-level legislative programs incorporated into the adjusted forecast was incorporated because the State has established concrete pathways for implementation that have shown demonstrated success. The adjusted forecast provides a more accurate picture of projected future emissions growth for Rohnert Park.

Figure 6-5 compares the emissions that are expected to result from each of these scenarios.

Figure 6-5 Figure CC-5 GHG Emissions Forecast for Rohnert Park



The State-level legislative reduction programs incorporated into the adjusted forecast include Advanced Clean Cars Program, California's Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations Title 24), and the California Renewable Portfolio Standard (RPS):

- The **Advanced Clean Cars Program**, approved by CARB in January 2012, coordinates the goals of the Low Emissions Vehicles, Zero Emissions Vehicles, and Clean Fuels Outlet programs, and is more stringent than the Federal corporate average fuel economy (CAFE) standards. The new standards will reduce Californian GHG emissions by 34 percent in 2025.
- California's **Energy Efficiency Standards for Residential and Nonresidential Buildings** (Title 24), adopted in 1978, determine energy efficiency standards for new development in California. The California Energy Commission estimates the 2019 standards will reduce consumption by 34 percent for residential buildings and 30 percent for commercial buildings, relative to the 2016 standards, for new development projects implemented after January 1, 2020.
- The **California Renewables Portfolio Standard (RPS)** requires retail electricity providers to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2026, 60 percent of total procurement by 2030, and 100 percent of total procurement by 2045. These standards will reduce electricity emissions in California to zero by 2045.

Other existing programs and potential new programs may aid in reducing GHG emissions in Rohnert Park. The Short-Lived Climate Pollutant Reduction Strategy program will reduce organic waste sent to the landfill, which will reduce GHG emissions by reducing methane production. Executive Order (EO) N-75-20 requires that all new cars and passenger trucks sold in California by 2035 be zero-emission vehicles. These programs were not incorporated in the adjusted forecast because of uncertainty around how they will be implemented and to what extent they will be enforced.

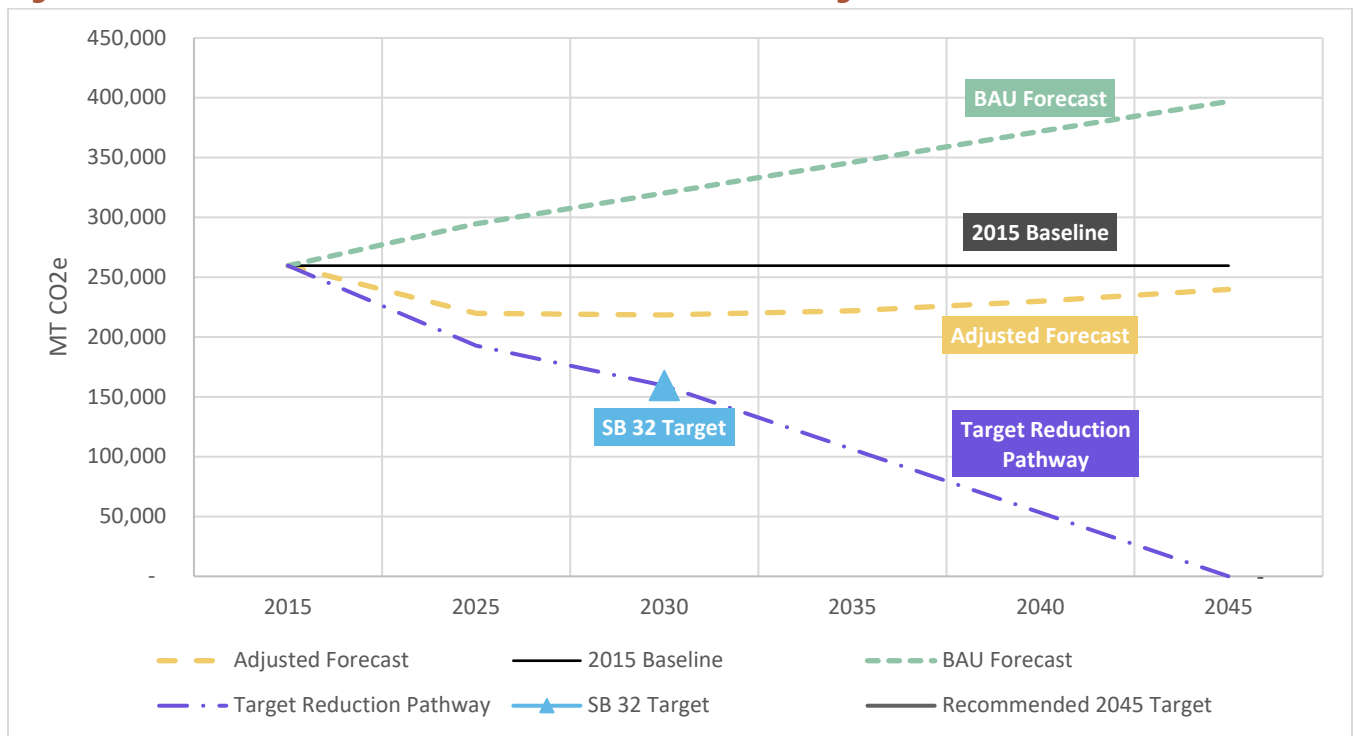
Based on the forecast, State-level legislative reduction programs are expected to reduce GHG emissions in Rohnert Park by 31 percent in 2030, and 39 percent in 2045, primarily because of the California Renewable Portfolio Standard. In 2030, transportation emissions are still expected to be the largest contributor to overall emissions (65 percent), followed by building energy (23 percent), waste, and off-road transportation. Water

and wastewater activities are not expected to contribute significantly to emissions. In 2045, transportation emissions are expected to account for 64 percent of emissions, followed by building energy (22 percent), waste, and off-road transportation. By 2045, only natural gas usage will contribute to building energy emissions, due to the California Renewable Portfolio Standards.

Climate Action Targets

Based on the City's historic GHG inventories, climate action targets were developed to align with the State's 2030 goal to reduce GHG emissions 40 percent below 1990 levels by 2030 (SB 32), and to zero in 2045 (EO B-55-18). Figure 6-6 illustrates these targets relative to the BAU and adjusted forecast scenarios and 2015 GHG emissions baseline. The target reduction pathway shown in the figure below is representative of a per capita target reduction so that Rohnert Park can still meet its targets if unexpected changes in population or housing occur in the future.

Figure 6-6 GHG Emissions Forecasts and Climate Action Targets for Rohnert Park



Rohnert Park will work towards the identified target reduction pathway through implementation of this Climate Change Element and the associated actions contained in this General Plan Update, including working through the established partnerships with Sonoma Clean Power, RCPA, other Sonoma County jurisdictions, the Federated Indians of Graton Rancheria and other governmental entities to reduce emissions countywide. These efforts include a Climate Mobilization Strategy, implemented by Sonoma County, to support a resolution declaring a Climate Emergency that was adopted by RCPA in September of 2019.

