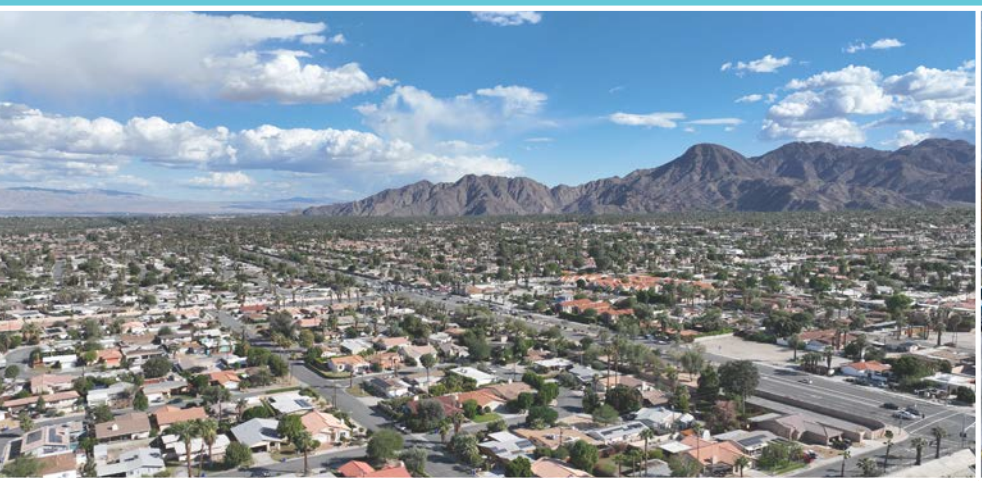
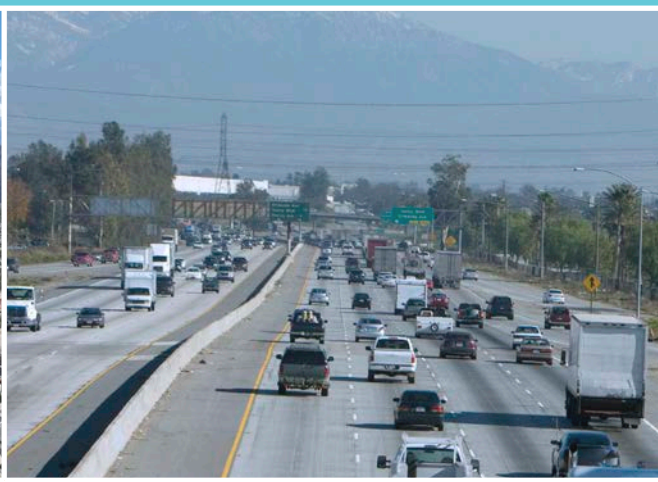
RIVERSIDE-SAN BERNARDINO-ONTARIO MSA

Priority Climate Action Plan (PCAP)

March 1, 2024





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PRIMARY COORDINATING ENTITIES

Southern California Association of Governments (SCAG)

Mojave Desert Air Quality Management District (MDAQMD)

South Coast Air Quality Management District (SCAQMD)

SUB-REGIONAL PLANNING ORGANIZATIONS

Coachella Valley Association of Governments (CVAG)

San Bernardino Council of Governments (SBCOG)

Western Riverside Council of Governments (WRCOG)

WITH ASSISTANCE FROM THE CONSULTANT TEAM

Environmental Science Associates (ESA)

ICF

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Executive Summary

This Priority Climate Action Plan (PCAP) serves as a high-level roadmap for reducing greenhouse gas (GHG) emissions throughout the Riverside−San Bernardino−Ontario metropolitan statistical area (MSA), which includes the Counties of Riverside and San Bernardino, California. Three councils of government represent the city and county governments in the MSA: Coachella Valley Association of Governments (CVAG), San Bernardino Council of Governments (SBCOG), and Western Riverside Council of Governments (WRCOG). The PCAP builds from a strong foundation of state, regional, and local policies as well as GHG inventories and existing climate action plans (CAPs) that have been developed by these sub-regional government agencies as well as local governments throughout the region. The lead organization for purposes of the Climate Pollution Reduction Grants (CPRG) Planning Grant Program is the San Bernardino County Transportation Authority (SBCTA)/San Bernardino Council of Governments (SBCOG).[1] Henceforth, will be referred to as SBCOG.

This PCAP provides a plan to reduce GHG emissions for the entire MSA based on a compilation of existing and new analysis that includes GHG inventories across all sectors (energy, transportation, solid waste, water & wastewater, and agriculture), assessment of reduction potential across each sector based on existing climate action plans, and the development of three regional measures deemed by stakeholders to be the highest priorities for implementation based on their near-term GHG reduction potential, need for funding, and anticipated co-benefits to low income and disadvantaged communities (LIDACs), to name a few key prioritization criteria. In addition, the PCAP assesses the cost of implementing the regional measures, the authority of the MSA's local jurisdictions and agencies to implement the measures, and the workforce implications of implementing each measure.

Existing GHG Inventories and Climate Action Plans

Many local jurisdictions in California have looked to provide consistency with the state's GHG targets (e.g., 2030, 2045, and 2050) by developing local GHG inventories and CAPs. The state's latest scoping plan (2022) for addressing climate change emphasized that when establishing GHG reduction targets, local governments should consider their respective share of the statewide reductions necessary to achieve the state's long-term climate target for each target year, and to best support those overall goals.[2] The California Air Resource Board (CARB) recommends that

1 SBCTA and SBCOG are a dual entity, with transportation being the focus of SBCTA. In 2016, the agency sponsored Senate Bill 1305 (Morrell), consolidating the County Transportation Commission, local transportation authority, service authority for freeway emergencies and local congestion management agency into a single entity, San Bernardino County Transportation Authority. The bill passed through both houses and was signed by the Governor in August 2016; it became effective January 1, 2017. (San Bernardino Associated Governments continues as a Joint Powers Authority functioning as a Council of Governments (SBCOG).

2 See California's 2022 Scoping Plan for Achieving Carbon Neutrality: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

jurisdictions focus on developing locally appropriate, plan-level targets that align with the California trajectory to carbon neutrality.

The foundation of existing CAPs in the region include the Western Riverside Subregional CAP originally completed by WRCOG in 2014 and updated in 2022, and the San Bernardino Regional Greenhouse Gas Reduction Plan originally completed by the SBCTA/SBCOG in 2014 and updated in 2021. In addition, more than 25 local CAPs have been completed in the region since 2010, including 7 in the WRCOG subregion, 8 in the SBCOG subregion, and 10 in the CVAG subregion. These efforts are described in more detail in *Chapter 2, Existing Climate Action in the Region.* The Subregional CAPs developed for the SBCOG and WRCOG subregions include emissions targets that align with the California goal of reducing emissions levels statewide to 40 percent below 1990 levels by 2030. Neither of these CAPs, however, provide emissions targets beyond 2030. Partnerships including the Inland Regional Energy Network (IREN)[3] provide programs and support for the energy sector in conjunction with these local climate actions.

Often operating in conjunction with climate action planning, GHG inventories serve to track GHG emissions within a defined geographic region and serve as the basis for establishing emissions forecasts and reduction targets. GHG inventories for the member jurisdictions of SBCOG and WRCOG were recently updated when the subregional CAPs were updated for those subregions, while a new subregional GHG emissions inventory was created for the CVAG subregion as part of this PCAP. These subregional GHG inventories are summarized below by sector in **Table ES-1** and **Figure ES-1**, along with an estimate of total emissions for the region.[4] The totals by sector indicate that on-road transportation contributes the largest share of regional emissions, at 50.8 percent, followed by building energy (consumption of natural gas and electricity) at 35.4 percent, solid waste disposed at landfills at 6.0 percent, mobile offroad equipment and agriculture each at 3.0 percent, water conveyance at 1.2 percent, and wastewater treatment at 0.6 percent. The inventory results indicate clearly that the biggest opportunities to achieve deep reductions in regional GHG emissions are within the on-road transportation and building energy sectors, which both play a critical role in the regional economy.

The GHG reduction measures found in the MSA's existing local and subregional CAPs, as well as the collective subregional GHG inventories, inform the efforts of this PCAP. The PCAP builds on the existing measures to establish a more cohesive, regional approach to reducing GHG emissions. The PCAP does not represent an exhaustive list of all possible local and regional measures for reducing emissions, but rather an early-stage framework that sets the stage for a more coordinated Comprehensive Climate Action Plan (CCAP) that will advance long term climate action and sustainability across the MSA.

3 https://www.iren.gov/27/About.

4 For comparison purposes, the inventory summaries in Table ES-1 include the sectors that were included for all three subregions. Although the subregional inventories were completed for different years, the three inventory years occur within a 2-year time span and thus can be considered comparable for regional planning purposes.

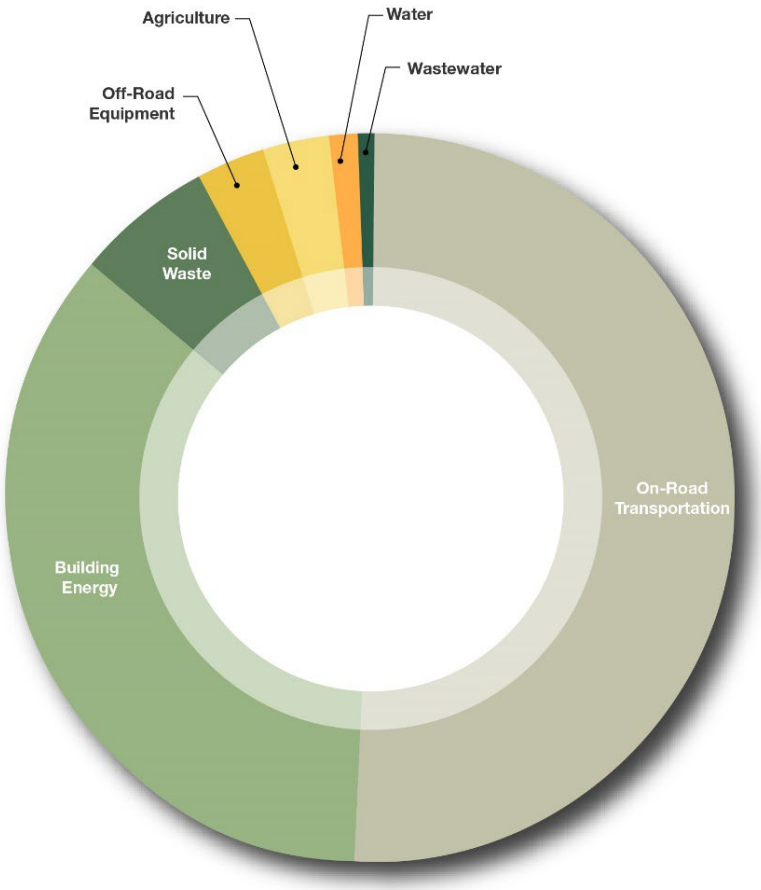
Table ES-1
GHG Emissions by Sector ($MTCO_2e$) for Entire Region (MSA)

Sector	CVAG (2018)	SBCOG (2016)	WRCOG (2017)	Region Total	Region % of Total[b]
On-Road Transportation	1,857,237	8,223,640	4,831,298	14,912,175	50.8%
Building Energy[a]	448,668	5,649,589	4,295,955	10,394,212	35.4%
Solid Waste	90,372	1,074,629	586,687	1,751,688	6.0%
Off-Road Equipment	105,470	247,911	532,816	886,197	3.0%
Agriculture	83,966	559,685	251,803	895,454	3.0%
Water	44,516	146,750	162,430	353,696	1.2%
Wastewater	24,031	70,039	79,485	173,555	0.6%
Total	**2,654,260**	**15,972,243**	**10,740,474**	**29,366,977**	**100.0%**

NOTES:

a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. Totals may not add up due to rounding.

Figure ES-1 GHG Emissions by Sector (MTCO2e) for Entire Region (MSA)



PCAP Regional Measures

Although the PCAP includes a wide range of measures that address all emissions sectors, the focus of its top priority measures is on the on-road transportation and building energy sectors. Successful decarbonization of these sectors would substantially reduce the region's GHG emissions, lead to substantial public health improvements, and contribute to dynamic, sustainable economic growth. Regional measures that address these sectors would also result in broader benefits to communities throughout the region, especially those that are most vulnerable to the impacts of climate change and that have disproportionately been burdened by air pollution and lack of access to opportunity.

The PCAP includes three regional measures, applicable to all three subregions (COGs) in the MSA, that are considered highest priority for implementation, are implementation-ready, and will likely be pursuing funding through the implementation grant phase of the U.S. Environmental Protection Agency's (EPA's) Climate Pollution Reduction Grant (CPRG) program. Described in more detail in Chapter 4, the three regional measures are:

- Light Duty Electric Vehicle Infrastructure
- Building Decarbonization
- Goods Movement Decarbonization

PCAP Additional Measures

In addition to the three regional measures listed above, the PCAP includes a broad range of measures that stem from the local, city, and subregional CAPs. These measures are geared towards addressing climate change and its impacts by reducing emissions associated with the sectors of energy, transportation, water, waste, offroad transportation, and agriculture. All measures in the SBCOG and WRCOG subregional CAPs are included, along with the additional measures that pertain to cool roofs and pavement, reach codes for new buildings, decarbonizing industrial processes, and congestion pricing. These have been incorporated into the PCAP as measures because they are not covered by the subregional CAPs. Because CVAG does not have a subregional CAP, measures are developed in the PCAP for implementation in that subregion. The PCAP also acknowledges state mandates, including the state measures that pertain to Renewable Portfolio Standards, Title 24 Building Energy Standards, vehicle emission standards (Pavley), Recycling and Waste Diversion, along with Water Conservation. In total, the PCAP's GHG reduction measures cover 25 Jurisdictions in San Bernardino County and 29 Jurisdictions in Riverside County. The complete set of measures is explained in *Chapter 4*. The GHG emissions reduction capability of these additional measures will be quantified in the CCAP.

LIDAC Assessment

Although climate change affects all communities, its impacts are not distributed equally. LIDACs are likely to be at greater risk from climate change hazards, including air pollution, wildfires, extreme heat and drought conditions, and other impacts that exacerbate inequities and affect the capacity to adapt. This PCAP provides a vulnerability assessment and presents an analysis of the co-benefits to GHG reduction measure implementation.

Document Organization

The PCAP is organized in six chapters and four Appendices that provide additional detail on topics covered in the PCAP. A summary of each component of the PCAP is presented below.

- **Chapter 1 – Introduction** This chapter introduces the Riverside−San Bernardino−Ontario MSA and the history of climate action planning in the region. Chapter 1 provides a brief overview of the purpose of the PCAP and the overall Climate Pollution Reduction Grant (CPRG) project, and describes the current policy and regulatory setting.
- **Chapter 2 – Existing Climate Action in the Region.** This chapter includes an in-depth discussion of the existing conditions and a summary of the existing GHG inventories and CAPs within the WRCOG, SBCOG, and CVAG subregions.
- **Chapter 3 – Greenhouse Gas Inventories.** This chapter presents a summary of the most recent GHG inventories developed by each subregion in the Riverside−San Bernardino−Ontario MSA, including a baseline GHG inventory for CVAG, a subregion that had not previously conducted a comprehensive inventory for all member jurisdictions.
- **Chapter 4 – PCAP Measures** This chapter presents the three priority regional measures for the Riverside−San Bernardino−Ontario MSA as well as a comprehensive summary of additional GHG reduction measures identified for each of the WRCOG, SBCOG, and CVAG subregions.
- **Chapter 5 – LIDAC Co-Benefits Analysis.** This chapter includes the LIDAC analysis, based on the EPA's framework to define, describe, and identify the LIDACs within the MSA. The analysis maps LIDACs using indicators of socioeconomic, environmental, climate, or other burdens and assesses direct and indirect co-benefits to LIDACs that would result from implementation of the PCAP's GHG measures.
- **Chapter 6 – References.**
- **Appendix A – WRCOG Local CAPs.** This appendix lists the GHG reduction measures in each of the seven local CAPs developed by WRCOG member jurisdictions, identifies key planning metrics used by each CAP (e.g., inventory years, targets), and identifies how each measure aligns with the measures included in the PCAP.
- **Appendix B – GHG Quantification Methods.** This appendix describes the methods used to develop the greenhouse gas inventories for each of the CVAG, SBCOG, and WRCOG subregions, as well as the methods used to estimate GHG emissions reductions for the PCAP's priority regional measures.
- **Appendix C − Authority to Implement.** This Appendix provides a review of authority for the primary supporting agencies responsible for implementing the GHG reduction measures within the MSA.
- **Appendix D – LIDAC and Co-Benefits Analysis Methods.** This appendix describes the methods and assumptions used to develop the co-benefits analysis for GHG reduction measures in the PCAP. It also includes the assumptions used to identify LIDAC census tracts based on the Council on Environmental Quality Climate and Economic Justice Screening Tool (CEJST).
- **Appendix E – Workforce Analysis Methods.** This appendix provides details and assumptions for how the workforce analysis was performed for the GHG reduction measures presented in Chapter 4

- **Appendix F – Engagement Summary.** This appendix provides an overview of the diverse engagement activities conducted during the development of the PCAP. This includes various engagement activities within the MSA, including collaboration with the Steering Committee, municipalities, Community Based Organizations, and LIDACs.

CHAPTER 1 – Introduction

Purpose

Through the Inflation Reduction Act of 2022 (IRA), Congress provided funding to the Environmental Protection Agency (EPA) to reduce greenhouse gas (GHG) emissions throughout the country via the Climate Pollution Reduction Grant (CPRG) program. Through the CPRG program, EPA is supporting state, territory, tribal, and local actions to reduce GHGs and associated criteria and toxic air pollution through deployment of new technologies, operational efficiencies, and solutions that will transition America equitably to a low-carbon economy. For each participant in the program, the first phase of the CPRG program is the development of a Priority Climate Action Plan (PCAP), which serves as a high-level roadmap for reducing GHG emissions at the local and regional scales. This document is the PCAP for the Riverside−San Bernardino−Ontario metropolitan statistical area (MSA), which includes the Counties of Riverside and San Bernardino, California (the region).

The primary purpose of the PCAP is to identify priority GHG measures in the region that are "implementation ready" and suitable for inclusion in a grant application for CPRG's Implementation Grant program. As such, the PCAP includes a focused list of regional, high-priority, implementation-ready measures to reduce GHG emissions within Riverside and San Bernardino counties and evaluates GHG emissions reductions that would be achieved through implementation of these measures. It also includes a comprehensive list of GHG reduction measures compiled from climate action plans that exist throughout the region, as described in Chapters 2 and 4. The measures in the PCAP, including the priority regional measures, focus on emissions reductions in the transportation and energy sectors, which are the biggest contributors to regional GHG emissions. However, the additional local and subregional measures included in the PCAP reduce emissions from the water, wastewater, solid waste, and agricultural sectors. Overall, the PCAP provides an early-stage regional framework for GHG emissions reduction that leverages existing and ongoing efforts throughout the Counties of Riverside and San Bernardino.

MSA Background

The Riverside-San Bernardino-Ontario MSA is faced with daunting climate and air quality challenges due to economic activity, population density, topography and weather patterns, as well as longstanding social justice issues. The MSA's 4.7 million residents represent approximately 12 percent of the state's population. The region, often referred to as the "Inland Empire", including the Coachella Valley, is home to many of the state's low-income disadvantaged communities, with disproportionate impacts related to climate change, air pollution, and hazardous air pollutants (HAPs).

The region is part of the South Coast Air Basin which, under the Clean Air Act, is in extreme non-attainment for ozone and serious non-attainment for PM 2.5. These pollutants, ozone and black carbon, a form of fine particulate matter, also contribute to the formation of GHG

emissions. The region's residents are breathing some of the worst air in the nation, especially in low-income disadvantaged communities that are adjacent to industrial sources and in proximity to transportation and goods movement−related activity. Air pollution contributes to asthma and lung damage, respiratory and cardiac diseases, cancer, birth defects, premature death, and other health issues.

This MSA is also intrinsically linked to the Los Angeles−Long Beach−Anaheim and Oxnard−Thousand Oaks−Ventura MSAs, which together represent the jurisdiction of the Southern California Association of Governments (SCAG). The SCAG region's GDP is $1.6 trillion and would be the 15th largest economy in the world in 2021. A significant contributor to this economic engine is the San Pedro Bay Ports and Inland Empire Logistics complex, which is the western gateway to both the U.S. supply chain and international commerce. This regional system is comprised of a network of highways and rail lines that are used to distribute goods to warehouses and intermodal facilities in the Inland Empire, with climate and air quality impacts reaching all the way into the Coachella Valley. The heavy-duty trucks, oceangoing vessels (OGVs), locomotives, aircraft, and off-road equipment that keep our nation's supply chain moving are directly impacting the health of Southern Californians as well contributing to climate change. Further, this expansive economic activity taxes the transportation system by contributing to congestion, increasing vehicle miles traveled, impacting safety, bifurcating communities, wearing on infrastructure, and other issues.

Priority Sectors for Reducing GHG Emissions

As noted in the Executive Summary and explained in more detail in Chapters 2 and 3, the transportation sector contributes more than half of the region's GHG emissions. This includes medium-duty and heavy-duty trucks used for goods movement. For passenger vehicles, the land use patterns that have developed over time—along with the associated highway networks, streetscapes, and parking infrastructure—prioritize and promote the usage of cars and trucks. To achieve deep reductions in GHG emissions, it is critical that the region advance zero-emission and near-zero-emission technologies through deployment of zero emission vehicles (ZEVs) and supportive infrastructure such as electric vehicle charging stations. Combined with a rapid uptake of ZEVs, the region must prioritize public transportation, walking, biking, and rolling, and other alternatives to single-occupancy trips, as well as more location-efficient land use that reduces the distance between key destinations.

Energy use by buildings is another critical sector, as it represents more than 35 percent of the region's GHG emissions. State and local regulations and initiatives are effectively advancing the construction of new buildings that are low or zero-carbon through an emphasis on energy efficiency, distributed renewable energy and storage, and a heavy focus on electrification. Successfully retrofitting existing buildings to be all-electric represents a major challenge since there are few regulatory tools available to force that change, but reducing the use of natural gas is a key aspect of building decarbonization, and a strategy that can improve indoor air quality and lower energy costs, which are especially relevant to low-income and disadvantaged households and businesses that disproportionately occupy older buildings.

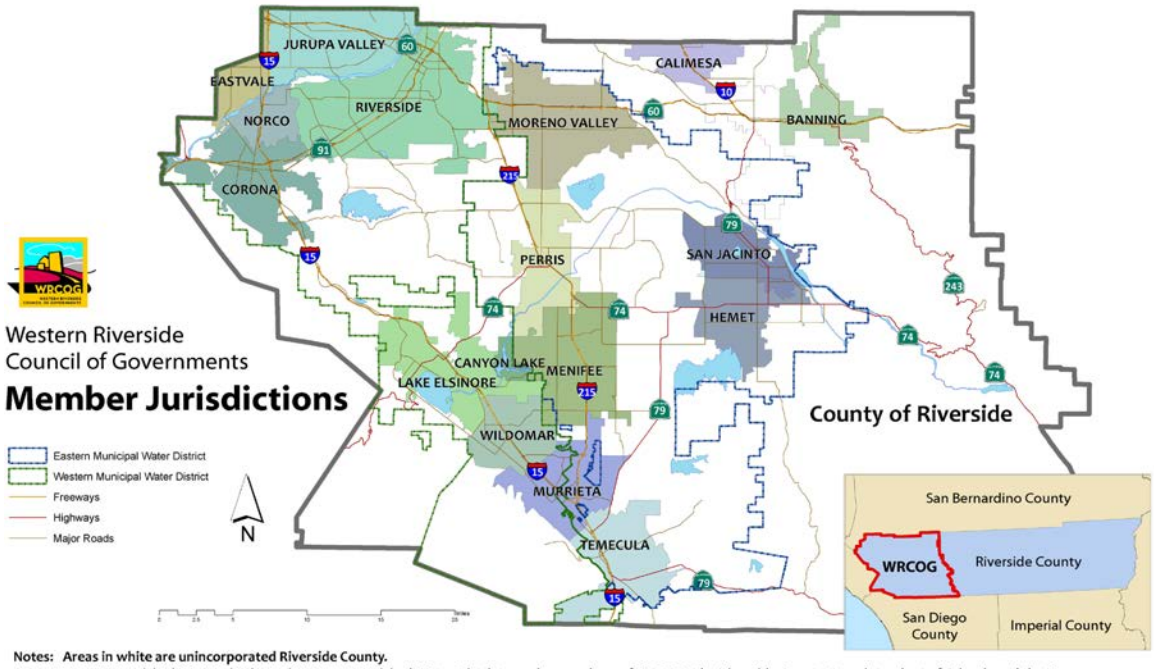
Councils of Governments

The city and county governments in the Riverside−San Bernardino−Ontario MSA are members of three separate councils of governments: the Western Riverside Council of Governments (WRCOG), the San Bernardino Council of Governments (SBCOG), and the Coachella Valley Association of Governments (CVAG). Each of these subregions is introduced below.

Western Riverside Council of Governments

The WRCOG subregion is a diverse area of 2,035 square miles, exhibiting a variety of socioeconomic conditions, infrastructure types, neighborhood compositions, geographies, and character. More than two million people live, work, and recreate in Western Riverside County, comprised of 18 incorporated cities and the western portion of unincorporated Riverside County. WRCOG has a strong legacy of collaboration among its member agencies (see **Figure 1-1**) and innovation in implementing programs that are environmentally, economically, and socially beneficial to the subregion.

Figure 1-1 Western Riverside Council of Governments Subregion

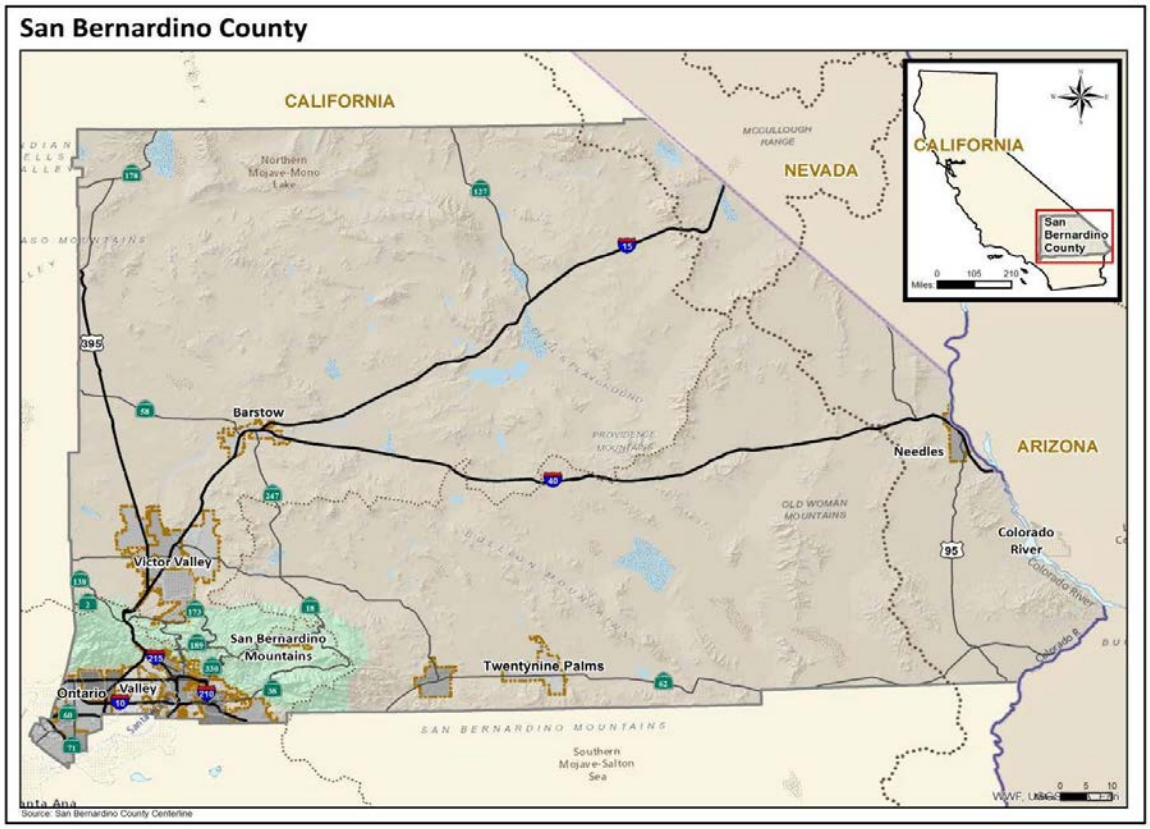


Notes: Areas in white are unincorporated Riverside County.
Eastern Municipal Water District and Western Municipal Water District are also members of WRCOG. The Riverside County Superintendent of Schools and the Morongo Band of Mission Indians are ex-oficio members.

San Bernardino Council of Governments

The SBCOG subregion encompasses approximately 20,000 square miles and is home to more than 2.2 million residents in San Bernardino County, which is the most geographically expansive county in the United States. The county is comprised of 24 cities and towns as well as the unincorporated county (see **Figure 1-2**). San Bernardino has diverse geography, varied socioeconomic conditions, and vibrant communities. SBCOG has a long history of collaboration and information sharing amongst its members with the goal to strengthen San Bernardino County environmentally, economically, and socially. Formerly known as the San Bernardino Associated

Figure 1-2 SBCOG Subregion



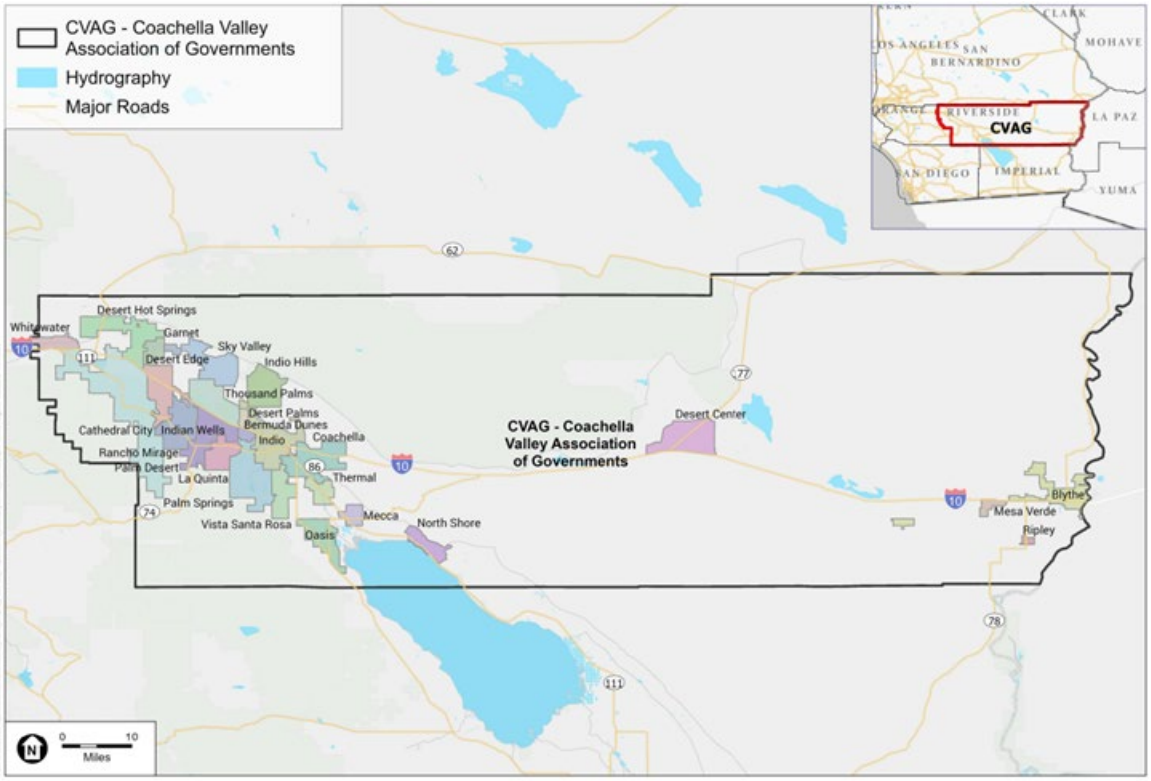
Governments, the San Bernardino County Transportation Authority and San Bernardino Council of Governments (SBCTA/SBCOG) were reformed as sister agencies in 2016, focusing on multimodal transportation initiatives and regional planning/policy, respectively, within San Bernardino County. San Bernardino Associated Governments continues as a Joint Powers Authority functioning as a Council of Governments (SBCOG).

Coachella Valley Association of Governments

The CVAG subregion represents Central and Eastern Riverside County, the area known as the Coachella Valley (see **Figure 1-3**). CVAG supports an enhanced quality of life and balanced growth for residents in this area by coordinating efforts and providing solutions to the collective issues that face the local government and tribes that make up its membership.

CVAG consists of 10 cities, Riverside County, the Agua Caliente Band of Cahuilla Indians, and the Cabazon Band of Mission Indians, and represents approximately 700,000 residents. The cities and tribes represented in the CVAG subregion are located in a desert climate. Faced with the growing reality of climate change impacts such as drought, heatwaves, and temperature extremes, climate action is increasingly important for the members of CVAG to build resiliency.

Figure 1-3 CVAG Subregion



SOURCE: UrbanFootprint, 2024; ESA, 2023

Inland Empire PCAP

Policy and Regulatory Background

National

Federal and state laws enable and inform local actions. As such, the PCAP considers applicable national and federal laws (**Table 1-1**) and recognizes that future amendments to measures may be needed to address future federal and state regulations.

Table 1-1
Relevant Federal Laws and Regulations

Legislation / Regulation	Year	Description
Clean Air Act	1970	Established a comprehensive framework for reducing harmful air pollution.
Corporate Average Fuel Economy Standards	1975	Established fuel efficiency standards for passenger cars and light trucks.
Code of Federal Regulations, Title 40, Part 89	1994	Established emissions standards for off-road compression-ignition engines.
Massachusetts v. Environmental Protection Agency	2007	The United States Supreme Court ruled that carbon dioxide is an air pollutant under the Clean Air Act and authorized the U.S. Environmental Protection Agency to regulate greenhouse gas emissions.
Phase 2 Heavy-Duty National Program	2016	Established emissions standards for heavy-duty trucks through model year 2027.

According to the EPA, transportation emissions have accounted for the largest portion of United States GHG emissions in recent years (USEPA, 2022). Federal climate change legislation has therefore focused on curbing emissions from the transportation sector by regulating fuel consumption standards for light-duty vehicles, and for medium- and heavy-duty trucks and engines. These fuel efficiency standards are defined for new vehicle model years and are regulated under the Clean Air Act (CAA) and the Corporate Average Fuel Economy (CAFE) program.

State

Over the past 30 years, the State of California has enacted its own legislation to address climate change (**Table 1-2**). In 2006, the Global Warming Solutions Act (AB 32) was enacted to address emissions from all sources throughout the state. AB 32 authorized CARB to implement a comprehensive program (Climate Change Scoping Plan) to achieve the state's targets of reducing GHG emissions to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The first Scoping Plan, adopted by CARB in 2008, provided a statewide plan for reducing GHG emissions down to 1990 levels by 2020.