6.3 GHG Reduction Plan for Rohnert Park

Based on its GHG inventory, the most efficient methods of reducing emissions in Rohnert Park are those focusing on emissions reductions for on-road vehicles and buildings, which together account for over 90 percent of the GHG emissions in the city. Electrification of vehicles (i.e., putting electricity-powered cars on the road in place of fossil fuel-powered vehicles) and buildings (i.e., installation of all-electric equipment in place of natural gas-powered equipment) is a demonstrated pathway for reducing these emissions. Using electricity rather than fossil fuels to power buildings and vehicles will reduce emissions in Rohnert Park because of the City's participation in Sonoma Clean Power, which procures renewable electricity for Rohnert Park, and the State's Renewable Portfolio Standard requires all electricity providers, including Sonoma Clean Power, to procure 100 percent carbon-free electricity by 2045 or earlier. Together, the State's requirements and Sonoma Clean Power's commitments ensure that anything powered by electricity in 2045 will be operationally carbon-free. Combined with energy efficiency improvements, electrification can reduce building and transportation emissions to near zero well before 2045.

The City's Current and Future Power Supplies

The two primary sources of power for residences and business in the city are electricity and natural gas. The most common uses of electricity are for lighting and heating or cooling buildings; for powering appliances such as refrigerators, computers, and washing machines; and for conveying water around the county and into homes or to treatment plants. Natural gas is most typically used for heating buildings and water, in addition to powering industrial and manufacturing processes.

The majority of the energy used in the homes and businesses of Rohnert Park is currently provided primarily by Sonoma Clean Power (SCP). The City joined the Sonoma Clean Power program in 2014 to transition away from non-renewable sources of energy for buildings and all residences and businesses have the option of purchasing their power from SCP. As shown in Figure 6-7 below, most of the energy supplied through SCP is carbon free, with the largest portion coming from large hydroelectric power stations, which is designated carbon-free but does not qualify as a renewable source. Wind energy and geothermal make up the next largest energy sources. Solar is the smallest source of renewable energy. The 3 percent that comes from CAISO System Power is from unspecified sources of energy generation through open market transactions that are not traceable to specific generation sources and may include a variety of renewable and non-renewable sources.

PG&E also provides electricity to some customers who have elected not to join SCP and provides the natural gas used in homes and buildings in Rohnert Park. Figure 6-8 illustrates the breakdown of PG&E's power sources. A majority of PG&E's energy is also sourced from a mix of renewables, large hydroelectric, and nuclear power. About 15 percent of PG&E's electricity comes from natural gas, which is the only fossil fuel source of energy in their power matrix.

Figure 6-7 Sonoma Clean Power Energy Source Breakdown

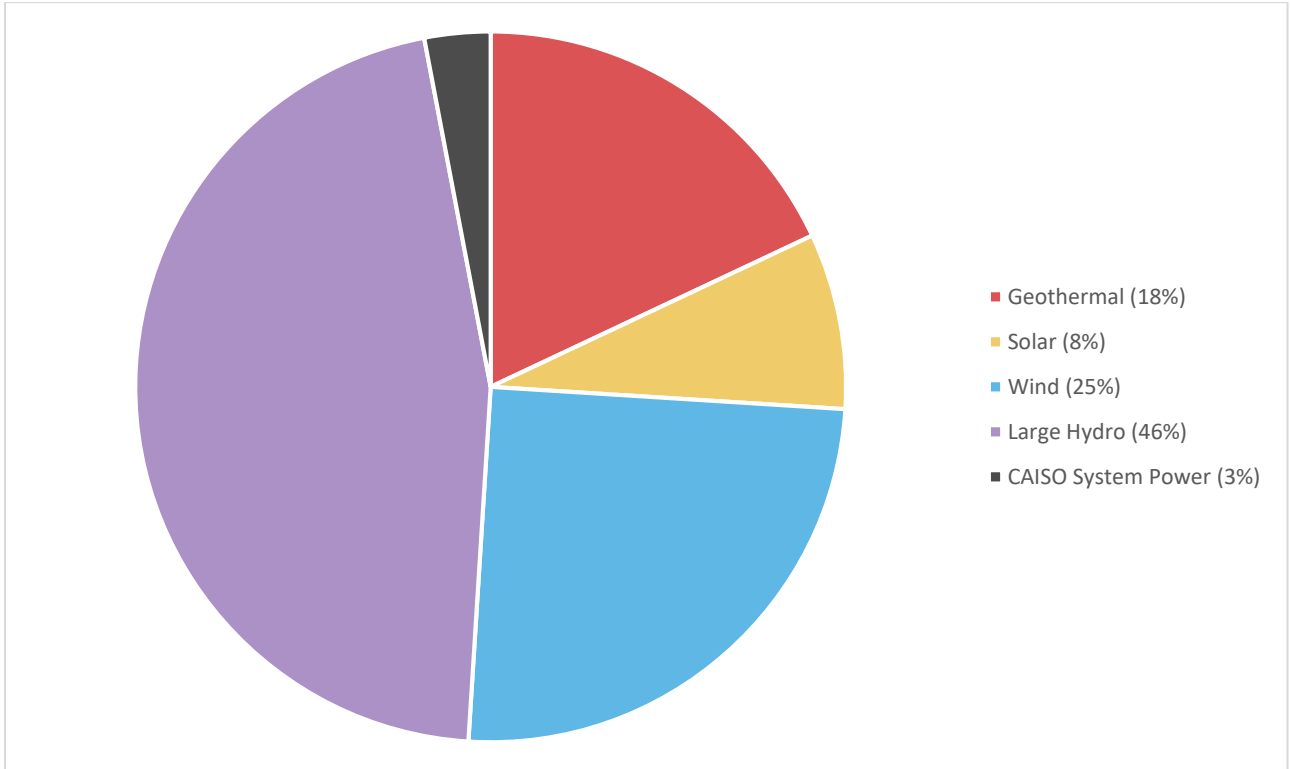
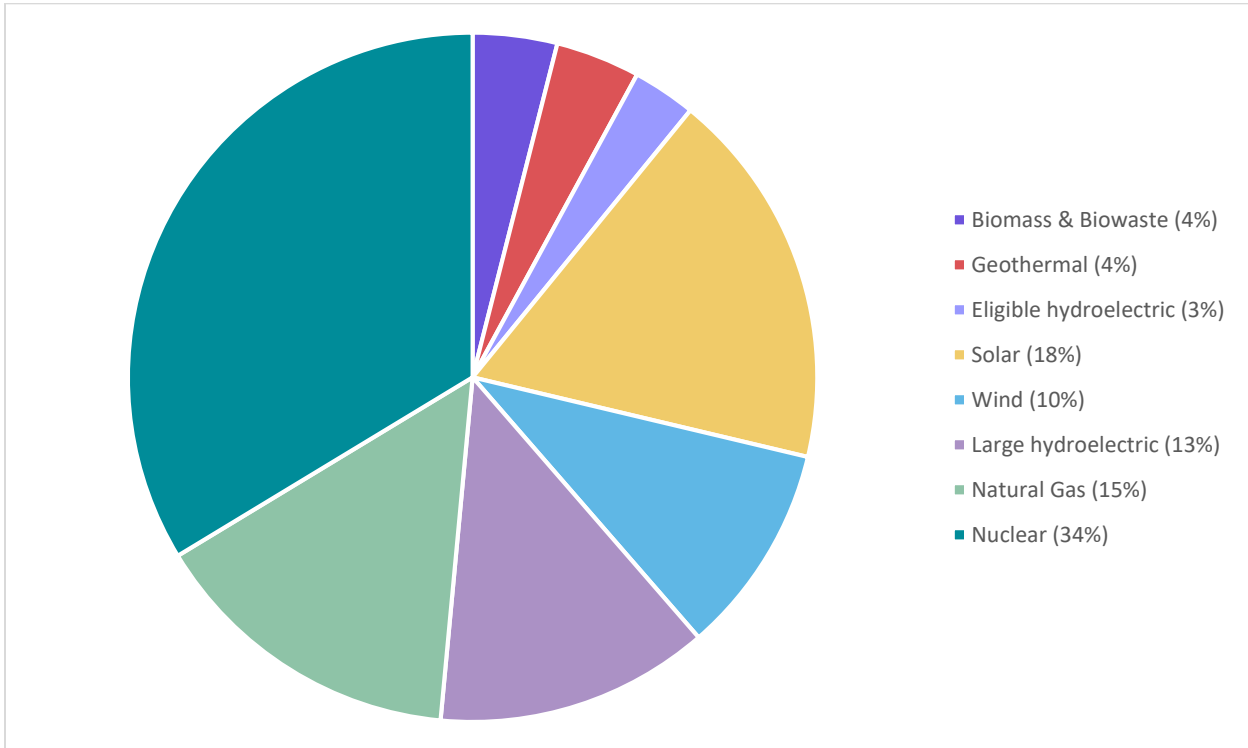