Table 1-2
Relevant State Laws, Regulations, and Policies

Legislation / Regulation	Year	Description
Transportation		
AB 1493 Clean Car Standards	2002	Established emissions reduction requirements for new passenger vehicles from 2009 to 2016.
EO S-01-07 Low Carbon Fuel Standard	2007	Established the State of California's Low Carbon Fuel Standard and an emissions reduction target of at least 10 percent of the carbon intensity of the state's transportation fuels by 2020. With the adoption of the 2022 Scoping Plan, the standard has been revised to a reduction of at least 20 percent.
SB 375	2008	Directed the California Air Resources Board to set regional targets for GHG emissions reductions from passenger vehicles.
AB 1493 Amendments	2009	Cemented the state's enforcement of the legislation starting in 2009, while providing vehicle manufacturers with new compliance flexibility.
Advanced Clean Cars Program	2012	Combined the control of smog-causing pollutants and GHG emissions into a single coordinated package of regulations to guide the development of environmentally advanced cars.
Mobile Source Strategy	2016	Described the strategy for transitioning to zero-emission vehicles, or ZEVs, with a goal of 1.5 million ZEVs by 2025 and 4.2 million ZEVs by 2030. The Mobile Source Strategy includes more stringent GHG emissions requirements for light-duty vehicles beyond 2025, and calls for increased deployment of ZEV trucks.
Advanced Clean Cars Update	2017	Affirmed that adopted GHG emissions reduction standards remain appropriate for 2022 through 2025 model years.
AB 2127	2018	Requires the CEC, working with CARB and the CPUC, to prepare and biennially update a statewide assessment of the EV charging infrastructure needed to support the levels of EV adoption required for the state to meet its goals of putting at least 5 million ZEVs on California roads by 2030 and reducing emissions of GHGs to 40 percent below 1990 levels by 2030.
EO B-48-15	2018	Established a statewide goal of at least 5 million ZEVs on state roads by 2030, and installation of 200 hydrogen fueling stations and 250,000 ZEV chargers.
EO N-79-20	2020	Established a target that 100 percent of in-state sales of new passenger cars and trucks be zero-emission by 2035 and that 100 percent of medium- and

Table 1-2
Relevant State Laws, Regulations, and Policies

Legislation / Regulation	Year	Description
		heavy-duty vehicles in the state be zero-emission by 2045 and by 2035 for drayage trucks.
Advanced Clean Cars I/II (ACC I/II)	2022	Requires that by 2035 all new passenger cars, trucks, and SUVs sold in California will produce zero emissions. It amends the Zero-Emission Vehicle Regulation to require an increasing number of ZEVs, and relies on advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric, and plug-in hybrid EVs, to meet air quality and climate change emissions standards. It also amends the Low-Emission Vehicle Regulations to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions while the sector transitions toward 100 percent electrification by 2035.
Advanced Clean Trucks (ACT)	2021	Establishes a manufacturer's ZEV sales requirement and a one-time reporting requirement for large entities and fleets. It is a holistic approach to accelerate a large-scale transition of zero-emission medium- and heavy-duty vehicles from Class 2b to Class 8. Manufacturers who certify Class 2b − 8 chassis or complete vehicles with combustion engines would be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55 percent of Class 2b – 3 truck sales, 75 percent of Class 4 – 8 straight truck sales, and 40 percent of truck tractor sales
Advanced Clean Fleets (ACF)	2023	Introduction of zero-emission technologies into California's truck and bus fleets requiring fleets that are well suited for electrification to transition to zero-emission vehicles (ZEV) through requirements to both phase-in the use of ZEVs for targeted fleets and requirements that manufacturers only manufacture ZEV trucks starting in the 2036 model year. Components of ACF include manufacturer sales mandate, drayage fleets, high priority and federal fleets, and state and local agency fleets.
In-Use Locomotive Regulation	2023	Operators will now be required to pay into a spending account, and the amount will be determined by the emissions they create while operating in California. Companies will be able to use the funds to upgrade to cleaner locomotive technologies. Locomotives also will have a 30-minute idling limit. Additionally, switch, industrial, and passenger locomotives built in 2030 or after will be required to operate in zero-emissions configurations while in California, and in 2035 for freight line haul.
Energy		
SB 1078	2002	Required that 20 percent of electricity retail sales be served by renewable resources by 2017.
CALGreen Code (Title 24, Part 11)	2011	Established the first mandatory green building standards code in the country.
SB 350	2015	Accelerated implementation of SB 1078 and mandated a 50 percent Renewables Portfolio Standard, or RPS, by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires that 65 percent of RPS procurement be derived from long-term contracts of 10 or more years.
CALGreen Code Update	2016	Affirmed energy standards for newly constructed buildings, and additions and alterations to existing buildings. Added requirements for demand reductions during critical peak periods and future solar electric and thermal system installations.
SB 100 California Renewables Portfolio Standard Program	2018	Established a goal of supplying 100 percent of the state's electricity from clean sources by 2045.
SB 596	2021	Requires CARB, by July 1, 2023, to develop a comprehensive strategy for the state's cement sector to achieve net zero emissions of GHGs associated with cement used in California as soon as possible, but no later than December 31,

Table 1-2
Relevant State Laws, Regulations, and Policies

Legislation / Regulation	Year	Description
		2045. The law establishes an interim target of 40 percent below the 2019 average GHG intensity of cement by December 31, 2035.
SB 1020	2022	Adds interim renewable energy and zero-carbon energy retail sales of electricity targets to California end-use customers set at 90 percent in 2035 and 95 percent in 2040. It accelerates the timeline required to have 100 percent renewable energy and zero-carbon energy procured to serve state agencies from the original target year of 2045 to 2035. This law requires each state agency to individually achieve the 100 percent goal by 2035, with specified requirements.
SB 905	2022	Requires CARB to create the Carbon Capture, Removal, Utilization, and Storage Program to evaluate, demonstrate, and regulate carbon capture, utilization, or storage and CO_2 removal projects and technology.
SB 1137	2022	Prohibits the development of new oil and gas wells or infrastructure in health protection zones, as defined, except for purposes of public health and safety or other limited exceptions. This law requires operators of existing oil and gas wells or infrastructure within health protection zones to undertake specified monitoring, public notice, and nuisance requirements.
SB 1075	2022	Requires CARB, by June 1, 2024, to prepare an evaluation that includes policy recommendations regarding the use of hydrogen, and specifically the use of green hydrogen, in California; a description of strategies supporting hydrogen infrastructure, including identifying policies that promote the reduction of GHGs and short-lived climate pollutants; a description of other forms of hydrogen to achieve emission reductions; and other required elements.
SB 1206	2022	Mandates a stepped sales prohibition on newly produced high-GWP HFCs to transition California's economy toward recycled and reclaimed HFCs for servicing existing HFC-based equipment. This law also requires CARB to develop regulations to increase the adoption of very low-, i.e. GWP <10, and no-GWP technologies in sectors that currently rely on higher-GWP HFCs.
Waste and Water		
AB 341	2011	Required each city, county, and regional agency to develop a source reduction and recycling element of an integrated waste management plan containing specified components, including a source reduction component, a recycling component, and a composting component. With certain exceptions, the source reduction and recycling element of that plan was required to divert 75 percent of all solid waste from landfill disposal or transformation by 2020, through source reduction, recycling, and composting activities.
AB 1826	2014	Required any business, defined as a commercial or public entity that generates more than 4 cubic yards of commercial solid waste per week or is a multifamily residential dwelling of 5 units or more, to arrange for recycling services.
SB 1383	2016	Established emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants, including methane by 40 percent, HFC gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030.
SB 606 and AB 1668	2018	Required urban and agricultural water suppliers to enact new urban efficiency standards for indoor use, outdoor use, and water lost to leaks.
Statewide Emissions Reduction Targets		
EO S-3-05	2005	Established the state's first GHG emissions reductions targets: reduction to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050.
AB 32, Global Warming Solutions Act	2006	Codified EO S-3-05's 2020 goal and authorized CARB to implement a comprehensive, multiyear program to reduce GHG emissions from all sources throughout the state.

Table 1-2
Relevant State Laws, Regulations, and Policies

Legislation / Regulation	Year	Description
SB 535, Greenhouse Gas Reduction Fund and Disadvantaged Communities	2012	Required that 25 percent of all funds allocated pursuant to an investment plan for the use of state monies collected through a Cap-and-Trade program be allocated to projects that benefit disadvantaged communities, and that at least 10 percent of these be spent on projects located in disadvantaged communities.
EO B-30-15	2015	Established a GHG emissions reduction target of 40 percent below 1990 levels by 2030.
SB 32, California Global Warming Solutions Act of 2006: Emissions limit	2016	Codified EO B-30-15's 2030 goal.
AB 398, California's Cap-and-Trade Program	2017	Extended the state's Cap-and-Trade Program through 2030, a key strategy for reducing GHGs in the state. The Cap-and-Trade Program sets total allowable emissions for facilities and creates carbon offset credits through carbon sequestration projects.
EO B-55-18	2018	Established a target to achieve carbon neutrality (net zero GHG emissions) by 2045.
AB 1279	2022	Established the policy of the state to achieve net zero GHG emissions as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels.

NOTES:

Abbreviations: 2022 Scoping Plan = 2022 Scoping Plan for Achieving Carbon Neutrality; AB = Assembly Bill; CALGreen Code = California Green Building Standards Code; CARB = California Air Resources Board; CEC = California Energy Commission; CNRA = California Natural Resources Agency; CO_2 = carbon dioxide; CPUC = California Public Utilities Commission; EO = Executive Order; EV = electric vehicle; GHG = greenhouse gas; GWP = global warming potential; HFC = hydrofluorocarbon; RPS = Renewable Portfolio Standard; SB = Senate Bill; ZEV = zero-emission vehicle.

By 2016, California had met the AB 32 target set for 2020. In the same year, then-Governor Jerry Brown signed SB 32, which established a new 2030 target to reduce GHG emissions by 40 percent below 1990 levels, as established by his EO B-30-15 (2015). In December 2017, CARB approved an update to the Climate Change Scoping Plan (2017 Scoping Plan Update), which outlined the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels.

In 2018, Governor Brown issued EO B-55-18, establishing a statewide goal to reach carbon neutrality by 2045, and maintain net negative emissions thereafter. In September 2022, Governor Newsom signed AB 1279, which codified EO B-55-18 by requiring that the state achieve net zero GHG emissions no later than 2045 and reduce direct anthropogenic GHG emissions 85 percent below 1990 levels by 2045. In December 2022, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan), which lays out a path to achieve the statewide goals codified in AB 1279.

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CHAPTER 2 – Existing Climate Action in the Region

WRCOG

WRCOG has long been a leader in promoting sustainability through its adopted Sustainability Framework, Western Riverside Energy Partnership (WREP), HERO Program (an energy efficiency and water conservation financing program), and Western Riverside County Clean Cities Coalition (CCC). WRCOG's first Subregional Climate Action Plan project, completed in 2014 (more detail provided below), grew out of those efforts and focused on alignment with the state's Global Warming Solutions Act of 2006 (also known as Assembly Bill [AB] 32), which called for statewide GHG emissions to be reduced to 1990 levels by the year 2020. With the passing of Senate Bill [SB] 32 in 2016, the state updated its emissions target to 40 percent below 1990 levels by the year 2030. This development spurred WRCOG to update its Subregional CAP, an effort that was completed in 2021 (also described in more detail below). Although some WRCOG member jurisdictions did not participate in these subregional CAP projects, both efforts included communitywide GHG inventories for all WRCOG jurisdictions, as described in the next section.

Table 2-1 identifies the 12 WRCOG jurisdictions that participated in the 2014 Subregional CAP effort, and the 13 that participated in the 2021 update. Nine jurisdictions were participants in both efforts. Table 2-1 also identifies the seven WRCOG member jurisdictions that have developed or are in the process of developing a local CAP independent of the subregional CAP efforts. Notably, every jurisdiction in the WRCOG subregion has engaged in climate action planning at the local or subregional scale, or in some cases both. For example, the cities of Riverside and Perris used WRCOG's 2014 Subregional CAP as a foundation to develop a customized local CAP, while the cities of Beaumont and Lake Elsinore, which were participants in the 2022 Subregional CAP update, have developed local CAPs.

WRCOG Greenhouse Gas Emissions Inventories

The WRCOG subregional GHG inventory includes the GHG emissions resulting from activities taking place throughout the community by residents, businesses, and local governments and creates an emissions benchmark against which each jurisdiction can set emissions reduction targets and measure future progress. It also provides an understanding of where GHG emissions originate and allows a jurisdiction to develop effective policies, strategies, and programs to reduce emissions.

Table 2-1
CAP Activity by WRCOG Members

Member	Participated in 2014 Subregional CAP	Participated in 2022 Subregional CAP	Independently Developed, or In-Progress CAP	Municipally Owned Utility[a]
Banning	✓	✓		✓
Beaumont		✓	✓	
Calimesa	✓	✓		
Canyon Lake	✓	✓		
Corona			✓	✓
Eastvale	✓	✓		
Hemet	✓			
Jurupa Valley	✓	✓		
Lake Elsinore		✓	✓	
Menifee		✓		
Moreno Valley			✓	✓
Murrieta			✓	
Norco	✓	✓		
Perris	✓	✓		
Riverside	✓		✓	✓
San Jacinto	✓	✓		
Temecula	✓	✓		
Wildomar	✓	✓		
County of Riverside			✓	

NOTE:

a. Municipally owned utilities provide energy and/or water and wastewater services to their communities and pursue individual efficiency and sustainability efforts.

As part of WRCOG's 2022 Subregional CAP update, GHG emissions inventories were compiled for all WRCOG jurisdictions in each subregion.[5] Inventory data was first aggregated from several existing sources, including the 2010 baseline inventories developed for the participants in the 2014 Subregional CAP, as well as several inventories that had been developed independently by non-participating jurisdictions. New community inventories were then developed for calendar year 2017 for all WRCOG jurisdictions, using a common set of methodologies and data sources. The 2010 inventories were then updated as needed to add the sectors not included in the 2014 Subregional CAP (i.e., off-road equipment, freight rail, commuter rail, water, and agriculture). In addition, several adjustments were made to the 2010 inventories to ensure methodological consistency across the two inventory years. This included new vehicle miles travelled (VMT) modeling and solid waste emissions estimates for 2010 that match the methodologies used to

5 Note: The Morongo Band, Eastern Municipal Water District, and Western Municipal Water District did not participate in the Subregional CAP or contribute a GHG inventory to this effort, so they are not represented here.

develop the 2017 inventories. It also included backcasting of water and wastewater emissions from 2017 due to unresolved questions about methods and available data for 2010. A full report on the subregional inventory update, including emissions summary tables for each jurisdiction, is included as Appendix C of the 2022 Subregional CAP Update. The methods and data sources used for the inventory update can be found in Appendix D of the 2022 Subregional CAP Update.

Table 2-2 summarizes the community-wide inventories developed for the 19 WRCOG member jurisdictions, including baseline community inventories for the year 2010 and updated community inventories for the year 2017. Community-wide inventories encompass the GHG emissions resulting from activities taking place within each jurisdiction's boundaries, where the local government has jurisdictional authority. They also include emissions from some activities taking place outside the boundaries that support activities within the jurisdiction (for example, solid waste generated by a community that is sent to landfill areas outside its boundary).

Table 2-2
WRCOG Subregion – 2010 and 2017 Community GHG Emissions by Sector ($MTCO_2e$)

Sector	2010 Emissions	2017 Emissions	2017 % of Total	2010–2017 % Change
On-Road Transportation	5,468,974	4,831,298	44.1%	-11.7%
Residential Energy	2,740,057	2,196,196	20.0%	-19.8%
Non-Residential Energy	2,839,875	2,099,759	19.2%	-26.1%
Solid Waste	453,701	586,687	5.4%	29.3%
Off-Road Equipment	417,427	532,816	4.9%	27.6%
Agriculture	322,410	251,803	2.3%	-21.9%
Large Stationary Sources[a]	15,909	170,723	1.6%	973.1%
Water	213,224	162,430	1.5%	-23.8%
Wastewater	97,158	79,485	0.7%	-18.2%
Freight Rail	36,658	36,036	0.3%	-1.7%
Commuter Rail	9,262	13,704	0.1%	48.0%
Total – With Large Stationary Sources[b]	**12,614,655**	**10,960,936**	**100.0%**	**-13.1%**
Total – Without Large Stationary Sources[b]	**12,598,746**	**10,790,213**		**-14.4%**

NOTES:

a. In 2017, there were nine facilities within the WRCOG region that were regulated under Cap and Trade: 3M Corona, All American Asphalt, and Dart Container Corporation of California in Corona; Pacific Clay Products in Lake Elsinore; SDG&E Compressor Station in Moreno Valley; Sierra Aluminum Company and University of California, Riverside in Riverside; and Infineon Technologies Americas Corp and Pechanga Resort and Casino in Temecula. Of these nine facilities, only one was reported in 2010, the Dart Container Corporation of California.
b. Totals may not add up due to rounding.

Table 2-2 profiles GHG emissions across the entire subregion by sector, while **Table 2-3** breaks down the subregion's emissions by the 19 WRCOG member jurisdictions. Both tables include emissions from three sectors that are quantified regionally – Agriculture, Freight Rail, and Large Stationary Sources that are regulated by CARB under the state's Cap and Trade program, which requires that power generators, refineries, and other large stationary emitters that emit more than 25,000 $MTCO_2e$ reduce their emissions over time in line with the California Global Warming

Table 2-3
Jurisdictions Included in the WRCOG Subregional GHG Inventory

Jurisdiction	Participated in 2014 Subregional CAP?	Baseline Population[a]	2010 Emissions ($MTCO_2e$)[b]	2017 Emissions ($MTCO_2e$)
Banning	Yes	31,129	265,042	276,005
Beaumont	No	35,901	214,953	191,462
Calimesa	Yes	11,020	63,815	59,311
Canyon Lake	Yes	10,728	53,981	29,259
Corona	No	143,287	1,367,632	1,103,700
Eastvale	Yes	51,641	214,556	220,413
Hemet	Yes	83,449	406,117	371,329
Jurupa Valley	Yes	100,300	523,067	493,902
Lake Elsinore	No	54,848	349,396	309,738
Menifee	No	81,118	415,503	378,097
Moreno Valley	No	191,362	806,728	793,859
Murrieta	No	98,573	567,296	509,839
Norco	Yes	26,850	207,963	198,809
Perris	Yes	71,755	323,745	328,640
Riverside	Yes	304,739	2,764,004	2,360,779
San Jacinto	Yes	47,615	192,599	203,062
Temecula	Yes	92,858	640,938	610,370
Wildomar	Yes	31,859	150,252	154,973
Unincorporated WRCOG	No	702,510	2,712,090	1,908,826
Subtotal		2,171,540	12,239,678	10,502,374
Agriculture			322,410	251,803
Large Stationary Sources[c]			15,909	170,723
Freight Rail			36,658	36,036
Total – All Sources			**12,614,655**	**10,960,936**

NOTES:

a. Socioeconomic data is from the Riverside County Traffic Analysis Model (RivTAM).
b. For two cities, Eastvale and Jurupa Valley, 2011 was used as the baseline year.
c. In 2017, there were nine facilities within the WRCOG subregion that were regulated under Cap and Trade: 3M Corona, All American Asphalt, and Dart Container Corporation of California in Corona; Pacific Clay Products in Lake Elsinore; SDG&E Compressor Station in Moreno Valley; Sierra Aluminum Company and University of California, Riverside in Riverside; and Infineon Technologies Americas Corp and Pechanga Resort and Casino in Temecula. Of these nine facilities, only one was reported in 2010, the Dart Container Corporation of California.

Solutions Act of 2006 (AB 32).[6] With CARB as the enforcing agency, local and regional governments generally do not have jurisdictional authority over these sources. For this reason, local jurisdictions with large stationary sources typically remove those sources from their baseline GHG inventory and emissions forecasts when developing a climate action plan in order to focus

6 California's Cap and Trade program requires that power generators, refineries, and other large stationary emitters reduce their emissions over time in line with the California Global Warming Solutions Act of 2006 (AB 32). Collectively, sources regulated by Cap and Trade represent approximately 85 percent of the State's total emissions.

on sources over which they have jurisdictional control or influence. Table 2-3 presents one emissions total for the subregion that is inclusive of these sources and one that excludes them.

Table 2-2 shows that total emissions, excluding large stationary sources covered under the state's Cap and Trade program, decreased by approximately 14 percent from 2010, with the largest reduction coming from the non-residential energy sector, which decreased by approximately 26 percent, or 740,116 metric tons of carbon dioxide equivalent per year ($MTCO_2e$). For both years, on-road transportation is the biggest contributor to the subregion's emissions, followed by building electricity, building natural gas, and solid waste. In terms of emission trends, on-road transportation was 11.7 percent lower in 2017 than in 2010 while residential and non-residential energy emissions decreased by approximately 20 and 26 percent, respectively. Large stationary sources formed the anomalous sector, increasing by nearly 1,000 percent from 2010 to 2017. This is due to the addition of eight large industrial facilities to the subregion's mandatory reporting list as determined by CARB.

Figure 2-1 provides a graphical depiction of each sector's contribution to the 2017 WRCOG Subregional Inventory, showing on-road transportation at 44 percent, followed by building electricity at 25.6 percent, building natural gas at 13.6 percent, solid waste at 5.4 percent, offroad equipment at 4.9 percent, and agriculture at 2.3 percent. All other sectors contributed less than 2 percent to the total. **Figure 2-2** depicts the 2017 inventory results graphically, by jurisdiction.

WRCOG Subregional CAP (2014)

The WRCOG's 2014 Subregional CAP, which included 12 participating jurisdictions as noted in Table 2-1, set an overall emissions reduction target of 15 percent below 2010 levels by 2020, and included a range of state, regional, and local reduction measures for the participants to achieve that target. The 2014 WRCOG Subregional CAP did not establish a reduction target beyond 2020.

WRCOG Subregional CAP Update (2021)

The 2022 Subregional CAP Update represents an update of the 2014 effort, establishing a 2030 GHG emissions target for the 13 participating jurisdictions based on consistency with SB 32. The 2022 Subregional CAP provides a framework for participating jurisdictions to demonstrate consistency with the subregional target by adopting and implementing local actions to reduce emissions.

Emissions Inventories and Forecasts

The 2022 Subregional CAP included GHG emissions inventories for the 13 participating jurisdictions for the years 2010 and 2017, as well as forecasts for the years 2030 and 2050 under "business-as-usual" (BAU) conditions, representing emissions expected in the absence of state, regional, and local actions taken to reduce emissions over time. BAU emissions forecasts[7] were

[7] A business-as-usual (BAU) forecast assumes that no action is taken to reduce GHG emissions. Future emissions are projected forward using growth indicators such as population, housing, and employment. Typically, CAPs include an Adjusted BAU forecast accounts for future growth under BAU conditions but also accounts for anticipated reductions from existing federal and state mandates or regulations that are unaffected by local action.

Figure 2-1 2017 WRCOG Subregional Inventory Emissions by Sector – All Jurisdictions

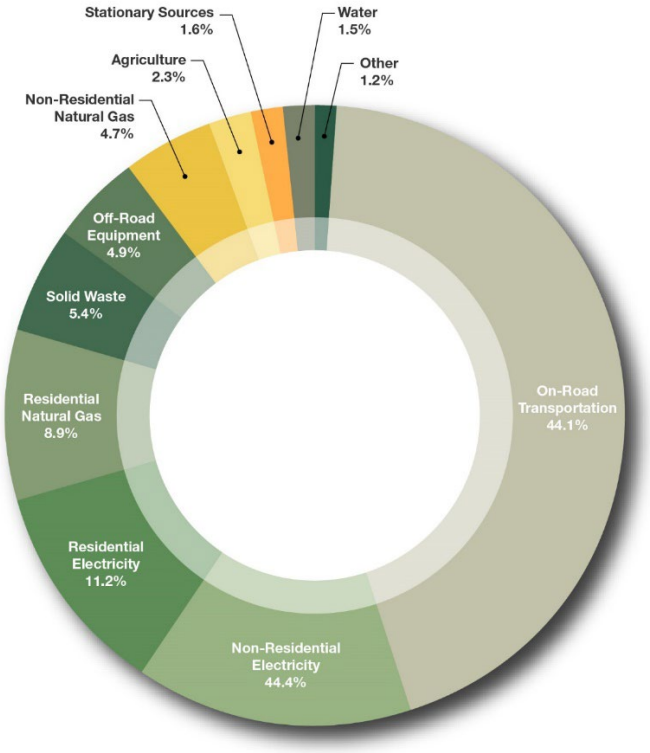
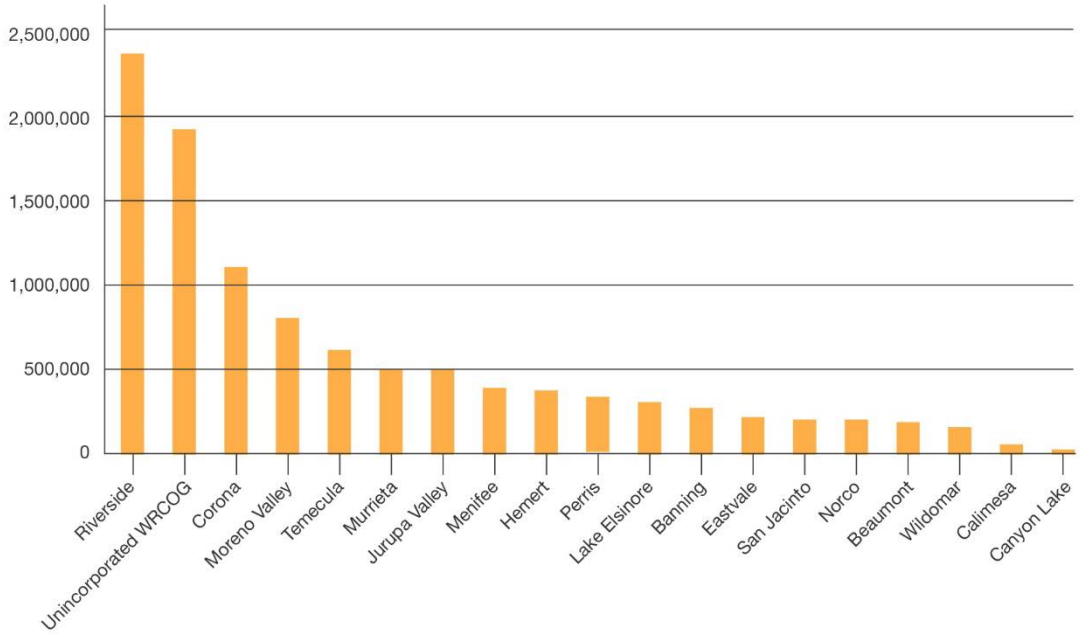


Figure 2-2 WRCOG 2017 Community Emissions by Jurisdiction ($MTCO_2e$)



developed using estimates for population, household, and employment growth within each participating city.[8] **Table 2-4** summarizes emissions by sector for the 2010 and 2017 inventory years and the 2030 and 2050 forecast years. Overall, BAU emissions are expected to increase 30 percent from 2017 to 2030, and nearly 75 percent from 2017 to 2050. Note that the BAU forecasts do not include large stationary sources, freight rail emissions, or agriculture emissions as the local jurisdictions do not have control over those sources. **Figure 2-3** shows the breakout of community BAU emissions by sector for the year 2030.

Table 2-4
WRCOG Subregional CAP: GHG Inventories and Business-As-Usual Emissions by Sector for Participating Jurisdictions (MTCO2e/year)

Sector	2010 Inventory	2017 Inventory	2030 BAU Forecast	2050 BAU Forecast	2017–2030 % Change	2017–2050 % Change
On-Road Transportation	1,857,367	1,726,513	2,223,617	3,020,916	28.8%	75.0%
Residential Energy	874,892	812,269	1,026,409	1,346,671	26.4%	65.8%
Non-Residential Energy	578,616	535,539	727,827	1,014,622	35.9%	89.5%
Solid Waste	140,524	169,090	202,770	254,585	19.9%	50.6%
Off-Road Equipment	97,470	144,830	178,137	224,116	23.0%	54.7%
Water	47,140	43,782	89,079	112,789	103.5%	157.6%
Wastewater	17,620	18,679	23,121	29,955	23.8%	60.4%
Commuter Rail	2,182	3,341	4,028	5,086	20.6%	52.2%
Total	**3,615,811**	**3,454,042**	**4,474,988**	**6,008,739**	**29.6%**	**74.0%**

Emissions Reduction Target

The WRCOG Subregional CAP update uses an efficiency metric to establish a 2030 emissions reduction target that is consistent with California's statewide target for 2030 (as required by Senate Bill 32), with CARB's 2017 Climate Change Scoping Plan Update,[9] and with guidance from the Governor's Office of Planning and Research.[10] **Table 2-5** shows the derivation of WRCOG's 2030 efficiency target, based on emissions, population, and jobs data for participating jurisdictions.

8 Socioeconomic data is from the Riverside County Traffic Analysis Model (RivTAM).

9 In its 2017 Climate Change Scoping Plan Update, CARB recommends that local governments adopt a GHG reduction target consistent with the State's commitment to reach 40 percent below 1990 levels by 2030, as established by Senate Bill 32. Accounting for growth that has occurred since 1990, this is approximately equivalent to 50 percent below 2010 levels.

10 Governor's Office of Planning and Research, *General Plan Guidelines*, Chapter 8: Climate Change, 2017, p. 222-233.

Figure 2-3 WRCOG Subregional CAP: 2030 Community Emissions Business-As-Usual Forecast by Sector ($MTCO_2e$)

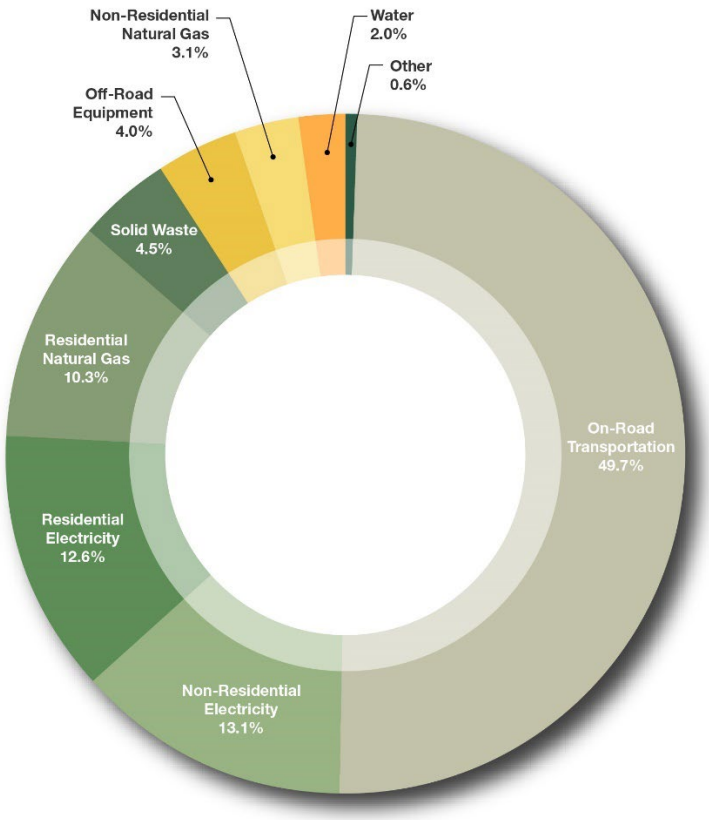


Table 2-5
Derivation of 2030 Efficiency Metric for WRCOG Subregional CAP

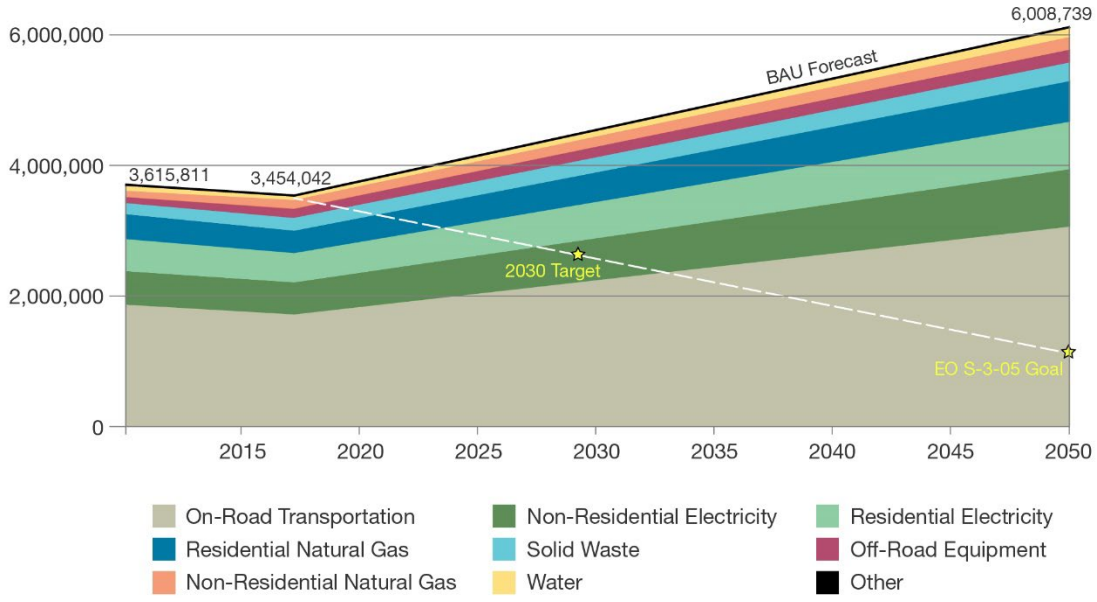
Data/Metric	Amount[a]
Baseline Subregional Emissions ($MTCO_2e$)[b]	3,615,811
2010 Population[c]	647,621
2010 Employment[c]	120,821
2010 Service Population (SP)	768,442
2010 (Baseline) GHG Efficiency Metric ($MTCO_2e$/SP)[d]	4.71
2030 GHG Efficiency Metric Target ($MTCO_2e$/SP)	**2.36**
2030 GHG Emissions Target (Total $MTCO_2e$)	**2,570,262**

NOTES:

a. Numbers represent the 13 jurisdictions participating in the 2022 WRCOG Subregional CAP update.
b. Includes land use sector emissions from Table 2-3.
c. Population and employment data from RivTAM.
d. GHG Efficiency Metric = emissions divided by service population (residents + jobs).

The Subregional CAP target for 2030 is 2.36 $MTCO_2e$ per service population[11] ($MTCO_2e$/SP), equivalent to 50 percent below the 2010 efficiency metric of 4.71 $MTCO_2e$/SP. Using the 2030 estimated service population of 1,089,094 (from Table 2-5), this efficiency target is equivalent to an absolute emission target of 2,570,262 $MTCO_2e$ by 2030, which is approximately 42 percent below the 2030 BAU emissions forecast of 4,474,988, depicted graphically in **Figure 2-4**. The Subregional CAP does not establish a reduction target for 2050; however, as can be seen in Figure 2-4, the 2030 target puts the WRCOG Subregion on a trajectory that is in line with the state's long-term goal established by Executive Order (EO) S-3-05, recognizing that the manner in which technologies, regulations, and markets develop between now and then will greatly affect the emissions trajectory and the role that local governments must play in meeting that target.

Figure 2-4 WRCOG Subregional CAP: GHG Business-As-Usual Forecasts and Reduction Target for 2030



The 2030 reduction target selected by each participating jurisdiction, as presented in their individual plans in Appendix A of the Subregional CAP, is derived in the same manner as the subregional target outlined above, resulting in an efficiency target that is equivalent to 50 percent below the local jurisdiction's 2010 emissions per service population.

GHG Reduction Measures

The 2022 Subregional CAP Update builds on the foundation of GHG measures that were developed for the first subregional effort by WRCOG in 2014, organizing the measures into the major economic sectors of Energy; Transportation and Land Use; Water and Wastewater; and Solid Waste. GHG reduction measures are grouped as state, regional, and local measures, based on the agency responsible for leading their implementation.

11 Service population is defined as the number of jobs plus the number of residents.

State-implemented measures primarily achieve GHG reductions through statewide regulations and programs, such as efficiency standards for passenger vehicles, reduction in carbon content of transportation fuels, and minimum renewable energy supply requirements for utilities. In addition, California's regulations mandate water conservation and waste diversion from landfills. Because of their regulatory nature, state measures apply to participating jurisdictions uniformly.

In the 2022 Subregional CAP Update, regional measures are those developed or administered at a level of government above the local jurisdiction but below the state. These programs often are more responsive to local context than statewide programs. An example of a regional measure for WRCOG is the planned Metrolink rail expansion in Western Riverside County, where service is expected to increase to 23 trains per weekday by 2025. This will reduce GHG emissions regionally by shifting trips from on-road vehicles to more efficient public transit. Regional measures require local participation but do not require local administration to achieve GHG reductions.

Local measures are more discretionary and dependent on local action, where participating jurisdictions voluntarily commit to a defined participation level (high, medium, or low) for each measure's implementation in their community.

Table 2-6 summarizes the relative contributions of state, regional, and local measures in reducing GHG emissions by the year 2030, while **Table 2-7** provides lists each of the state, regional, and local measures along with the estimated total annual GHG reductions associated with their implementation by the year 2030.

Through state and regionally implemented measures, the 13 participating jurisdictions are expected to reduce 2030 emissions annually by 1,309,642 $MTCO_2e$. Local measures implemented by participating jurisdictions in their communities would contribute an additional 257,663 $MTCO_2e$ per year, nearly enough for the Subregional CAP's participating jurisdictions as a whole to reach the 2030 target. On a city-by-city basis, four participating jurisdictions (Banning, Beaumont, Canyon Lake, and Lake Elsinore) have committed to enough local action to achieve their city-specific GHG reduction targets, as summarized in **Table 2-8** and discussed in more detail in the individual City summaries provided in Appendix A of the Subregional CAP. The results indicate that the other nine participants will need to strengthen their GHG reduction commitments in order to reach their targets.

Figure 2-5 illustrates graphically how the implementation of state, regional, and local measures in the 2022 WRCOG Subregional CAP are expected to reduce emissions over time.

Table 2-6
WRCOG Subregional CAP: 2030 GHG Reductions Achieved through State, Regional, and Local Measures

Category	2030 Reductions ($MTCO_2e$/year)	Percent Contribution
State Measures	1,209,035	77%
Regional Measures	100,606	6%
Local Measures	257,663	16%
Total Reductions	**1,567,305**	**100%**

Table 2-7
WRCOG Subregional CAP: 2030 Reductions for Participating Jurisdictions Achieved through State, Regional and Local Measures

State Measures by Sector		2030 Reduction Potential ($MTCO_2e$/year)
Energy		
SE-1	Renewables Portfolio Standard (RPS)	475,686
SE-2	California Building Energy Efficiency Standards (Title 24, Part 6)	69,799
Transportation and Land Use		
ST-3	Pavley/Advanced Clean Cars; Low Carbon Fuel Standard (LCFS)	497,709
Solid Waste		
SR-1	State Recycling and Waste Diversion Mandates	157,391
	Water and Wastewater	
SW-1	Water Conservation Mandates	8,450
Total State Reductions		**1,209,035**
Regional Measures by Sector		2030 Reduction Potential ($MTCO_2e$/year)
Transportation		
RT-1	Metrolink Expansion	1,834
RT-2	Telecommuting	25,110
RT-3	Regional Zero Emission Vehicle (ZEV) Initiatives	73,662
Total Regional Reductions		**100,606**
Local Measures by Sector		**2030 Reduction Potential ($MTCO_2e$/year)**
Energy		
LE-1	Expand Local Renewable Energy Production	53,947
LE-2	Community Choice/Utility Renewable Electricity	142,846
LE-3	Improve Energy Efficiency of Existing Buildings	16,528
LE-4	Building & Appliance Electrification	2,146
LE-5	Traffic & Street Light Upgrades	3,641
LE-6	Shade Trees	Not Quantified

Table 2-7
WRCOG Subregional CAP: 2030 Reductions for Participating Jurisdictions Achieved through State, Regional and Local Measures

Transportation		
LT-1	Bicycle Infrastructure Improvements	4,139
LT-2	Pedestrian Infrastructure Improvements	11,637
LT-3	Carshare & Carpool Programs	1,053
LT-4	Parking Pricing & Limited Requirements	11,250
LT-5	Increase Transit Service & Frequency	947
LT-6	Traffic Signal Coordination	2,332
LT-7	Increase Housing Density	N/A
LT-8	Increase Land Use Diversity	N/A
LT-9	Transit-Oriented Development	2,050
LT-10	Local ZEV Programs	1,954
LT-11	Subsidized Transit	3,194
Solid Waste		
LS-1	Zero Waste Initiatives	Not Quantified
Water & Wastewater		
LW-1	Increase Recycled Water Use	Not Quantified
Agriculture		
LA-1	Local Agriculture & Community Gardens	Not Quantified
Total Local Reductions[a]		**257,663**

NOTE:
a. Totals may not add up due to rounding.