Figure 6-8 Figure CC-8: PG&E Energy Source Breakdown



Goals and Policies for GHG Reduction

The City of Rohnert Park has begun a path towards electrification and decarbonization by joining Sonoma Clean Power. Gaining a nearly carbon-free power mix through SCP makes the transition to a fully carbon-free economy feasible through a shift to electric vehicles and buses, adopting electric appliances, and shifting buildings away from natural gas usage. The goals and policies listed below are intended to move the city further along the path to decarbonization, allowing it to meet the 2045 carbon neutrality goal set by the State.

CC-1 *Provide leadership in climate change mitigation and adaptation and organize community action.*

CC-1.1 Lead by Example

The City shall lead by example by establishing an internal working group comprised of city departments that also works with regional partners to implement climate-related policies to achieve the City's GHG reduction and climate resiliency goals.

CC-1.2 Create a Climate Coalition

The City shall support a community led roundtable dedicated to responding to climate change and building support for mitigation and adaptation strategies. The support will include seed funding to support community organizing efforts.

CC-1.3 Public Outreach

Conduct regular public outreach to facilitate a dialogue with the community about electrification programs available to them and gather input from the community about programs they would like to see.

CC-1.4 Sustainable Business Practices

The City shall encourage green business certification in order to minimize waste generation, create recycling programs that reduce waste, improve energy efficiency and conservation practices

CC-1.5 Evolve with Technological Changes

The City shall evolve with technological changes and adapt City policies and development standards as necessary to reflect changes in the way the community works and lives, including sustainability and mobility.

CC-1.6 Partner with Federated Indians of Graton Rancheria (Tribe) on Initiatives

The City shall seek partnership opportunities with the Tribe on climate change response initiatives.

CC-2 *Ensure clean, emissionsfree energy for new developmentsand building retrofits*

CC-2.1 Culturally Proficient Services

Adopt a new building ordinance which bans the installation of natural gas in new residential construction.

CC-2.2 Retrofit Requirements

Monitor emerging technologies so that retrofit requirements can be tailored to affordable alternate solutions.

CC-2.3 Streamline Battery Storage Requirements

Work with various City departments to establish and streamline battery storage requirements to allow for easier implementation of these technologies throughout the city.

CC-2.4 Renewables Battery Storage

Encourage the development of micro-grid/small scale battery storage facilities in Rohnert Park for storing renewable energy for nighttime energy use.

CC-2.5 Electric Appliances

Identify funding and other financial incentives to promote the adoption of electric appliances for rentals, homeowners, and small businesses.

CC-2.6 GHG Reduction Priorities for New Development

The City shall prioritize new development that reduces GHG emissions by lowering vehicle miles traveled (VMT); discourages auto dependence; is compact, mixed-use, pedestrian friendly, and transit oriented; promotes energy-efficient building design and site planning; and improves the jobs/housing balance ratio.

CC-3 *Continue municipal efforts to reduce GHG emissions*

CC-3.1 Sustainable Environmental Practices

The City shall include and implement sustainable environmental practices within City-owned buildings and operation of public facilities.

CC-3.2 Reduced-Emission Equipment Preference

The City shall require contractors to use electric-powered equipment where available and feasible for City construction projects and contracts for services.

CC-4 *Promote the production of renewable energy.*

CC-4.1 Sonoma Clean Power (SCP)

Coordinate with SCP to procure carbon-neutral energy for long-term and short-term supplies, in particular renewable resources.

CC-4.2 Renewable Energy

The City shall promote efforts to increase the use of renewable energy resources such as wind, solar, hydropower, and biomass both in the community and in City operations.

CC-4.3 Solar Electric Systems

Support the maximum economic use of solar electric (photovoltaic) systems on-site with battery storage capabilities to augment the renewable energy portfolio available to new development, businesses, and municipal facilities.

CC-4.4 Design for a Transition in Energy Sources

The City shall encourage developers of all new development to partner with Sonoma Clean Power and include solar power infrastructure, with a focus on energy storage, vehicle charging stations, and distributed renewable energy production.

CC-5 *Implement and promote energy efficiency programs.*

CC-5.1 Energy-Efficient Buildings and Infrastructure

The City shall continue to improve energy efficiency of City buildings and infrastructure through efficiency improvements, equipment upgrades, and installation of clean, renewable energy systems to achieve climate action goals and reduce operating costs.

CC-5.2 Energy-Efficient by Design

The City shall promote site and building design that improves energy efficiency through natural cooling and passive solar heating design, including extended eaves, window overhangs, and awnings; tree placement for natural cooling; and orientation of buildings and windows to take advantage of passive solar heating.

CC-5.3 High Efficiency Outdoor Lighting

The City shall adopt high-efficiency outdoor lighting (e.g., LED light bulbs) in new facilities and replace existing less efficient outdoor lighting when opportunities arise.

CC-6 *Increase Electric Vehicle (EV) Adoption and Infrastructure*

CC-6.1 Develop an EV Readiness Plan

Develop an EV Readiness Plan that is consistent with Sonoma County EV planning. This plan should establish a path forward to increase EV infrastructure within the city, promote equitable mode shift to EVs, and identify funding for implementation of public charging infrastructure in key locations.

CC-6.2 Preference to Hybrid and Electric Vehicles

The City shall encourage commercial areas and new multifamily developments to provide dedicated parking for hybrid and electric vehicles.

CC-6.3 Electric Vehicle Incentive

Create incentives for electric vehicle adoption by providing EV parking only spots in high-traffic convenience locations and public parking EV chargers. Develop a parking space ratio for new developments to have a specified amount of EV only parking with chargers.

CC-6.4 Increase Public EV Infrastructure

Require installation of electric vehicle charging stations as a ratio of total required parking for new and redeveloped commercial, multifamily, residential subdivision, and condominium projects.

CC-6.5 Non-Residential Electric Vehicle Charging Stations

The City shall require new non-residential development projects to include the installation of electric vehicle charging stations consistent with the State of California Green Building Code (CALGreen). The charging stations should be sited to provide prioritized access to building entrances.

CC-6.6 Residential Electric Vehicle Charging Stations

The City shall require new residential development projects to be "electric vehicle charging ready," including the installation of higher-voltage electric systems to serve for the Level 2 charging of electric vehicles consistent with the California Green Building Code.