Table 2-8
WRCOG Subregional CAP: Summary of Planned GHG Emissions Reductions by 2030, by Participating Jurisdiction

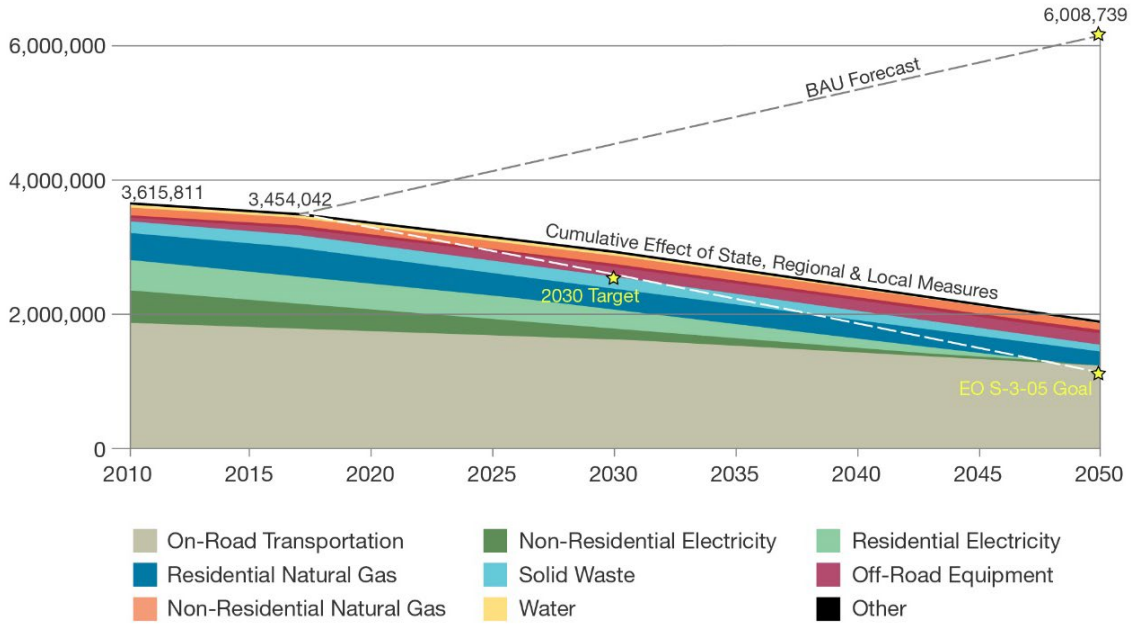
Jurisdiction	Planned 2030 Reductions ($MTCO_2e$)	Reductions Needed to Meet 2030 Target	Expect 2030 GHG Target to be Met?
Banning	242,389	187,466	Yes
Beaumont	90,549	83,557	Yes
Calimesa	30,772	38,605	No
Canyon Lake	12,397	348	Yes
Eastvale	77,887	117,248	No
Jurupa Valley	187,159	275,357	No
Lake Elsinore	146,367	136,204	Yes
Menifee	149,831	181,706	No
Norco	73,078	109,913	No
Perris	147,808	206,400	No

Table 2-8
WRCOG Subregional CAP: Summary of Planned GHG Emissions Reductions by 2030, by Participating Jurisdiction

Jurisdiction	Planned 2030 Reductions ($MTCO_2e$)	Reductions Needed to Meet 2030 Target	Expect 2030 GHG Target to be Met?
San Jacinto	106,789	150,557	No
Temecula	241,352	322,455	No
Wildomar	60,929	91,334	No
Subregional CAP Total[a]	**1,567,306**	**1,904,726**	**No**

NOTE:
a. Totals may not add up due to rounding.

Figure 2-5 WRCOG Subregional CAP: BAU Emissions Forecast and Reductions Achieved Through State, Regional, and Local Measures ($MTCO_2e$)



Existing Local CAPs

Seven local jurisdictions in the WRCOG subregion have either completed a local CAP, or they are currently in the process completing one. These local CAPs are briefly summarized in the following sections. A listing of the GHG reduction measures in each local CAP, including how each local measure corresponds to the GHG reduction measures in the 2022 Subregional CAP Update, is included in **Appendix A** to this document.

Sustainable Beaumont (October 2015)

Sustainable Beaumont, the city's community-wide CAP, was adopted in October 2015. Sustainable Beaumont sets 2020 and 2030 emissions reduction targets for the community and for

government operations that align with AB 32 (15 percent from 1990 levels by 2020) and the Governor's Executive Order S-3-05 (80 percent below 1990 levels by 2050). The CAP includes goals, policies, and actions at the community and municipal levels and demonstrates how implementation of local reduction measures, in combination with state actions, will enable the city to achieve its targets.

Although methods are not fully documented, the "adjusted BAU forecast" [12] in Sustainable Beaumont appears to account for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards); Low Carbon Fuel Standards, the 2008 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 33 percent renewables by 2020.

A review of Sustainable Beaumont indicates that nearly all of the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- Measure 6.2: Light-reflecting Surfaces for Energy Efficiency

Table A-1a and A-1b in Appendix A lists each state and local measure in the Sustainable Beaumont and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

City of Corona CAP Update (March 2019)

The City of Corona CAP, which was updated in March 2019, establishes goals and policies that incorporate environmental responsibility into the everyday management of its community operations. The City's commitment to community wide GHG emission reductions are set for the target years of 2030 and 2040. With this, the City is also on track with AB 32 reductions (15 percent from 1990 levels by 2020) and the Governor's Executive Order S-3-05 (80 percent below 1990 levels by 2050) for government operations. The CAP also includes a 2016 GHG emissions inventory, as well as GHG reduction measures which are described in detail in Chapter 3 of the CAP.

In its "adjusted BAU forecast," the City of Corona CAP accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards); Advanced Clean Cars regulation, Low Carbon Fuel Standards, the 2016 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 50 percent renewables by 2030.

A review of the City of Corona CAP indicates that nearly all the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- Measure 6.2: Light-Reflecting Surfaces for Energy Saving

Table A-2 in Appendix A lists each state and local measure in the City of Corona CAP Update, and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

12 An Adjusted BAU forecast accounts for future growth under BAU conditions but also accounts for anticipated reductions from existing federal and state mandates or regulations that are unaffected by local action.

City of Lake Elsinore CAP (December 2011)

The City of Lake Elsinore CAP, adopted in December 2011, sets community-wide GHG emissions targets for 2020 and 2030 (the City's General Plan horizon year) that are consistent with AB 32 and the state's longer term GHG reduction goal as expressed by the Governor's Executive Order S-3-05. The CAP demonstrates how the City of Lake Elsinore could meet its GHG emissions reduction targets through a combination of state-level measures and local measures, which are described in detail in Chapter 5 of the CAP.

In its "adjusted BAU forecast," the City of Lake Elsinore CAP accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards); additional car and truck efficiency regulations, Low Carbon Fuel Standards, the 2016 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 33 percent renewables by 2020.

A review of the City of Lake Elsinore CAP indicates that nearly all the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy
- Measure E-1.2: Cool Roof Requirements

Table A-3 in Appendix A lists each state and local measure in the Lake Elsinore CAP and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

City of Moreno Valley Draft CAP (March 2021)

The Draft Moreno Valley CAP (March 30, 2021) set community wide GHG emissions targets for 2030 and 2040 (the City's General Plan horizon year) based on guidance from CARB in its 2017 Scoping Plan, which advises that local communities should reduce emissions to no more than six $MTCO_2e$ per capita per year by 2030 and no more than two $MTCO_2e$ per capita by 2050 to be consistent with statewide targets. As such, the proposed targets for Moreno Valley are six $MTCO_2e$ per capita per year by 2030 and four $MTCO_2e$ per capita by 2040 (using a straight-line interpolation between CARB's 2030 and 2050 recommendations). The CAP demonstrates how the City of Moreno Valley could meet its GHG emissions reduction targets through a combination of state-level measures and local measures, which are described in detail in Chapter 4 of the CAP.

In its "BAU forecast," the City of Moreno Valley Draft CAP accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards), Advanced Clean Cars regulation, Low Carbon Fuel Standards, the 2019 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 50 percent renewables by 2030.

A review of the Draft Moreno Valley CAP indicates that nearly all the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- R-1: Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.

- PS-1: Participate in Savings by Design program to identify ways to improve energy efficiency for all new municipal buildings and facilities. As part of the Savings by Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10 percent.
- OR-1: Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.
- OR-2: Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles.
- NC-2: Reduce the need for landscape maintenance through native planting.

Table A-4 in Appendix A lists each state and local measure in the Draft Moreno Valley CAP and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

City of Murrieta CAP Update (January 2020)

In 2011, the City of Murrieta adopted its first CAP (2011 CAP), as part of the City's General Plan Update (GPU). In 2020, the city updated its CAP Update concurrently with a focused update of its General Plan to be consistent with state legislation and guidance released since the 2011 CAP was adopted. The 2011 CAP's GHG emissions baseline inventory was for the year 2009 and established emission forecasts for 2020 and 2035 with a GHG reduction target year of 2020, to align with state goals at that time. The 2020 CAP Update provides an updated baseline year of 2016, emissions forecasts for 2030, 2035, and 2050 with GHG emission targets for 2030 and 2035, to be consistent with SB 32. It also establishes a GHG reduction goal for 2050.

The CAP Update demonstrates how the City of Murrieta could meet its GHG emissions reduction target of 40 percent below 2016 levels by 2030 and 50 percent below 2016 levels by 2035, through a combination of state-level measures and local measures, which are described in detail in Chapter 3 of the CAP.

The City of Murrieta 2020 CAP Update accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards), Low Carbon Fuel Standards, the 2019 Title 24 energy efficiency standards, a Renewables Portfolio Standard of 60 percent renewables by 2030 (SB100), and maintaining a waste diversion goal of 75 percent, pursuant to AB 341.

A review of the City of Murrieta CAP indicates that nearly all the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- CSV-9: Urban Forest growth
- T-9: GHG Fee Program: Develop and implement a no-net-increase in GHG emissions threshold for new development projects in the City and develop a GHG Fee Program to offset remaining GHG emissions from new development that cannot be achieved through project design features or other CAP measures.

Table A-5 in Appendix A lists each state and local measure in the City of Murrietta CAP and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

City of Riverside CAP and Economic Prosperity Action Plan (January 2016)

The City of Riverside Restorative Growthprint, adopted in 2016, includes a full community climate action plan (CAP) as well as an Economic Prosperity Action Plan (EPAP) that is intended to spur local entrepreneurship and smart growth while advancing the City's GHG reduction goals. The CAP commits the City to a 2020 GHG reduction target consistent with AB 32 and includes an aspirational target for 2035. The CAP builds from its participation in the 2014 WRCOG Subregional CAP, incorporating the state and regional reduction measures from the WRCOG plan and adding more detail about local actions and programs to demonstrate how the City can achieve its 2020 target and make significant progress towards its 2035 target.

The City of Riverside CAP accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards), Low Carbon Fuel Standards, the 2013 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 33 percent renewables by 2020.

A review of the City of Riverside CAP indicates that nearly all the measures included in that plan (presented in Chapter B.3) are included in the 2022 WRCOG Subregional CAP, with the following exceptions:

- Measure E-5: UC Riverside Carbon Neutral Program
- Measure E-6: Riverside Public Utilities Technology Grants
- Measure T-20: Eco-Corridor

Table A-6a and A-6b in Appendix A lists each state, regional, and local measure in the City of Riverside CAP and EPAP and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

Since the 2016 Restorative Growthprint was adopted, the City of Riverside's has taken several additional steps to advance climate action:

1. Strategic Plan – Added climate action goals into the City's Strategic Plan (Envision Riverside 2025 Strategic Plan):

    a. Implement the requisite measures to achieve citywide carbon neutrality no later than 2040.

    b. Rapidly decrease Riverside's carbon footprint by acting urgently to reach a zero-carbon electric grid with the goal of reaching 100 percent zero-carbon electricity production by 2040.

2. Climate Action Plan – The City of Riverside selected a consultant to begin preparation of a new Climate Action and Adaptation Plan, which is fully funded and will launch in April 2024.

3. Fleet Electrification – The City of Riverside launched a Zero Emissions Vehicle Transition Plan in January 2024 to identify the projected number/location of electric vehicles, charging stations, solar panels and other supporting infrastructure, as well as the estimated GHG emission reductions.

4. Renewable Energy – The City of Riverside has over 230 megawatts of renewable resources including 116 MW of geothermal, 46 MW of wind energy and over 100 MW of solar PV energy and added 125 MW of renewable wind capacity on December 2023, increasing the Riverside Public Utility electric power mix from 50 percent to 75 percent renewable, non-GHG sourced power for the entire City.

5. Building Decarbonization – The City has implemented a Building Electrification Ordinance that requires new buildings to be all-electric as of January 1, 2023, which phases out natural gas infrastructure powered by fossil fuels.

6. Transformative Climate Projects:

    a. Eastside Climate Collaborative – The City received and implemented a competitive grant totaling $31,200,000 and leveraged an additional $47,000.000 to implement a wide array of physical improvements (100 solar installations, 100,000 water wise landscaping, 2,000 trees planted, mobility hub, etc.) resulting in 29,306 tons of CO_2e determined by UC Riverside and validated by CARB.

    b. Northside Ag Innovation District – A first of its kind project in the US consisting of solar greenhouses and agri-voltaics generating renewable, non-GHG sourced energy, along with 450 trees selected for high carbon sequestration. This project has been identified as 1 of 5 test beds in the country by the U.S. Department of Energy and the U.S. Department of Agriculture.

County of Riverside CAP (2019)

The 2019 County of Riverside CAP Update, adopted in 2019, sets 2030 and 2050 GHG reduction targets for unincorporated Riverside County that are consistent with SB 32 and Governor's Executive Order S-3-05, which require statewide reductions of 40 and 80 percent below 1990 emissions levels by 2030 and 2050, respectively. The CAP demonstrates that the County can achieve its state-aligned 2020 and 2050 targets (49 percent below 2008 levels by 2030 and 83 percent below 2008 levels by 2050) through a combination of state and local measures, which are described in detail in Chapters 3 and 4 of the CAP.

In "BAU forecast" the County of Riverside CAP accounts for reductions from the following statewide policies and regulations: AB 1493 (Pavley vehicle standards), Advanced Clean Cars regulation, Low Carbon Fuel Standards, the 2016 Title 24 energy efficiency standards, and a Renewables Portfolio Standard of 60 percent renewables by 2030.

A review of the County of Riverside CAP indicates that nearly all the measures included in that plan are included in the 2022 WRCOG Subregional CAP, with the following exception:

- R2-L2: Light-Reflecting Surfaces for Energy Saving

Table A-7 in Appendix A lists each state and local measure in the County of Riverside CAP and identifies the corresponding WRCOG Subregional CAP measure, where relevant.

SBCOG

SBCOG has an extensive record of promoting and planning for a sustainable future for its members. In 2011, the SBCOG approved the Countywide Vision Statement, which set its member cities and the county on a pathway towards a more sustainable system that complements the natural resources and environment for nine distinct sectors and elements: high-quality education, community health, public safety, housing, retail, recreation, arts and culture, and infrastructure (SBCOG, 2018). In that same year, San Bernardino County also adopted the Emissions Reduction Plan, which outlined a strategy to use energy more efficiently, harness renewable energy to power buildings, enhance access to sustainable transportation models, and recycle waste.

SBCOG's first Regional Greenhouse Gas Reduction Plan, completed in 2014, grew out of those efforts and focused on alignment with the state's Global Warming Solutions Act of 2006 (also known as Assembly Bill [AB] 32), which called for statewide GHG emissions to be reduced to 1990 levels by the year 2020. With the passing of Senate Bill [SB] 32 in 2016, the state updated its emissions target to 40 percent below 1990 levels by the year 2030. This development spurred SBCOG to update its Greenhouse Gas Reduction Plan, an effort that was completed in 2021 (also described in more detail below). Both the 2014 and updated GHG Reduction Plans are certified to be in compliance with the California Environmental Quality Act (CEQA).

The 2014 plan covered 21 jurisdictions in San Bernardino County and the updated plan published in 2021 covered all 24 jurisdictions and Unincorporated San Bernardino County. The updated 2021 Reduction Plan compiled a GHG emissions inventory and an evaluation of reduction measures that could be adopted by the 25 Partnership Jurisdictions of San Bernardino County. The Reduction Plan provides a foundation for cities in the County to develop more detailed community-level climate action plans (CAPs).

Table 2-9 identifies the SBCOG jurisdictions that participated in the 2014 and 2021 GHG Reduction Plan effort. Table 2-9 also identifies the seven SBCOG member jurisdictions that have developed or are in the process of developing a local CAP independent of the subregional efforts. Notably, every jurisdiction in the SBCOG region has engaged in climate action planning at the local or regional scale, or in some cases both.

Table 2-9
Jurisdictions Included in the SBCOG GHG Inventory

Jurisdiction Member	Participated in the 2014 GHG Reduction Plan	Participated in the 2021 GHG Reduction Plan	Independently Developed, or In-Progress CAP
Adelanto	✓	✓	
Apple Valley		✓	✓
Barstow		✓	
Big Bear Lake	✓	✓	
Chino	✓	✓	✓
Chino Hills	✓	✓	
Colton	✓	✓	✓
Fontana	✓	✓	
Grand Terrace	✓	✓	
Hesperia	✓	✓	✓
Highland	✓	✓	
Loma Linda	✓	✓	
Montclair	✓	✓	
Needles	✓	✓	
Ontario	✓	✓	✓
Rancho Cucamonga	✓	✓	
Redlands	✓	✓	✓
Rialto	✓	✓	
San Bernardino	✓	✓	
Twentynine Palms	✓	✓	
Upland		✓	
Victorville	✓	✓	
Yucaipa	✓	✓	✓
Yucca Valley	✓	✓	
Unincorporated San Bernardino County		✓	✓

SBCOG Greenhouse Gas Emissions Inventories

The SBCOG subregional GHG inventory includes the GHG emissions resulting from activities taking place throughout the community by residents, businesses, and local governments. The inventory creates an emissions benchmark so that each jurisdiction can set emission reduction

targets to measure future progress against. It also provides an understanding of where GHG emissions originate and allows a jurisdiction to develop effective policies, strategies, and programs to reduce emissions. The GHG inventory for SBCOG was first conducted in 2014 with a baseline year of 2008, and was updated in 2021 with a baseline year of 2016.

Table 2-10 summarizes the community-wide inventories developed for the SBCOG member jurisdictions, including baseline community inventories for 2008 and 2016. It should be noted that the 2016 inventory includes 4 additional jurisdictions (Apple Valley, Barstow, Victorville and the unincorporated County) that were not included in 2008 inventory and the addition of the additional jurisdiction is the reason the overall inventory increases. As discussed below, most cities saw a reduction in GHG emissions from 2008 to 2016. The boundaries of the inventory are defined as activities associated with specific jurisdictions. Emissions for a particular source were included in a jurisdiction's inventory if either the source of emissions occurs within the geographic boundaries of the jurisdiction, the emissions are associated with land use in the geographic boundary (such as a portion of vehicle emissions that begin or end within the jurisdiction), or if the activity indirectly associated with a source of emissions occurs within the geographic boundaries of the jurisdiction (such as electricity consumption or waste generation). By only including emissions that are controlled by or subject to the influence of the jurisdictions, the inventory forms the basis for local climate action planning.

Table 2-10
SBCOG Subregion – 2008 and 2016 Community GHG Emissions by Sector ($MTCO_2e$)

Sector	2008 Emissions	2016 Emissions	2016 % of Total	2008–2016 % Change
On-Road Transportation	6,119,026	8,223,640	51%	26%
Building Energy[a]	5,470,152	5,649,589	35%	3%
Solid Waste	339,044	1,074,629	7%	217%
Off-Road Equipment	766,722	247,911	2%	-68%
Agriculture	503,246	559,685	4%	11%
Water	240,459	146,750	1%	-39%
Wastewater	70,495	70,039	0%	-0.6%
Total GHG Emissions	**13,543,455**	**15,972,243**	**100%**	**18%**
Stationary Sources[b]	3,944,181	5,595,148		42%

NOTES:

a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. This sector is included as an informational line item and is not accounted for in the inventory totals. Stationary sources include burning fossil fuels on site (other than natural gas). Examples include boilers and industrial equipment.

The 2008 and 2016 inventories are based mostly on actual activity data from the respective years, emission factors from 2008 or 2016, and socioeconomic data (i.e., population, household, and employment) for the subregion. The inventories include all significant contributing sectors to GHG emissions, based on the guidelines of the ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI–Local Governments for Sustainability USA, 2012). The inventory was developed with sufficient detail to support the identification of GHG

reduction measures specific to each jurisdiction's community emissions. For the updated GHG Regional Reduction Plan, SBCOG chose 2016 for the community inventory updates because it was the most recent year with the necessary datasets to perform a comprehensive inventory.

Table 2-10 shows that total emissions, excluding stationary sources, increased by approximately 18 percent from 2008 to 2016. The increase, like nearly all the increases associated with the 2016 inventory, is due to the addition of four jurisdictions in the 2016 inventory that were not included in the 2008 inventory. For both years, the largest emission sources came from on-road transportation (51 percent of total emissions) followed by building energy (35 percent of total emissions). **Figure 2-6** depicts the contribution of various activities to total subregional GHG emissions, excluding stationary sources.

Figure 2-6 2016 Baseline GHG Emissions and 2030 BAU GHG Emissions Forecast for SBCOG's 25 Partnership Jurisdictions by Activity ($MTCO_2e$)

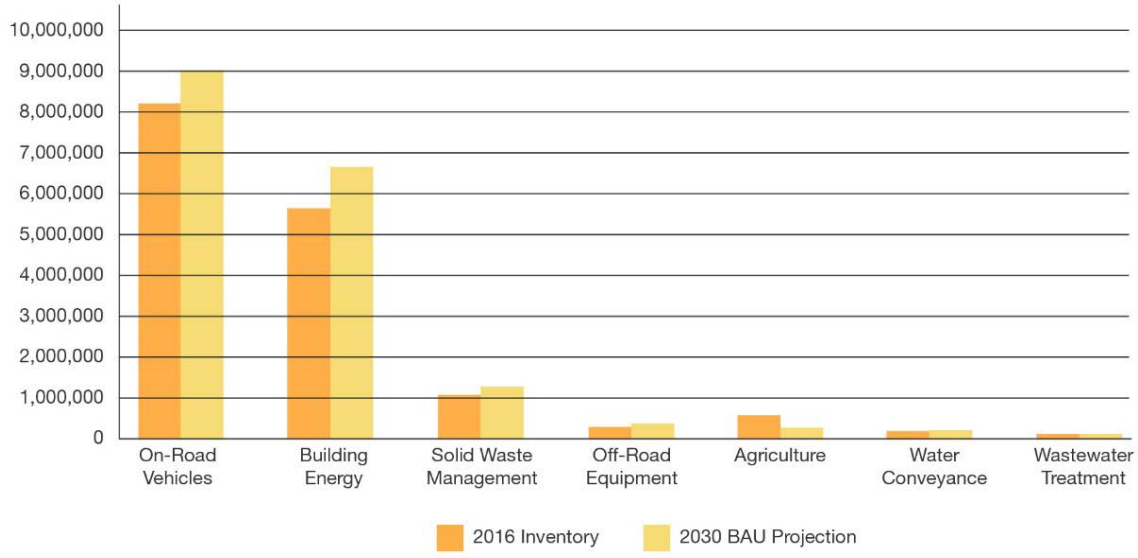
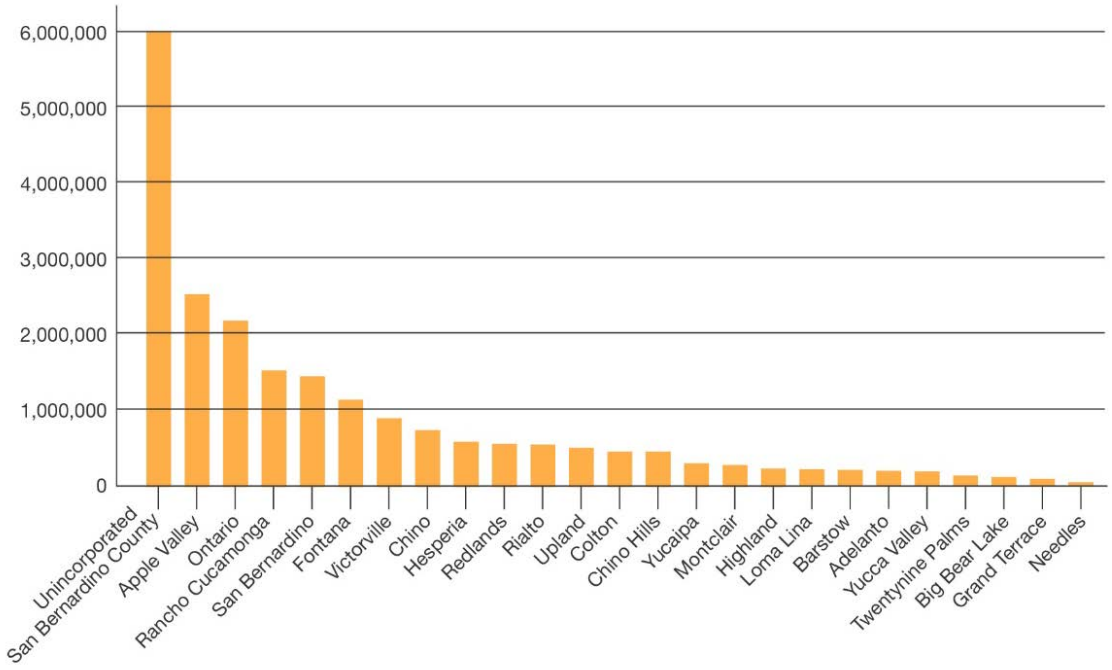


Table 2-10 profiles GHG emissions by sector across the entire subregion, while Table 2-11 details the subregion's emissions by the 25 SBCOG member jurisdictions, excluding stationary sources. It includes the baseline community inventories for the year 2008 and updated community inventories for 2016, as well as the baseline populations for each jurisdiction. **Figure 2-7** depicts the 2016 inventory results graphically by jurisdiction.

SBCOG's subregional inventory is described in detail, including a breakdown of emissions by jurisdiction and by sector, in Appendix A of the 2014 and 2021 San Bernardino County Regional Greenhouse Gas Reduction Plan. The inventory boundaries of analysis, along with the methodology and assumptions used to develop the inventories, are described in Appendix B of the 2014 GHG Reduction Plan and the 2021 Plan Update.

Figure 2-7 **2016 Baseline GHG Emissions for SBCOG's 25 Partnership Jurisdictions by jurisdiction ($MTCO_2e$)**



SBCOG Regional GHG Reduction Plan (2014)

The SBCOG's 2014 Regional GHG Reduction Plan, which included 21 participating jurisdictions as noted in **Table 2-11**, set varied emissions reduction targets at 15 percent below 2008 GHG emissions levels or a range of levels between and 20 percent and 30 percent below 2020 BAU GHG emissions levels, and included a range of state, regional, and local reduction measures for the participants to achieve that target. Nineteen of the cities included in the 2014 plan had reductions in theirs with the exception of two jurisdictions (Hesperia and Yucca Valley, jurisdictions included in the 2014 GHG Reduction Plan had reduced their GHG emissions by 2016 and two had limited increases in GHG emissions.

Table 2-11
Jurisdictions Included in the SBCOG Subregional GHG Inventory

Jurisdiction	Participated in 2014 GHG Reduction Plan?	2008 Baseline Population	2008 Emissions ($MTCO_2e$)	2016 Baseline Population	2016 Emissions ($MTCO_2e$)
Adelanto	Yes	31,200	205,136	33,893	191,431
Apple Valley	No	-	-	74,313	2,482,689
Barstow	No	-	-	24,187	192,539
Big Bear Lake	Yes	5,019	110,158	4,932	105,769
Chino	Yes	75,596	1,239,542	81,294	736,215
Chino Hills	Yes	74,571	489,578	79,737	438,898

Table 2-11
Jurisdictions Included in the SBCOG Subregional GHG Inventory

Jurisdiction	Participated in 2014 GHG Reduction Plan?	2008 Baseline Population	2008 Emissions ($MTCO_2e$)	2016 Baseline Population	2016 Emissions ($MTCO_2e$)
Colton	Yes	52,103	725,435	53,705	448,948
Fontana	Yes	193,913	1,370,848	210,983	1,130,927
Grand Terrace	Yes	11,768	93,423	12,400	78,066
Hesperia	Yes	89,617	537,588	93,687	563,369
Highland	Yes	52,986	282,673	54,201	218,940
Loma Linda	Yes	23,027	285,837	24,474	203,924
Montclair	Yes	35,987	311,049	38,701	254,852
Needles	Yes	4,844	86,150	5,031	31,608
Ontario	Yes	162,871	2,909,011	172,249	2,162,916
Rancho Cucamonga	Yes	162,792	1,721,552	176,503	1,526,628
Redlands	Yes	68,576	785,411	69,531	546,000
Rialto	Yes	98,923	676,731	99,318	508,304
San Bernardino	Yes	203,924	1,910,681	216,326	1,440,525
Twentynine Palms	Yes	24,905	124,220	26,487	125,545
Upland	Yes	-	-	76,403	501,746
Victorville	No	111,872	3,107,387	123,309	889,825
Yucaipa	Yes	51,217	350,462	53,779	280,522
Yucca Valley	Yes	20,652	164,763	21,445	172,732
Unincorporated San Bernardino County	No	-	-	308,079	6,334,474
Total		**1,562,363**	**17,487,636**	**2,134,967**	**21,567,392**

SBCOG Regional GHG Reduction Plan Update (2021)

The 2021 Regional GHG Reduction Plan provides an update of the 2014 effort, and includes all 25 jurisdictions. Using the updated inventory and projections, jurisdictions set updated emissions reduction targets for 2030. The report also includes a set of state and local reduction measures for the participants to achieve that target.

Emissions Inventories and Forecasts

The 2021 Regional GHG Reduction Plan included GHG emissions inventories for the 25 participating jurisdictions for 2016, as well as forecasts for the years 2030 and 2050 under "business-as-usual" (BAU) conditions, representing emissions expected in the absence of state, regional, and local actions taken to reduce emissions over time. BAU emissions forecasts were developed using estimates for population, household, and employment growth within each

participating city. **Table 2-12** is taken from Appendix A of the 2021 Plan and summarizes emissions by sector for the 2016 inventory years and the 2030 and 2050 forecast years. Total Regional Emissions, including stationary sources, in 2016 were 21,567,392 metric tons carbon dioxide equivalent ($MTCO_2e$), approximately 5.0 percent of California's GHG emissions in 2016. For comparison, the County's total population was 5.4 percent of California's population in 2016. In 2016, the top three sources of emissions in the subregion were on-road vehicles (including light/medium and heavy-duty vehicles), building energy use (which includes electricity and natural gas use in residential, commercial, and industrial buildings), and stationary sources (which include burning fossil fuels on site).

Table 2-12
SBCOG Subregion: Summary of Emissions Inventory (2016) and 2030 and 2045 BAU Forecasts

	2016 Inventory		2030 BAU Forecast		2045 BAU Forecast	
Sector	**Emissions**	**Percent**	**Emissions**	**Percent**	**Emissions**	**Percent**
Building Energy	**5,649,589**	**35%**	**6,647,783**	**38%**	**7,664,821**	**39%**
Residential Natural Gas	1,246,579	8%	1,494,075	8%	1,750,408	9%
Commercial/Industrial Natural Gas	965,955	6%	1,143,111	6%	1,323,963	7%
Residential Electricity	1,230,762	8%	1,420,522	8%	1,615,033	8%
Commercial/Industrial Electricity	2,206,297	14%	2,590,075	15%	2,975,418	15%
On-Road Vehicles	**8,223,640**	**51%**	**8,955,209**	**51%**	**9,695,447**	**49%**
Light/Medium-Duty Vehicles	6,108,245	38%	6,473,242	37%	6,882,208	35%
Heavy-Duty Vehicles	2,115,395	13%	2,481,967	14%	2,813,239	14%
Off-Road Equipment	**247,911**	**2%**	**341,637**	**2%**	**503,215**	**3%**
Agricultural	**559,685**	**4%**	**254,938**	**1%**	**113,656**	**1%**
Solid Waste Management	**1,074,629**	**7%**	**1,234,462**	**7%**	**1,402,324**	**7%**
Wastewater Treatment	**70,039**	**0%**	**78,835**	**0%**	**89,874**	**0%**
Water, Transport, Distribution, and Treatment	**146,750**	**1%**	**151,588**	**1%**	**183,023**	**1%**
Total GHG Emissions	***15,972,224***	***100%***	***17,674,452***	***100%***	***19,652,359***	***100%***
Stationary Sources[a]	5,595,148		7,061,714		10,051,098	

NOTE:

This sector is included as an informational line item and is not accounted for in the inventory totals. See Chapter 2 for more information on this sector.

Regional emissions in 2030 are projected to be 24,736,167 $MTCO_2e$, an increase of approximately 15 percent from 2016 levels. In the absence of mitigation measures, the regional allocation of emissions by sector in 2030 will remain largely unchanged from that in 2016. As such, the largest sources of GHG emissions in 2030 in this constant scenario are projected to be stationary sources, building energy, and light/medium-duty vehicles.

Emissions Reduction Targets

The 2021 San Bernardino Regional Greenhouse Gas Reduction Plan provides emissions reductions targets on a per jurisdictional basis for 2030. The baseline level year and emissions reduction percentage vary slightly for each of the 25 jurisdictions. These reduction targets are summarized in **Table 2-13**.

Table 2-13
SBCOG Jurisdictions Baseline Level and Emissions Reductions Targets

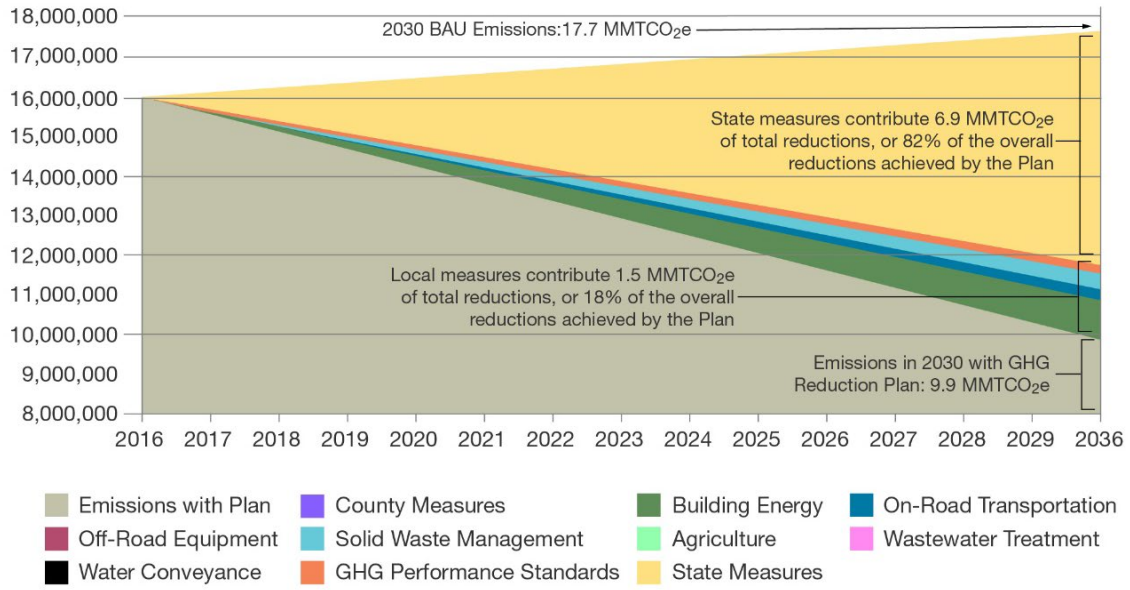
Jurisdiction	Baseline level	Reduction % by 2030
Adelanto	2020 BAU	40%
Apple Valley	2005	40%
Barstow	2020 BAU	40%
Big Bear Lake	2008	32%
Chino	2008	46%
Chino Hills	2008	35.1%
Colton	2008	46%
Fontana	2008	46%
Grand Terrace	2020 BAU	42%
Hesperia	2020 BAU	40%
Highland	2016	40%
Loma Linda	2008	25%
Montclair	2016	42%
Needles	2020 BAU	35.9%
Ontario	2016	40%
Rancho Cucamonga	2016	40%
Redlands	2008	35.1%
Rialto	2016	40%
San Bernardino	2016	40%
Twentynine Palms	2008	46%
Upland	2016	40%
Victorville	2008	40%
Yucaipa	2008	46%
Yucca Valley	2020 BAU	40%
Unincorporated San Bernardino County	2020 BAU	40%

SOURCE: San Bernardino County Greenhouse Gas Reduction Plan (2021)

Overall, the jurisdictions within San Bernardino County are developing reduction targets that align with the state's reduction goal of 40 percent of 1990 emissions levels by 2030 (1990 emissions levels are now approximately equivalent to 2016–2020 emissions levels after successful state reduction efforts).