CC-6.7 Alternative Fuel for City Vehicle Fleet

The City shall transition the City municipal vehicle fleet to alternative-fuel vehicles provided that the alternative fuel vehicle can meet the performance standards required for its use.

6.4 Climate Adaptation

The climate is changing more rapidly each year as human activities continue to discharge emissions into the atmosphere, warming the planet and causing shifts in climate patterns. We adapt to climate change by observing and preparing for the worsening of natural events such as precipitation and flooding, average temperature, wildfire acreage burned, drought frequency and severity, and extreme heat events. In a world where no climate adaptation measures are taken and our GHG emissions continue at the same historic rate, we would see dramatic changes to the world's climate. The City of Rohnert Park has its own set of vulnerabilities to this changing climate, making local adaptation measures necessary.

This section illustrates the climate change narrative of several natural hazards that are impacting the city now and how they are forecasted to change in the future under various emissions scenarios. As analyzed in the California 4th Climate Change Assessment, California as a whole could see an increase in average annual maximum daily temperatures of 5.6 to 8.8 degrees if no changes to GHG emissions were made. The Sierra Nevada snowpack could decline by 19 percent by 2025-2050 and amplify to an 83 percent decline by 2075-2100 in a state where water supply is highly dependent on snowpack. More intense heat waves with a projection of two to three times more heat-related deaths by mid-century, with a disproportionate impact on vulnerable populations with less resources to adapt to climate extremes, could cause a serious public health threat.

Climate Hazards, Increasing Temperatures

For the City of Rohnert Park, the temperature projections show an increase in the annual average temperatures for the year 2040 (Figure 6-9). The recorded average temperature from 1990 to 2005 was 71.6 degrees and the projected average temperature for 2006 to 2040 is 73.7 degrees. By 2040, there is projected to be an increase of 2.1 degrees for Rohnert Park, and these increasing temperatures also pose additional risks to the community in the form of extreme heat and deepening drought impacts.

Figure 6-9 Observed and Projected Annual Average Maximum Temperatures in the City of Rohnert Park

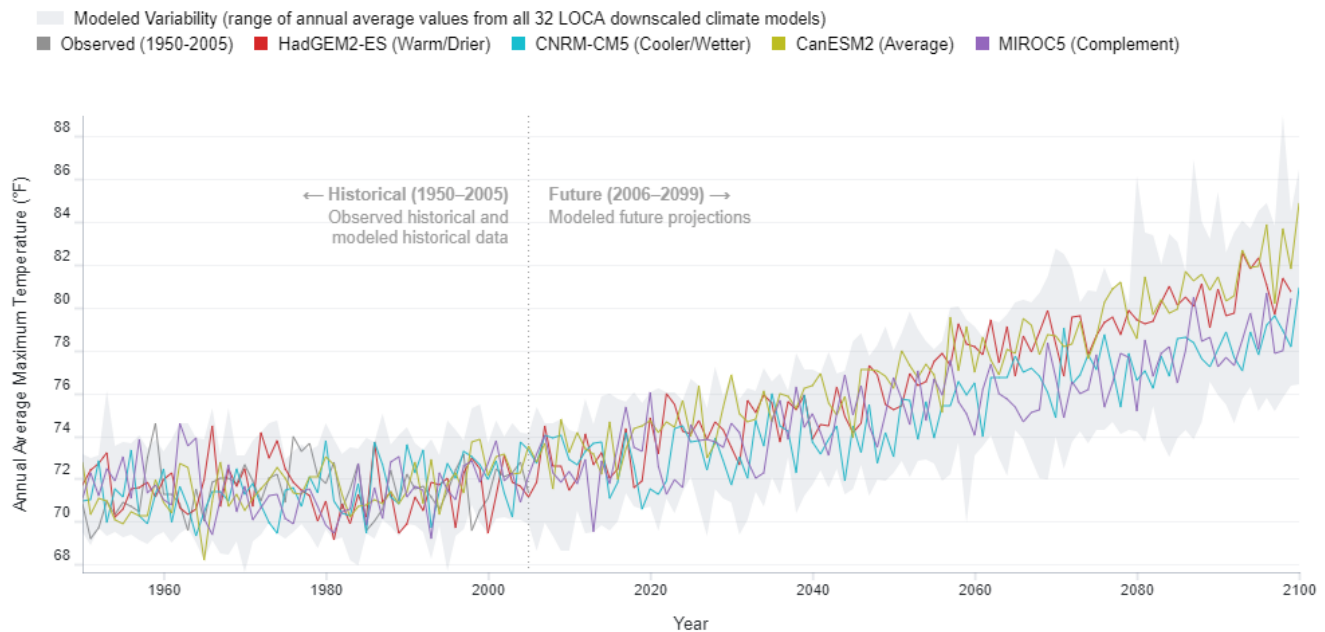


Figure 6-8 shows the historical and future projected annual average maximum temperatures in the City of Rohnert Park using the high emissions scenario (RCP 8.5). The four models shown are considered priority models for research in California and cover a wide range of possible futures. Source: Cal-Adapt.

Extreme Heat Days

The number of extreme heat days per year in Rohnert Park will increase. In Figure 6-9, the observed data from 1990 to 2005 show an average of 3 extreme heat days per year. The forecasted average from 2006 to 2040 is 8 extreme heat days per year. This presents a direct threat to public health, likely increasing the number of heat related illnesses like heat stroke and heat exhaustion. As the average temperatures and number of extreme heat days increase, the length and severity of droughts are projected to worsen, as discussed in the next section below.

Figure 6-10 Observed and Projected Extreme Heat Days by Year for the City of Rohnert Park

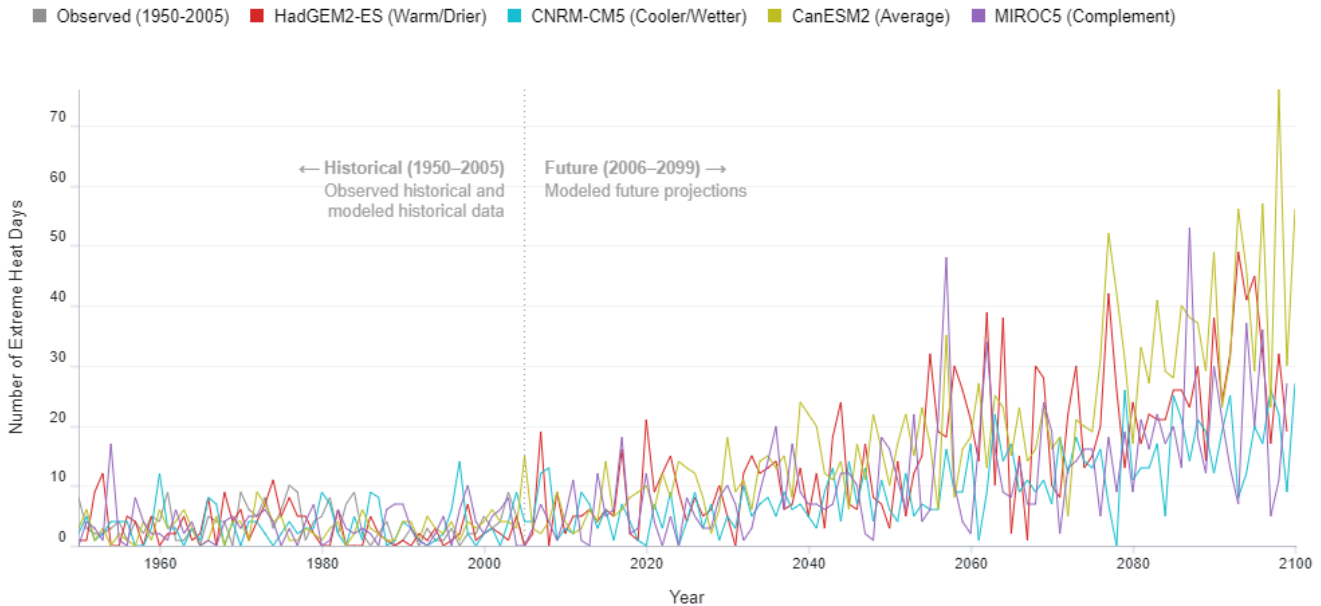


Figure 6-9 shows the historical and future projected extreme heat days by year in the City of Rohnert Park using the high emissions scenario (RCP 8.5). The four models shown are considered priority models for research in California and cover a wide range of possible futures. Source: Cal-Adapt.