The San Bernardino County Regional Greenhouse Gas Reduction Plan update in March 2021 also provided a County wide level target of reducing emissions to 40 percent below 2020 Business as Usual (BAU) levels by 2030. This target was created to put the County on a path toward the state's long-term goal to achieve zero net carbon emissions by 2045 (San Bernardino County GHG Reduction Plan 2021). **Figure 2-8** shows the amount of GHG reduction achieved in the subregion within each GHG emission sector (i.e., the sum of all actions taken by all jurisdictions within that sector, including state level programs). Additionally, Figure 2-8 conveys that there is a potential for approximately 8.4 million $MTCO_2e$ in GHG reductions due to the combined effect of state, regional, and local actions detailed in this report.

Figure 2-8 SBCOG Total Identified GHG Reductions in 2030 for the 25 Partnership Jurisdictions ($MTCO_2e$)



GHG Reduction Measures

The 2021 Regional GHG Reduction Plan builds on the foundation of GHG reduction measures that were developed for the first GHG reduction effort by SBCOG in 2014, and includes both state and local strategies. For local strategies, the following major economic sectors are included: energy efficiency, renewable energy, land use, on-road transportation, off-road equipment, solid waste management, agriculture, wastewater treatment and discharge, and new development.

Actions undertaken by the state will contribute to GHG reductions in each Partnership jurisdiction. For example, the state requires electric utility companies to increase their procurement of renewable resources to specified levels by 2030 and 2045. Renewable resources such as wind and solar power produce the same amount of energy as coal and other traditional sources, but do not emit any GHGs. By generating a greater amount of energy through renewable resources, electricity provided to each jurisdiction would be cleaner and less GHG intensive than if the state had not required the renewable standard. Even though state measures do not always require local government action, emissions reductions achieved by this and other state measures

would help lower GHG emissions in each jurisdiction. The 2021 Reduction Plan includes seven statewide initiatives that will contribute to GHG reductions in each jurisdiction. The majority of these programs would improve building energy efficiency and renewable energy generation.

Local measures are those developed or administered at a level of government above the local jurisdiction but below the state. These measures are often more responsive to local context than statewide programs. However, there are measures that are required by state law, such as compliance with Senate Bill 350, or jurisdiction regulations, such as an Idling Ordinance, would be mandatory for either existing and/or new development. Each Partnership jurisdiction would require implementation of these measures, pursuant to state and new or existing local laws and regulations. Measures that would be implemented through incentive-based approaches, such as building retrofits, would be voluntary. GHG reductions associated with these voluntary measures were quantified based on anticipated participation rates. The plan also includes measures that would be implemented by each Partnership jurisdiction for municipal measures. An example of this is establishing a city-wide tree planting goal or tree preservation goal.

Table 2-14 summarizes the relative contributions of state and local measures in reducing GHG emissions by the year 2030, while **Table 2-15** lists each of the state and local measures along with the estimated GHG emissions reduction potential associated with their implementation by 2030.

Table 2-14
SBCOG regional GHG Reduction Plan: 2030 GHG Reductions Achieved through State and Local Measures

Category	2030 Reductions ($MTCO_2e$)	Percent Contribution
State Measures	6,908,565	82%
Local Measures	1,504,397	18%
Total Reductions	**8,412,962**	**100%**

The implementation of state measures is expected to reduce more than 6.9 million metric tons of CO_2e by 2030 across the 25 jurisdictions that form the SBCOG. Jurisdictions implementing the local measures in their communities are expected to further reduce CO_2e by an additional 1.5 million metric tons by 2030. On a city-by-city basis, all participating jurisdictions have committed to enough local action to achieve their city specific GHG reduction targets, as summarized in **Table 2-16** and discussed in additional detail in the individual City summaries provided in the GHG Reduction Plan.

Table 2-15
SBCOG Regional GHG Emissions Reduction Plan: 2030 Reductions for Participating Jurisdictions Achieved through State and Local Measures

State Measures		2030 Reduction Potential ($MTCO_2e$)
State-1	Renewables Portfolio Standard (RPS)	1,741,332
State-2	Title 24 (Energy Efficiency Standards)	812,849

Table 2-15 SBCOG Regional GHG Emissions Reduction Plan: 2030 Reductions for Participating Jurisdictions Achieved through State and Local Measures		
State-3	SB 350	146,388
State-4	Solar Water Heating	1,427
State-5	Co-Generation Facilities	812,849
State-6	Pavley plus LCFS	2,791,668
State-7	AB 32 Methane Capture	602,052
Total State Reductions		**6,908,565**
Local Measures by Sector		**2030 Reduction Potential ($MTCO_2e$)**
Energy		
Energy-1	Energy Efficiency for Existing Buildings	10,032
Energy-2	Outdoor Lighting	82,810
Energy-3	Building Electrification	20,876
Energy-4	Solar Installations for New Commercial/Industrial Development	342,851
Energy-5	On-site Solar Energy for New and Existing Warehouse Space	28,124
Energy-6	Solar Installations for Existing Housing	78,538
Energy-7	Solar Installations for Existing Commercial Buildings	102,296
On Road Transportation		
On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric	3,354
Transporation-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting	73,489
Transporation-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization	28,820
Transportation-4	Expanded Bike Routes	37,397
Transportation-5	Community Fleet Electrification	49,586
Off Road Transportation and Equipment		
Off Road-1	Electric-Powered Construction Equipment	8,512
Off Road-2	Idling Ordinance	4,593
Off Road-3	Electric Landscaping Equipment	7,159
Solid Waste		
Waste-1	Waste Diversion	379,076
Water Conveyance		
Water-1	Require Adoption of the Voluntary CALGREEN Water Efficiency Measures for New Construction	0

Table 2-15 SBCOG Regional GHG Emissions Reduction Plan: 2030 Reductions for Participating Jurisdictions Achieved through State and Local Measures		
Water-2	Require Adoption of the Voluntary CALGREEN Water Efficiency Measures for Existing Buildings	63,912
Water-3	Encourage Water-Efficient Landscaping Practices	9,101
Wastewater Treatment and Discharge		
Wastewater-1	Methane Recovery	1,194
Wastewater-2	Equipment Upgrades	3,149
Agriculture		
Agriculture-1	Methane Capture at Large Daries	0
Land Use and Urban Design		
Land Use-1	Urban Tree Planting	323
Land Use-2	Promote Rooftop Gardens	2
GHG Performance Standard for New Development		
PS-1	GHG Performance Standard for New Development	169,203
Total Local Reductions		**1,504,397**

Table 2-16 SBCOG Regional GHG Reduction Plan: Summary of Planned GHG Emissions Reduction by 2030, by Jurisdiction			
Jurisdiction	**Planned 2030 Emissions ($MTCO_2e$)**	**2030 Emissions Goal**	**Expect 2030 GHG Target to be Met?**
Adelanto	122,867	182,180	Yes
Apple Valley	293,673	321,930	Yes
Barstow	121,395	122,395	Yes
Big Bear Lake	67,308	75,514	Yes
Chino	476,535	537,964	Yes
Chino Hills	279,539	308,290	Yes
Colton	298,474	357,876	Yes
Fontana	651,955	698,844	Yes
Grand Terrace	47,319	47,391	Yes
Hesperia	349,011	363,195	Yes
Highland	141,264	131,364	Yes
Loma Linda	121,570	189,665	Yes
Montclair	143,346	152,911	Yes
Needles	22,761	22,743	Yes
Ontario	1,220,991	1,255,179	Yes

Table 2-16
SBCOG Regional GHG Reduction Plan: Summary of Planned GHG Emissions Reduction by 2030, by Jurisdiction

Jurisdiction	Planned 2030 Emissions ($MTCO_2e$)	2030 Emissions Goal	Expect 2030 GHG Target to be Met?
Rancho Cucamonga	892,711	897,411	Yes
Redlands [a]	4.8	6.0	Yes
Rialto	285,192	304,983	Yes
San Bernardino	817,352	864,315	Yes
Twentynine Palms	78,874	79,123	Yes
Upland	278,541	301,048	Yes
Victorville	567,534	568,498	Yes
Yucaipa	164,285	179,522	Yes
Yucca Valley	94,254	106,543	Yes
Unincorporated San Bernardino County	1,752,437	1,754,098	Yes

NOTE:

a. Redlands has a GHG reduction target for 2030 based on the California Air Resources Board recommended minimum local jurisdiction target, which suggests that local jurisdictions reduce GHG emissions to at least 6.0 $MTCO_2e$ per capita by 2030. Therefore, the emissions targets and goals for Redlands is measured on a per capita basis.

Existing Local CAPs

The SBCOG Regional GHG Reduction Plan provides a foundation upon which each individual jurisdiction may develop its own customized and comprehensive CAP. Many jurisdictions have pursued and developed their own CAPs, some leveraging the regional GHG reductions plans developed by SBCOG. These jurisdictions and their CAPs are summarized below (The City

Town of Apple Valley

The Town of Apple Valley adopted a Climate Action Plan in 2016, which includes a 2005 inventory and baseline and proposed reduction measures that will enable the City to achieve the target of 15 percent below 2005 levels by 2020. The Climate Plan also introduces the statewide reduction target of 40 percent below 2005 levels by 2030. The Apple Valley Climate Plan includes actions such as VMT reduction measures, fuel efficiency measures, mass transit incentives, waste reduction measures, increased solar adoption, and energy efficiency measures (Town of Apple Valley 2016).

City of Chino

The City of Chino adopted a Citywide Climate Action Plan in November 2013 (City of Chino 2013). The CAP identifies strategies to reduce the City's GHG emissions and enhance sustainability. The CAP includes a GHG emissions inventory for the year 2008 and set a target of reducing GHG emissions 15 percent below 2008 levels by 2020. Some primary benefits from the CAP include improving community health and wellness, reducing carbon emissions, protecting

the natural environment, and increasing sustainability of city operations. An updated Climate Action Plan is underway (City of Chino 2013).

City of Colton

The City of Colton adopted a Citywide Climate Action Plan in November 2015 (City of Colton 2015). The CAP was based on the San Bernardino Regional GHG Reduction Plan adopted in 2014. It identifies strategies to reduce the City's GHG emissions including energy efficiency, renewable energy, water conservation, transportation measures, offroad equipment controls, waste diversion, and performance standards for new development. The CAP includes a GHG emissions inventory for the year 2008 and set a target of reducing GHG emissions 15 percent below 2008 levels by 2020. The City is presently updating the CAP based on the San Bernardino Regional GHG Reduction Plan Update in 2021 to extend the CAP to 2030 with a new reduction target.

City of Hesperia

The City of Hesperia adopted the City of Hesperia Climate Action Plan in June of 2010. The Hesperia CAP outlines a course of action for the City government and the community of Hesperia to reduce per capita GHG emissions 29 percent below 2010 levels by 2020 and to adapt to the effects of climate change. The Hesperia CAP includes actions such as reducing emissions from new development through CEQA, increasing bicycle use through a safe and well-connected system of bicycle paths and end of trip facilities, reducing energy use from the transport and treatment of water, and improving the City's recycling and source reduction programs to make continued progress in minimizing waste (City of Hesperia 2010).

City of Ontario

The City of Ontario adopted a Climate Action Plan in 2014, and recently updated it in 2022. In the updated CAP, Ontario set a GHG emissions reduction goal of 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050 (City of Ontario 2022). This goal roughly aligns with the Scoping Plan adopted by the State of California in 2008, recommending the following per-capita targets: reduce 2030 emissions to 6.0 $MTCO_2e$ per capita and reduce 2050 emissions to 2.0 $MTCO_2e$ per capita. The Climate Action Plan identified feasible actions to reduce GHG emissions generated from community actions. The largest reductions from the City's CAP came from the building and renewable energy sector, on-road transportation, and waste (City of Ontario 2022).

City of Rancho Cucamonga

The City of Rancho Cucamonga adopted a Climate Action Plan in 2021, which complements its General Plan and is grounded in the core community values of Health, Equity, and Stewardship (City of Rancho Cucamonga 2021). The CAP includes a GHG inventory, projections through 2040, reduction targets, and measures for achieving those targets. The CAP sets a GHG reduction target for 31 percent below 2018 levels by 2030 and 47 percent below 2018 levels by 2040. The GHG reduction measures in Rancho Cucamonga's CAP predominantly focuses on vehicle travel and building energy use, given that these sectors are the largest sources of emissions in the city.

The CAP also outlines measures related to carbon sequestration, local food supply, water efficiency and management, and waste reduction.

City of Redlands

The City of Redlands adopted a Climate Action Plan in 2017, demonstrating how the city will comply with the State of California's GHG emission reduction standards (City of Redlands 2017). The Climate Action Plan includes a GHG inventory, GHG emissions projections through 2035, monitoring and reporting process to track progress, and options to reduce GHG emissions beyond what is required by the State of California. The plan covers emissions from ten sectors: residential, commercial, industrial, transportation, solid waste, water, wastewater, off-road equipment, public lighting, and agriculture. Based on the Plan's inventory, the sector with the most emissions was transportation, followed by residential and commercial (City of Redlands 2017).

City of Yucaipa

The City of Yucaipa adopted a Climate Action Plan in 2014, with the goal of reducing its community GHG emissions to 15 percent below its 2008 GHG emissions level by 2020 (City of Yucaipa 2014). The City planned to meet this goal through a combination of state (~81 percent) and local (~19 percent) efforts. The selected measures in Yucaipa's Climate Action Plan had the greatest impacts on GHG emissions in the on-road transportation, building energy, and water conveyance sectors (City of Yucaipa 2014).

Unincorporated San Bernardino County

San Bernardino adopted its original GHG Reduction Plan in 2011, with the goal of reducing its community GHG emissions to 15 percent below its 2007 GHG emissions level by 2020 (San Bernardino County 2021). The plan was updated in 2021 with a new emissions target of 40 percent below 2020 BAU levels by 2030. Community GHG reduction strategies include energy efficiency (including for local income homes), solar power, transportation demand management, expanding bicycle routes, idling controls, waste diversion and reduction, water-efficient landscaping, and GHG development standards for new development.

CVAG

The jurisdictions of CVAG have taken ambitious steps to address the impacts of climate change, but CVAG has not collectively taken steps to plan for climate action and set emissions reduction targets on regional basis. CVAG secured Strategic Plan Funding and implemented the “Green for Life” program, which helped seven cities and one tribe to reach ambitious energy savings goals. Through this grant, participants completed GHG inventories, CAPs, Energy Action Plans, and much more; further details on these plans can be found in the sections below. **Table 2-17** identifies the local governments and tribes that have developed a CAP independently of CVAG. Out of the 10 cities, 4 tribes, and Riverside County, 11 CVAG members have developed or are in the process of developing an independent CAP.

Table 2-17
CAP Activity by CVAG Members

Jurisdiction	Independently Developed, or In-Progress CAP
Blythe	✓
Cathedral City	✓
Coachella	✓
Desert Hot Springs	✓
Indian Wells	✓
Indio	✓
La Quinta	✓
Palm Desert	✓
Palm Springs	✓
Rancho Mirage	✓
Agua Caliente Band of Cahuilla Indians	✓
Cabazon Band of Cahuilla Indians	
Torres Martinez Desert Cahuilla Indians	
Twenty-Nine Palms Band of Mission Indians	
Riverside County	✓

Additional previous energy and sustainability efforts undertaken by CVAG include a water efficient landscape ordinance (2009), Urban Greening Guide (2021), and the 2021−2025 Energy Efficiency Business Plan (2021) in partnership with WRCOG and SBCOG. By participating in this Priority Climate Action Plan (PCAP) process for the Inland Empire, CVAG will create its first subregional CAP, and chart a course towards cooperative, region-wide climate action that will contribute to a more vibrant, thriving, and sustainable community.

CVAG Greenhouse Gas Emissions Inventories

CVAG originally developed a subregional community-wide GHG emissions inventory in 2011 with a 2005 base year. A new subregional GHG emissions inventory for CVAG was developed for this PCAP with a 2018 base year (see discussion in Chapter 3). In addition, most of the incorporated cities within the Coachella Valley have published a Climate Action Plan, each inclusive of an accompanying greenhouse gas inventory. **Table 2-18** categorizes these local CAPs by publication year and provides their BAU emissions projections.

Existing Local CAPs

Ten cities in the CVAG subregion have either completed a local CAP, or they are in the process of completing one. Of the ten local CAPs, three have been updated to emissions targets, goals, and projections until 2030. Six CAPs contain targets and projections prior to 2025. Given that the goals and targets of the many CAPs have lapsed, or will soon, the CVAG local CAPs are split between two sections: CAPs with 2030 emissions projections and beyond (Coachella, Indio, and Palm Springs) and CAPs with emissions projections prior to 2030 (Other Jurisdictions).

Table 2-18
Summary of CVAG Local CAPs with Base GHG Inventory Years and BAU Emissions Projections

City	CAP Publication Year	Base Inventory Year	Emissions Projections Year(s)	Projections Business-as-Usual CO_2e
Blythe	2013	2010	2020	2020: 74,061
Cathedral City	2013	2010	2020	2020: 239,333
Coachella	2015	2010	2020, 2035	2020: 923,091 2035: 1,543,672
Desert Hot Spring	2013	2010	2020	2020: 112,816
Indian Wells	2013	2010	2020	2020: 101,399
Indio	2019	2010	2020, 2030, 2040	2020: 528,051 2030: 387,122 2040: 76,959
La Quinta	2013	2005	2020, 2035	2020: 688,627 2035: 828,538
Palm Desert	2015	2013	NQ	NQ
Palm Springs[a]	2021	2010	2020	NQ
Rancho Mirage	2013	2010	2020	2020: 274,333

NOTE:

a. Palm Springs published a full Climate Action Plan in 2013 in which it established 2010 as the base inventory year and created projections for 2020. In 2021, Palm Springs published its Climate Action Roadmap, which is reflected in the table above. It should be noted that in the 2021 Roadmap, Palm Springs updated its 2010 community-wide inventory and assessed 2018 and 2020 emissions, but did not develop emissions projections for 2030 and beyond.

NQ = Not Quantified

Coachella, Indio, and Palm Springs CAPs

City of Coachella CAP (2015)

The Coachella Climate Action Plan (CAP) outlines a comprehensive approach for reducing greenhouse gas emissions in the city. It updates the 2005 greenhouse gas inventory with 2010 data and sets ambitious targets for reducing emissions by 15 percent by 2020 and 49 percent by 2035, based on 2010 levels. The plan includes a detailed analysis of General Plan policies aimed at decreasing energy usage, vehicle travel, and resource consumption. It introduces new measures and an aggressive implementation program, complete with a timeline and cost analysis. **Table 2-19** summarizes the measures in the City of Coachella CAP.

City of Indio CAP (2019)

The Indio Climate Action Plan (CAP) serves as a key strategy for identifying and reducing greenhouse gas emissions in the community and municipal operations. With targets set for 2020, 2030, and 2040, the plan aligns with California state goals. It features an updated emissions inventory for 2010 and lays out strategies and actions for emission reduction. The CAP emphasizes minimizing emissions across households, businesses, and government facilities, showcasing how local and state actions combined can help Indio achieve its emission reduction targets. Table 2-19 summarizes the measures in the City of Indio CAP.