Extreme Precipitation Events

Climate change is also expected to increase the severity and frequency of extreme precipitation events in the city. In Figure CC-10, the observed data from 1990 to 2005 show an average of two extreme precipitation events per “water year,” which occurs from October 1 of a year through September 30 of the following year. The projections for 2006 to 2040 average are predicted to be three extreme precipitation events per water year. However, in the future there will be more variability in extreme precipitation events, with some years having many extreme precipitation events and other years having much fewer, likely mirroring drought extremities.

Figure 6-11 Extreme Precipitation Events by Water Year for the City of Rohnert Park

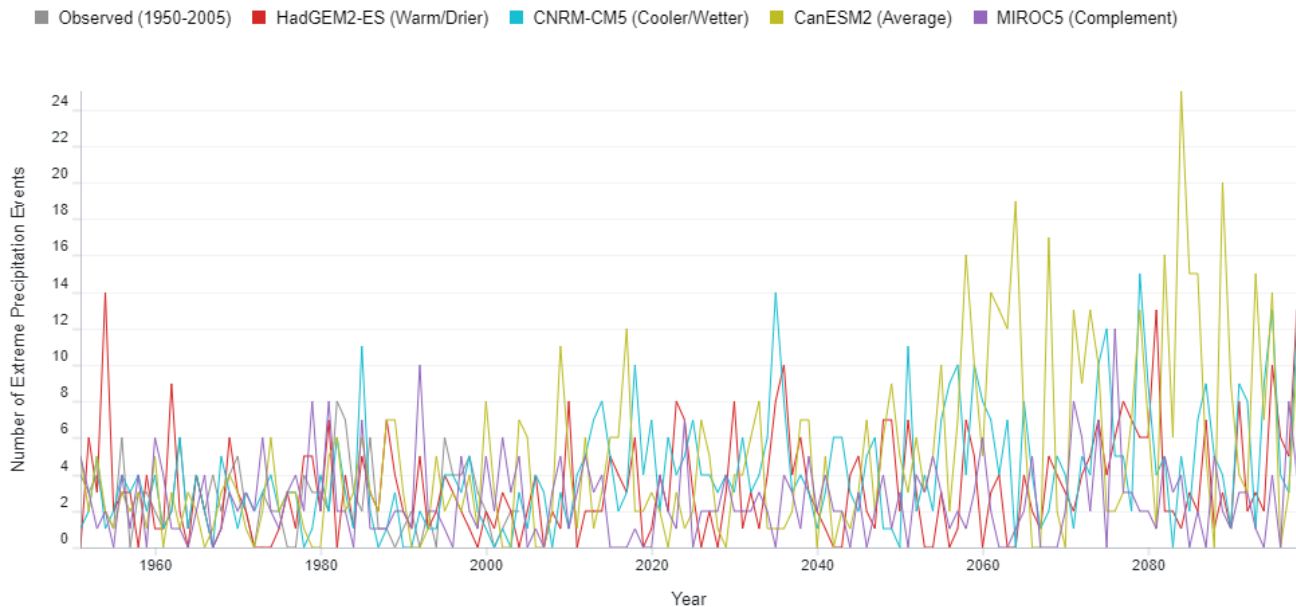


Figure 6-10 shows the historical and future projected extreme precipitation events by water year in the City of Rohnert Park using the high emissions scenario (RCP 8.5). The four models shown are considered priority models for research in California and cover a wide range of possible futures. Source: Cal-Adapt.

Droughts are often regional, and their impacts vary by location. If there is a statewide drought, the impacts would be felt everywhere in the state. Rohnert Park is projected to receive less overall rainfall in the 2023 to 2042 scenario. While extreme precipitation events are expected to become worse, the overall rainfall average is projected to be less than in the past. This means that precipitation will become more variable, with more intense downpours but less overall precipitation, which will worsen drought conditions.

Flooding Risk

As seen in Figure 6-12 below, the flood risk areas are primarily in the eastern, western, and southern portions of the city. This figure illustrates the flooding potential for areas of the city, where flooding may become more frequent due to more extreme precipitation events. Table 6-4 below lists critical facilities that are vulnerable to flood hazards enhanced by climate change, and several miles of roadways are also at risk to flooding. Mobile home parks in Rohnert Park are at an adverse risk to extreme precipitation events with Rancho Verde, Rancho Grande, Rancho Feliz, and Valley Village as medium- to very high-risk for flooding events. Vulnerability to floods disproportionately poses a risk to the mobile home communities of Rohnert Park.

6. Climate Change Element

Figure 6-12 City of Rohnert Park Flood Map

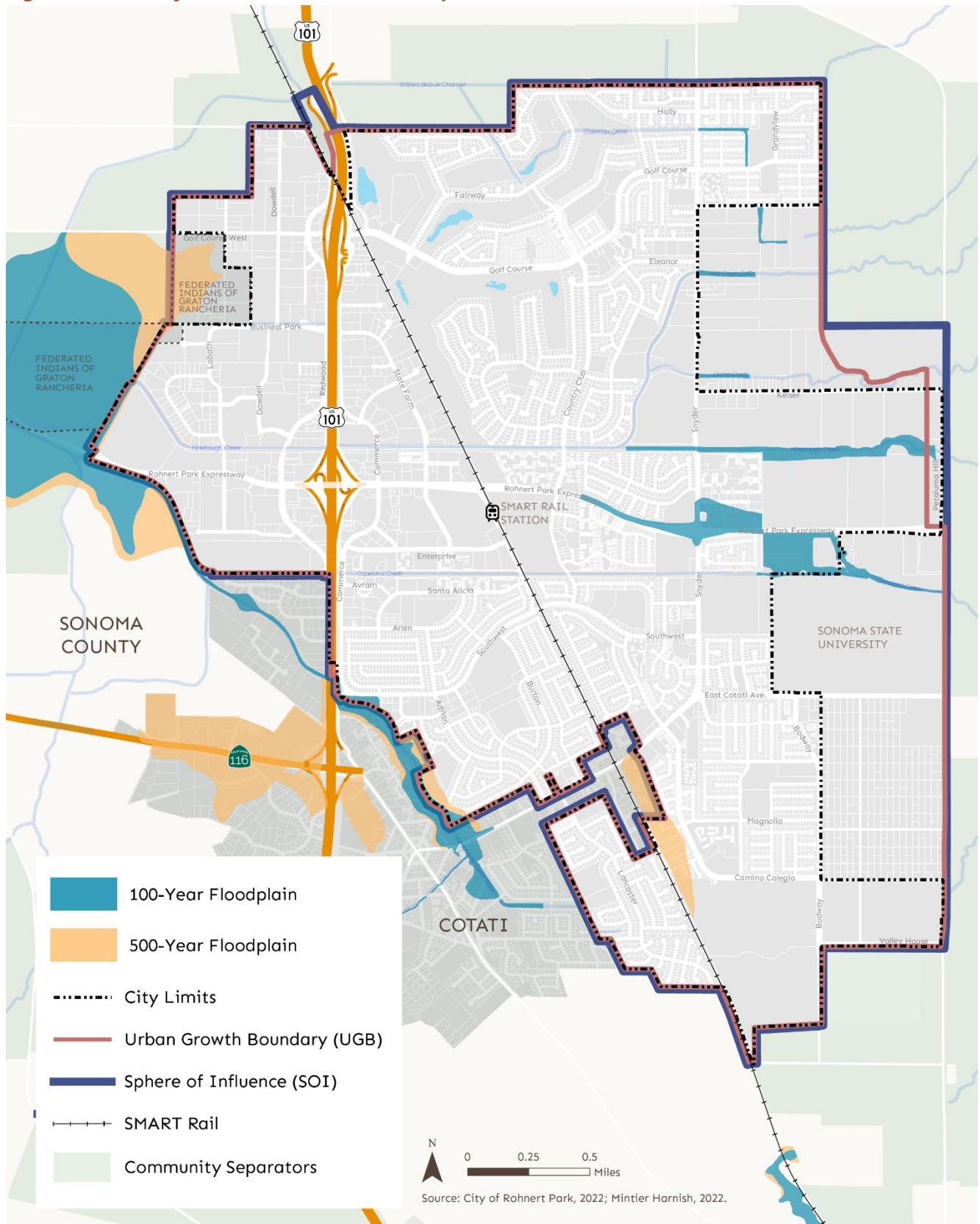
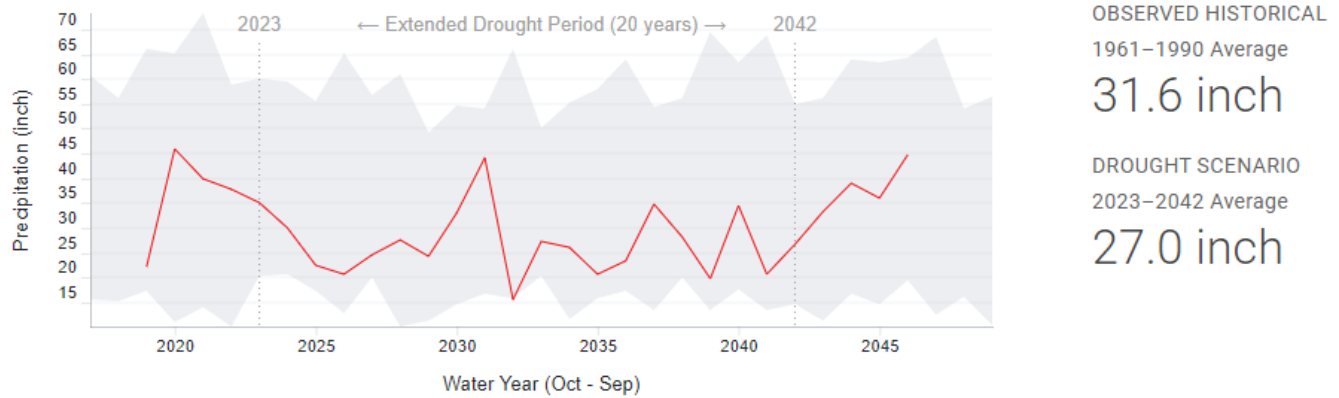


Figure 6-13 shows the projected extended drought period from 2023 to 2042 in the City of Rohnert Park.

Figure 6-13 Projected Extended Drought Period in the City of Rohnert Park (2023-2042)

Accumulated rainfall and snowfall.



Source: Cal-Adapt.

Increasing Wildfire Risks and Impacts

The impacts of wildfires in Rohnert Park and the broader region is becoming an annual hazard. This includes not only fire directly threatening the city itself, but also the impacts from a nearby wildfire or unhealthy periods of air pollution from smoke originating from a wildfire outside the city or region. Many Rohnert Park residents have experienced days of smoke pollution that have blocked out the sun and hindered breathing, especially for those with health concerns. According to Rohnert Park’s Local Hazard Mitigation Plan (LHMP), fires have historically burned within the wildland urban interface (WUI) east of the city outside Sonoma State University and south toward Petaluma. In October 2017, the Sonoma Complex Fires burned north, east, and south of the city for nearly three weeks, with the Tubbs and Nuns Fires burning closest to Rohnert Park and destroying a combined 6,991 structures and 93,363 acres of land. Wildfire risk is apparent and as the city expands more into the wildland-urban interface (WUI) the risk of wildfires will increase. As the average temperatures of the city are expected to rise as a result of climate change, the additional heat will dry vegetation and lower the water content of the soil. This will increase the risk of wildfires starting and increase their fuel burning potential.

These recent fires and the growing risk across the state have highlighted the significant wildfire risks that exist within the wildland urban interface on both the east and west sides of Rohnert Park. These risks are amplified by the on-going challenges with Tan Oaks falling victim to Sudden Oak Death Syndrome, which provide dry wood as fuel for wildfires when the Tan Oaks succumb to the disease. As climate change increases the average annual temperature, length and frequency of droughts, and the variability in climate patterns between wet and dry conditions, changes to the fire risks will occur in two different ways: by altering vegetation growth rates (e.g., fuel accumulation), or through changes in fire season length and severity.

The Cal Adapt climate tool for modeling wildfire area burned in Rohnert Park shows the city may experience on average 3.9 acres of burned land area over the course of each year out to the end of the century. This will vary year-by-year, but the greatest ongoing impact from wildfires for Rohnert Park is the public health risks involved with smoke pollution from regional or statewide fires during the wildfire season. Smoke pollution will have adverse impacts on children, older adults, and those with chronic health issues such as asthma and

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heart and lung disease. Even though Rohnert Park may not be at as great a risk for a wildfire to burn in the city as its neighbors to the north, the impacts of nearby or regional fires with poor air quality poses a substantial risk to public health.

Vulnerabilities for Rohnert Park

According to the City of Rohnert Park Local Hazard Mitigation Plan there are numerous critical facilities that are vulnerable to climate hazard risk. These include medical facilities, schools, mobile home parks, pump facilities, water tanks, community facilities, and senior centers. The most frequent and highest vulnerability identified in the LHMP is fire and flood risk, as seen in Table 6-4 below. Areas and facilities prone to flooding are predicted to experience greater risk from this hazard as climate change impacts intensify, as seen in the Cal-Adapt charts above. Extreme precipitation events increasing in frequency and intensity will translate into more frequent and hazardous flooding scenarios for these critical facilities and neighborhoods.

Table 6-4 List of Facilities at Risk to Flood and Wildfire Hazards

Facility	Address	Facility Type	Flood	WUI-Fire
City Hall	130 Avram Avenue	Government Center	High	
Senior Center	6800 Hunter Drive	Community	Medium	
Community Center	5401 Snyder Lane	Community	Medium	
Spreckels Performing Arts Center	5409 Snyder Lane	Community	Medium	
Pump Facility	201 J Rogers Lane	Public Works	Medium	
Enterprise Avenue Landscaping	Enterprise Avenue	Public Works	Medium	
Water Tanks	Various Locations	Public Works		Medium
Sutter Pacific	1400 Medical Center Drive	Medical	Medium	
Urgent Care Center	1450 Medical Center Drive	Medical	Medium	
Lawrence E. Jones Middle School	5154 Snyder Lane	School	Medium	Medium
Sonoma State University	1801 East Cotati Avenue	University		Medium
Credo High School	1300 Valley House Drive	School		Medium
Rancho Verde	650 Rohnert Park Expressway	Mobile Home Park	Very High	
Rancho Grande	5099 Snyder Lane	Mobile Home Park	Medium	Medium
Rancho Feliz	6607 Redwood Drive	Mobile Home Park	Medium	Medium
Valley Village	6401 Country Club Drive	Mobile Home Park	High	

Source: City of Rohnert Park Local Hazard Mitigation Plan (LHMP).

Resilient Development

Adapting to changes in the climate can be achieved through transforming the way buildings and communities are designed. Resilient communities are ones that can respond and adapt to changes and protect against vulnerabilities such as extreme heat, precipitation events, drought, and wildfires. Rohnert Park has a number of vulnerabilities that need to be addressed as climate change increases risks. Resilient development is the intentional design of buildings and infrastructure to respond to and address those vulnerabilities.

Local government has a fundamental role to play in creating a more resilient community. Local municipalities can implement an urban forest master plan to adapt to extreme heat days, require all new buildings to be all-electric to improve safety during fires, and focus on water conservation efforts. Critical facilities in the public sector such as emergency response operations can have on-site renewable energy and storage to be resilient to power outages during extreme weather events. Resilient development can also come in the form of natural solutions, planting street trees to mitigate the urban heat island effect and implementing new buildings standards to incentivize passive heating and cooling strategies. This section lays out strategies that the city can take to increase the resiliency of the Rohnert Park and mitigate the impacts of future hazards related to a changing climate.

Climate Adaptation

CC-7 *Identify and prepare the City for climate change impacts.*

CC-7.1 **Climate-Resilient Public Facilities**

The City shall promote sustainable and resilient planning, design, construction, renovation, and maintenance of public facilities.

CC-7.2 **Sustainable Building Materials**

The City shall support the use of sustainable building materials, including recycled-content materials that are consistent with the style and character of buildings, and integrate more advanced optional provisions of the CALGreen building energy code into Rohnert Park development standards.

CC-7.3 **Preserve and Enhance Open Space, Natural Features, and the Urban Forest**

Ensure that the existing open spaces, parks and creeks are preserved and maintained to reinforce the relationship between Rohnert Park and its natural setting.

CC-7.4 **Landscaping Vegetation**

The City shall require new development, parks, public areas, and open space to use landscaping vegetation that is drought-tolerant and fire-resistant, unless alternative vegetation is approved by the City. Native plant species should be used in public areas and in open space corridors along creeks to the extent feasible.

CC-7.5 **Flooding Adaptation Plan**

Adopt a Flooding Adaptation Plan that prepares for climate exacerbated impacts to flooding events from heavy precipitation.

CC-8 *Enhance the adaptive capacity of manmade and natural systems to mitigate climate change risks.*

CC-8.1 **Critical Facilities**

Ensure future critical facilities are not located in areas at risk of being impacted by climate change related hazards.

CC-8.2 **Restoration Partnerships**

The City shall work with private, non-profit, and public groups to secure funding for potential restoration projects in the region.

CC-9 *Promote a high standard of air quality in order to protect public health, safety, and welfare, and mitigate any adverse air quality impacts.*

CC-9.1 Clean Air Plan Implementation

The City shall cooperate with BAAQMD to implement the Clean Air Plan, enforce air quality standards, and achieve emissions reductions for nonattainment pollutants, including ozone, PM₁₀, and PM_{2.5} by implementation of air pollution control measures as required by State and Federal statutes.

CC-9.2 Vehicle Idling

The City shall limit idling of all commercial vehicles to three minutes within a period not to exceed 30 minutes, except as necessary for the loading or unloading of cargo.

CC-9.3 Minimum Exposure

The City shall require construction and operation of new development to mitigate any potential significant air quality impacts to ensure that proximate sensitive receptors (i.e., residences, schools, senior facilities) are not exposed to significant levels of criteria air pollutants or toxic air contaminants.

CC-9.4 Health Risk Assessments for Sensitive Receptors

The City shall require new development within 500 feet of freeways and roadways with over 100,000 vehicle trips per day that include residential uses or other sensitive receptors prepare a health risk assessment (HRA) to identify potential health risk impacts. Based on the results of the HRA, the City shall require mitigation measures, as necessary, to reduce potential exposure to toxic air contaminants.

6.5 Implementation Programs

Programs	Implements Which Policy(ies)	Responsible	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
		Supporting Department(s)					
A Facilitate Adoption of EV Technologies The City shall coordinate with the Regional Climate Protection Authority to develop a framework for the consistent adoption of electric vehicle technologies in the City. The framework will outline strategies for new residential uses, new non-residential uses, and the retrofit of existing uses.	CC-1.1 Lead by Example	Public Works	■				
	CC-1.2 Create a Climate Coalition						
	CC-1.3 Public Outreach						
	CC-1.5 Evolve with Technological Changes						
	CC-3.1 Sustainable Environmental Practices						
	CC-3.2 Reduced-Emission Equipment Preference						
	CC-6.2 Preference to Hybrid and Electric Vehicles						
	CC-6.3 Electric Vehicle Incentive						
B Establish a Green Team Establish a “Green Team” consisting of staff from city departments, community, and regional partners to implement policy goals and measures related to climate action.	CC-1.1 Lead by Example	City Manager					■
	CC-1.2 Create a Climate Coalition						
	CC-8.2 Restoration Partnerships						

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Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
C Climate Action Partnerships Explore climate restoration partnerships and investment strategies to remove GHG emissions from the atmosphere.	CC-1.2 Create a Climate Coalition CC-1.3 Public Outreach CC-8.2 Restoration Partnerships	Public Works	■				
D Shared Mobility Improvements Improve shared mobility, transit programs, and infrastructure to reduce passenger VMT by 2 percent by 2030, and 4 percent by 2045.	CC-1.2 Create a Climate Coalition CC-2.6 GHG Reduction Priorities for New Development CC-6.1 Develop an EV Readiness Plan	Public Works			■		
E Improvements to Edible Food Recovery Establish and implement edible food recovery programs by 2023 to improve efficiency of edible food generators, food recovery services, and food recovery organizations comply with requirements to increase recovery rates.	CC-1.3 Public Outreach CC-3.1 Sustainable Environmental Practices	Public Works	■				
F Organics Collection Ordinance Implement an ordinance by 2022 requiring residential and commercial organic generators to subscribe to organics collection programs or alternatively report organics self-hauling and/or backhauling.	CC-1.3 Public Outreach CC-3.1 Sustainable Environmental Practices	Public Works	■				
G Salvage Local Plant Materials Update City's landscape ordinance to require developers salvage local plant materials, to the greatest extent possible, for integration into project landscaping as a way to provide or enhance wildlife habitat.	CC-1.3 Public Outreach CC-3.1 Sustainable Environmental Practices	Planning Division		■			

Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
<p>H Organic Waste Disposal Program Update waste hauler contracts to implement the requirements of SB 1383 and achieve 75 percent reduction in organic waste disposal by 2025 by including composting in multi-family housing and commercial centers.</p>	<p>CC-1.3 Public Outreach</p> <p>CC-3.1 Sustainable Environmental Practices</p>	Public Works	■				
<p>I Urban Forest Expansion for Carbon Sequestration Maximize local carbon sequestration by increasing urban canopy cover by at least 12 percent by 2035.</p>	<p>CC-1.4 Sustainable Business Practices</p> <p>CC-7.2 Sustainable Building Materials</p> <p>CC-7.3 Preserve and Enhance Open Space, Natural Features, and the Urban Forest</p> <p>CC-7.4 Landscaping Vegetation</p> <p>CC-8.2 Restoration Partnerships</p> <p>CC-9.1 Clean Air Plan Implementation</p> <p>CC-9.3 Minimum Exposure</p>	Public Works			■		

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Programs	Implements Which Policy(ies)	Responsible	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
		Supporting Department(s)					
J Electric Appliances Building Retrofit Program Coordinate with SCP and other local programs to create incentives for retrofitting for electric appliances in existing buildings by 2025.	CC-2.1 All-Electric Buildings Ordinance CC-2.2 Retrofit Requirements CC-2.5 Electric Appliances CC-5.1 Energy-Efficient Buildings and Infrastructure	Public Works	■				
K Building Electrification Ordinance Adopt a new building ordinance which bans the installation of natural gas in new residential construction by 2023 and in new commercial construction by 2024. The ordinance will only apply for building types where electrification is shown to be cost effective.	CC-2.1 All-Electric Buildings Ordinance CC-5.1 Energy-Efficient Buildings and Infrastructure CC-5.2 Energy-Efficient by Design	Development Services	■				
L On-site Renewable Energy and Battery Storage for Critical Public Facilities Require on-site renewable energy and battery storage for critical public facilities and large residential and commercial buildings.	CC-2.1 All-Electric Buildings Ordinance CC-2.3 Streamline Battery Storage Requirements CC-2.4 Renewables Battery Storage CC-5.1 Energy-Efficient Buildings and Infrastructure CC-5.2 Energy-Efficient by Design	Public Works Development Services	■				

Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
<p>M Streamline Review of Micro-Grid Energy Storage Review approval process for micro-grid energy storage facilities and other on-site battery storage options to ensure a streamlined approval process for preferred methods of battery storage in Rohnert Park.</p>	<p>CC-2.3 Streamline Battery Storage Requirements</p> <p>CC-2.4 Renewables Battery Storage</p>	<p>Development Services</p>	<p>■</p>				
<p>N Funding Opportunities for Residential Battery Storage Identify rebates and funding opportunities for residential battery storage capabilities and notify residents and businesses of opportunities through existing communication channels.</p>	<p>CC-2.3 Streamline Battery Storage Requirements</p> <p>CC-2.4 Renewables Battery Storage</p>	<p>Public Works</p>	<p>■</p>				
<p>O Local Clean Energy Battery Storage Partner with SCP to increase generation and storage of local renewable energy by taking advantage of Federal and State grant programs.</p>	<p>CC-2.4 Renewables Battery Storage</p> <p>CC-5.1 Energy-Efficient Buildings and Infrastructure</p>	<p>Public Works</p>			<p>■</p>		
<p>P Bi-annual Review of Development Standards Every two years, review and, if necessary, update the development standards in the City's zoning ordinance to ensure they reflect current best practices for resilient development.</p>	<p>CC-2.6 GHG Reduction Priorities for New Development</p> <p>CC-3.1 Sustainable Environmental Practices</p>	<p>Development Services</p>					<p>■</p>

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Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
Q GHG Emissions Inventory Update Program Update the citywide GHG emissions inventory every five years.	CC-2.6 GHG Reduction Priorities for New Development CC-3.1 Sustainable Environmental Practices	Public Works	■	■	■		
R Clean Energy Transition Decarbonize electricity prior to 2025 to reduce electricity emissions 100 percent by 2030 through negotiations with the SCP coalition.	CC-4.1 Sonoma Clean Power (SCP) CC-4.2 Renewable Energy CC-4.3 Solar Electric Systems CC-4.4 Design for a Transition in Energy Sources CC-5.1 Energy-Efficient Buildings and Infrastructure CC-5.3 High Efficiency Outdoor Lighting	Public Works Development Services		■			
S Small-scale Wind Energy Feasibility Study Conduct a feasibility study for small-scale wind energy production in Rohnert Park by 2023.	CC-4.2 Renewable Energy CC-5.1 Energy-Efficient Buildings and Infrastructure	Public Works	■				

Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
<p>T Resilient Public Critical Facilities Upgrade public critical facilities such as libraries and community centers to incorporate resiliency and preparedness to extreme heat events and poor air quality, prioritizing the protection of public health for vulnerable populations.</p>	<p>CC-4.2 Renewable Energy</p> <p>CC-4.3 Solar Electric Systems</p> <p>CC-5.2 Energy-Efficient by Design</p> <p>CC-5.3 High Efficiency Outdoor Lighting</p> <p>CC-7.1 Climate-Resilient Public Facilities</p> <p>CC-7.2 Sustainable Building Materials</p> <p>CC-7.5 Flooding Adaptation Plan</p> <p>CC-8.1 Critical Facilities</p>	Public Works					■
<p>U EV Infrastructure Feasibility Study Conduct a community EV Feasibility Study to assess infrastructure needs and challenges, particularly in disadvantaged communities.</p>	<p>CC-6.1 Develop an EV Readiness Plan</p> <p>CC-6.2 Preference to Hybrid and Electric Vehicles</p> <p>CC-6.3 Electric Vehicle Incentive</p> <p>CC-6.4 Increase Public EV Infrastructure</p> <p>CC-6.5 Non-Residential Electric</p>	Public Works	■				

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Programs	Implements Which Policy(ies)	Responsible	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
		Supporting Department(s)					
	Vehicle Charging Stations CC-6.6 Residential Electric Vehicle Charging Stations						
V	Municipal Fleet Electrification Program As new municipal vehicles are purchased, the City shall phase out the use of gasoline vehicles in favor of the use of compressed natural gas and electric powered vehicles, as well as other alternative and/or renewable energy sources to the extent cost-effective and where the vehicle meets the requirements for its use.	CC-6.2 Preference to Hybrid and Electric Vehicles CC-6.3 Electric Vehicle Incentive CC-6.4 Increase Public EV Infrastructure CC-6.5 Non-Residential Electric Vehicle Charging Stations CC-6.7 Alternative Fuel for City Vehicle Fleet	Public Works				■
W	Utilize Public Lands for Climate Adaptation Utilize public lands and spaces to increase local carbon sequestration, reduce urban heat island effect, and improve air quality.	CC-7.3 Preserve and Enhance Open Space, Natural Features, and the Urban Forest	Public Works Development Services				■
X	BAAQMD's Non-Attainment Standards Comply with BAAQMD's non-attainment standards and implement required pollution control measures by State and Federal statutes.	CC-9.1 Clean Air Plan Implementation CC-9.2 Vehicle Idling CC-9.3 Minimum Exposure	Public Works Development Services				■

Programs	Implements Which Policy(ies)	Responsible Supporting Department(s)	2021 – 2025	2026 – 2030	2031 – 2040	Annual	Ongoing
	CC-9.4 Health Risk Assessments for Sensitive Receptors						