Table 2-19
GHG Reduction Measures for Coachella, Indio, and Palm Springs

Measure	Jurisdiction and Policy
Energy and Building Reduction Measures:	
Alternative Energy Development	Coachella SNE 2.3 Indio 2019 CAP Reductions Palm Springs CAR
Community Choice Aggregation	Coachella SNE 2.4
Energy Efficiency Workshops	Coachella SNE Action 4 Indio Conservation Action 1
Energy Reductions − Cool Paving	Coachella SNE 4.5
Energy Reductions − Shade Trees	Coachella SNE 1.11, 4.6
Energy-Efficient Street Lighting	Coachella SNE 2.9
Open Space for Renewable Energy	Coachella SNE 2.13
Passive Solar Design	Coachella SNE 2.1 and 2.2
Improve Efficiency of Existing Buildings	Coachella SNE 2.7 Indio 2019 CAP Reductions
Energy Performance Targets for New construction	Coachella SNE 2.6
Prohibiting Compromise of Solar Potential	Coachella SNE 2.12
Promoting Renewable Generation	Coachella SNE 2.10
Renewable Energy − Open Spaces	Coachella SNE 2.8
Commercial Energy Conservation Ordinance	Coachella CAP
Residential Energy Efficiency and Conservation Ordinance	Coachella CAP Palm Springs CAR
Residential and Commercial Solar Programs	Indio Conservation Action 1,2
Residential Transfer of Title Energy Disclosure	Conservation Action 2
Commercial Benchmarking	Indio Conservation Action 1
Net Zero Buildings	Indio Conservation Action 7
Municipal Benchmarking	Indio Conservation Action 1
Municipal Facility Upgrades	Indio Conservation Action 1 SNE 2.14 and SNE 4.1
Traffic Signal LED Fixture Upgrades	Indio Existing Policy
Support Deployment of New Technologies	Indio Conservation Action 7
Low Income Weatherization Assistance Program	Indio Conservation Action 3
Promote Smart Growth, TOD, and Complete Neighborhoods	Indio 2019 CAP Reductions
Promote Green Building	Indio 2019 CAP Reductions
Promote Sustainable Cannabis Grow Facilities and Other Large Commercial Buildings	Palm Springs CAR
Incentivize Home Energy Assessments	Palm Springs CAR
Building Electrification	Palm Springs CAR

Table 2-19
GHG Reduction Measures for Coachella, Indio, and Palm Springs

Measure	Jurisdiction and Policy
Water Reduction Measures:	
Conservation Performance Targets for New Construction	Coachella SNE 3.1
Greywater Ordinance	Coachella SNE 3.3 Indio Conservation Action 6
Sustainable Landscape Design and Water Conservation	Coachella SNE 3.7, SNE 13.14 Indio Conservation Action 5 & Existing Policy
Public Education	SNE 3.6
Reclaimed Water Use	IPS 2.17
Recycled Water	Coachella SNE 3.5 Indio Existing Policy
Water Conservation Rate Schedule	Indio Existing Policy
Water Rebate Program	Indio Existing Policy
Water Conservation Ordinance for Existing Homes and Businesses	Coachella CAP
Waste Reductions:	
Construction and Demolition Debris	Coachella IPS 5.13 Indio Infrastructure Action 4
Electronic Waste	Coachella IPS 5.10
Greener Waste Management Practices	Coachella IPS 5.9
Lead by Example − Minimize Solid Waste	Coachella IPS 5.1
On-site Collection and Storage of Recyclables	Coachella IPS 5.15
Public Education	Coachella IPS 5.16
Recyclable Materials − All City Operations	Coachella IPS 5.14
Reduce Use of Toxics	Coachella IPS 5.2
Event Waste Diversion	Indio Infrastructure Action 8
Solid Waste Diversion and Recycling	Coachella IPS 5.3 Indio 2019 CAP Reductions Palm Springs CAR
Zero Waste	Coachella IPS 5.4 Indio Infrastructure Action 4
Green Purchasing	Indio 2019 CAP Reductions
Multifamily Recycling and Composting	Indio Infrastructure Action 4
Food Share Program	Indio Infrastructure Action 7
Transportation (On and Off-Road) Reduction Measures:	
Complete Street and Bicycle Network.	Indio Mobility Action 1,2, 7
Safe Routes to School	Indio Mobility Action 7
Subdivision Ordinance	Indio Mobility Action 3
Bicycle Parking	Indio Mobility Goal 8

Table 2-19
GHG Reduction Measures for Coachella, Indio, and Palm Springs

Measure	Jurisdiction and Policy
Service Network, Promote Mass Transit	Indio Mobility Goal 3 Palm Springs CAR
Commuter Transit	Indio Mobility Goal 3 Coachella LU&T
Employee Carpooling Program	Indio Mobility Goal 7
Managed Parking	Coachella LU&T Indio Mobility Goal 8, Action 6
Prioritize Mixed-Use, Connected Development	Indio Land Use Action 2,4, 6, and 9
Create Infill Housing	Indio Land Use Action 11
Placemaking Program	Indio Land Use Action 7
Low-Carbon Vehicles	Indio Mobility Goal 8 Palm Springs CAR
Golf Cart Routes and Neighborhood Electric Vehicles	Indio Mobility Element
Vehicle Idling	Indio Mobility Action 8
Support Fuel Efficient and Alternative Fuel Vehicles	Indio 2019 CAP Reductions
Improve Pedestrian and Bicycle Infrastructure	Indio 2019 CAP Reductions Palm Springs CAR
Expand Public Transit Options and "Last Mile" Connectivity	Indio 2019 CAP Reductions
Support Transportation Demand Management	Indio 2019 CAP Reductions
Promote Smart Growth, TOD, and Complete Neighborhoods	Indio 2019 CAP Reductions
Transportation Demand Management (TDM)	Coachella CAP
Intelligent Transportation Systems (ITS) / Traffic Flow	Coachella CAP
Implement airport shuttle program, encourage/require low-emitting mass transit options for events, and revisit Buzz Trolley concept	Palm Springs CAR
Electric Lawn Equipment	Palm Springs CAR
Land Use Reduction Measures:	
Urban forest	Coachella SNE 4.6, SNE 1.11
Parks and open space	Coachella SNE 13.2, SNE 13.3, SNE 13.4, SNE 13.5, SNE 13.9, SNE 13.10, SNE 13.12, SNE 13.14, SNE 13.15

City of Palm Springs Climate Action Roadmap (2021)

The City of Palm Springs Climate Action Roadmap (CAR) is intended to serve as a foundation for further discussions among the Commission and the City Council, and as an initial step in developing more detailed climate goals and strategies to include in a future iteration of the City's Sustainability Plan. The CAR compliments the City's existing Sustainability Plan (2016) and updates the Climate Action Plan (issued in 2013). The CAR sets GHG reduction targets for 2020, 2030, and 2050, and is aligned with California's goals. Palm Springs conducted an emissions inventory for 2018 and 2020 estimates and provide a roadmap of future actions to reduce GHG

emissions. The roadmap recommends that Palm Springs focuses on transportation, buildings, and waste to minimize GHG emissions. Table 2-19 summarizes the measures in the City of Palm Springs CAR.

Other CAPs by CVAG Jurisdictions

The 2013 Climate Action Plans (CAPs) of Blythe, Rancho Mirage, Desert Hot Springs, Indian Wells, La Quinta, and Cathedral City, and Palm Desert's updated 2015 Environmental Sustainability Plan, have similar strategies in their approach to reducing greenhouse gas emissions. Most CAPs used 2010 as their baseline year and set their emission reduction goals for 2020, with the exception of La Quinta (which used 2005 as its baseline year and set its emission reductions goals for 2020 and 2035) and Palm Desert (which used 2013 as its baseline and set its emission reduction goals for a 10-year period). A common measure throughout the plans is the adoption of residential and commercial Property Assessed Clean Energy (PACE) programs. These programs provide financing for property owners to make energy efficiency upgrades, and are highly effective in reducing emissions. Additionally, most of these cities prioritized the promotion of electric and hybrid vehicles within their jurisdictions, indicating a strong commitment to transitioning to low-emissions transportation options. This section highlights the shared GHG reduction measures implemented by the cities and provides a breakdown of the sectoral measures and initiatives identified in each jurisdictional CAP.

Blythe

The top five GHG reduction measures in Blythe are focused on renewable energy and sustainable transportation. They include establishing public-private partnerships for solar installations on public land, promoting the installation of 2,000 roof-mounted wind systems on private property, and developing 200 residential "Solar Champion" systems. Additionally, the plan emphasizes promoting electric vehicles through a pilot program and encouraging the purchase of 300 hybrid vehicles in the community, with incentives like recognition and preferential parking.

Sector Breakdown:

- 17 transportation initiatives
- 4 water initiatives
- 3 solid waste initiatives
- 27 buildings and energy initiatives
- 15 government initiatives
- 5 cross-cutting initiatives
- 3 agricultural initiatives

Cathedral City

Key GHG emission reduction strategies in Cathedral City include the Residential PACE program, which aims to reach 25 percent of homes with funding for energy upgrades and renewable energy systems, and the Commercial PACE Program, which promotes energy efficiency and renewable installations in commercial properties. Other significant measures include visitor shuttles to

reduce transportation emissions, public/private partnerships for renewable energy in municipal facilities, and enhanced solid waste diversion to achieve a 65 percent diversion rate annually through 2020.

Sector Breakdown:

- 19 transportation initiatives
- 8 water initiatives
- 5 solid waste initiatives
- 20 buildings and energy initiatives
- 16 government initiatives
- 9 cross-cutting initiatives

Desert Hot Springs

Desert Hot Spring's high impact measures include the Residential and Commercial PACE programs, and strategies to reduce retail leakage to decrease vehicle miles traveled. The plan also focuses on increasing electric vehicle (EV) infrastructure with the installation of 20 EV charging stations, and incentivizing electric vehicles by offering preferential parking. Additionally, visitor shuttles are planned to enhance transportation efficiency, further contributing to the reduction of greenhouse gas emissions.

Sector Breakdown:

- 20 transportation initiatives
- 3 water initiatives
- 3 solid waste initiatives
- 30 buildings and energy initiatives
- 17 government initiatives
- 7 cross-cutting initiatives

Indian Wells

Key initiatives for reducing greenhouse gases in Indian Wells focus on enhancing sustainable transportation options and energy efficiency. The measures include promoting the use of electric vehicles, complete with incentives for users. Additionally, significant efforts are made to facilitate energy upgrades in residential and commercial properties through the PACE programs and on-bill financing options, supporting the transition to energy-efficient and renewable energy solutions.

Sector Breakdown:

- 7 transportation initiatives
- 4 water initiatives
- 2 solid waste initiatives

- 13 buildings and energy initiatives
- 10 government initiatives
- 3 cross-cutting initiatives

La Quinta

La Quinta used 2005 as a base emission year and projected BAU emissions for 2020 and 2035. The most impactful greenhouse gas reduction measures in the CAP include implementing stricter fuel standards for heavy and light-duty trucks and achieving net-zero energy in commercial retrofit developments. Significant traffic flow improvements, such as signal synchronization and promoting mixed-use areas, aim to considerably reduce vehicle miles traveled and therefore GHG emissions associated with transportation. Additionally, expanding solar installations in existing homes forms a key part of the strategy to reduce emissions.

Sector Breakdown:

- 17 transportation initiatives
- 2 water initiatives
- 6 solid waste initiatives
- 20 buildings and energy initiatives

Palm Desert

The City of Palm Desert's Environmental Sustainability Plan addresses six resource areas to address GHG emissions reduction including: built environment, energy management, materials management, regional air quality, transportation, and water management. For the 2015 update, Palm Desert compared its 2013 emissions inventory to its 2008 inventory and found that City emissions had been reduced by 5,284 tons of CO_2e. The plan further prioritized 20 actions based on feasibility; cost; efficiency of leveraging energy, dollar, and carbon savings; level of community support; and carbon reduction potential. These actions include mandatory recycling ordinances, promoting clean air vehicles, and promoting energy efficiency.

Sector Breakdown:

- 20 built environment initiatives
- 26 energy management initiatives
- 18 materials management initiatives
- 10 regional air quality initiatives
- 15 transportation initiatives
- 21 water management initiatives

Rancho Mirage

The top five GHG reduction measures in Rancho Mirage include the Residential PACE Program, which aims to fund energy upgrades in homes, and the Commercial PACE Program for

commercial property upgrades, both yielding significant CO_2 reductions. Other key initiatives include the Save a Ton campaign for residential energy savings, the establishment of an Office of Energy Management to promote community-wide energy efficiency, and an enhanced Solid Waste Diversion program to increase the waste diversion rate.

Sector Breakdown:

- 7 transportation initiatives
- 4 water initiatives
- 2 solid waste initiatives
- 13 buildings and energy initiatives
- 10 government initiatives
- 3 cross-cutting initiatives

CHAPTER 3 – Greenhouse Gas Inventories

The greenhouse gas (GHG) inventories for the member jurisdictions of SBCOG and WRCOG, as presented in Chapter 2, were updated for calendar years 2016 and 2017, respectively, as part of recent subregional climate action planning for those subregions. This chapter presents the results of those inventories along with a new subregional GHG emissions inventory for the CVAG subregion, for the year 2018.

CVAG Subregion

For the purposes of the PCAP, a simplified GHG inventory for calendar year 2018 is summarized below in **Table 3-1** for the CVAG subregion. Total GHG emissions for CVAG member jurisdictions in 2018 are estimated to be 2,694,260 metric tons of CO_2 equivalent ($MTCO_2e$). The total GHG inventory is broken down by economic sector, namely buildings, waste and wastewater, on-road and off-road transportation, water, and agriculture. **Figure 3-1** provides a summary of GHG emissions by sector.

Table 3-1
CVAG – 2018 Community GHG Emissions By Sector ($MTCO_2e$)

Sector	2018 Emissions	2018 % of Total[b]
On-Road Transportation	1,857,237	68%
Building Energy[a]	448,668	18%
Solid Waste	90,372	3%
Off-Road Equipment	105,470	4%
Agriculture	83,966	3%
Water	44,516	2%
Wastewater	24,031	1%
Total GHG Emissions	**2,694,260**	**100%**

NOTES:

a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. Totals may not add up due to rounding.

The on-road transportation sector dominates the emissions landscape, accounting for a significant 68 percent of total GHG emissions, or 1,857,237 $MTCO_2e$. The on-road sector is comprised of GHG emissions from passenger vehicles and trucks. **Figure 3-2** provides a summary of on-road GHG emissions.

Figure 3-1 CVAG GHG Emissions by Sector

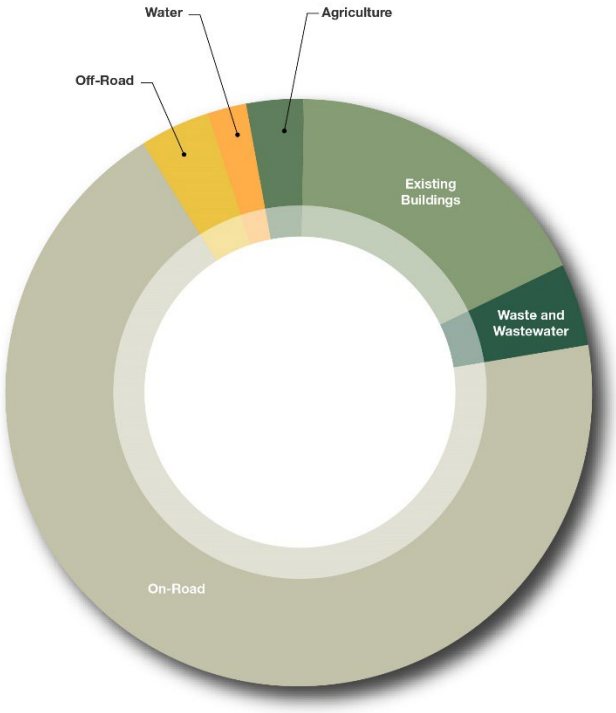
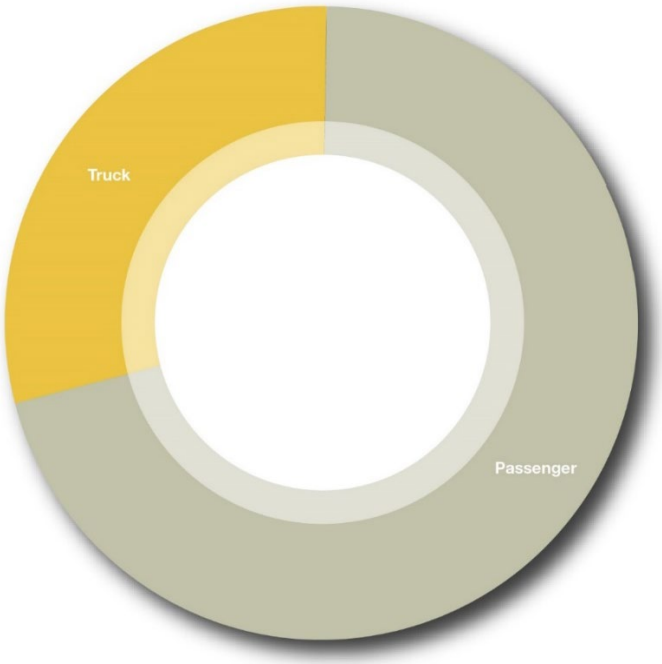
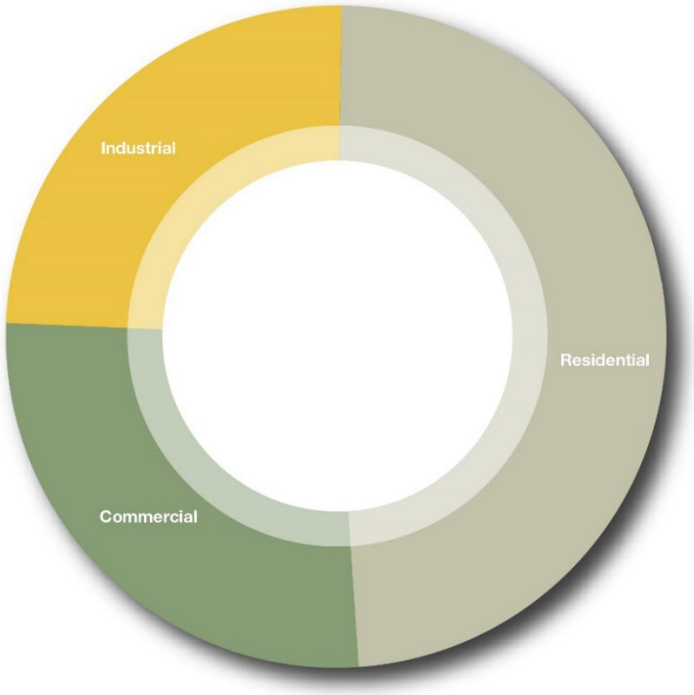


Figure 3-2 CVAG On-road Transportation Sector GHG Emissions



The buildings sector follows as the second-largest contributor, with residential buildings alone responsible for 238,928 $MTCO_2e$. Across the residential, commercial, and industrial subsectors, natural gas emerges as the leading fuel type, contributing nearly 88 percent of the buildings sector's fuel combustion emissions (excluding building electricity emissions). **Figure 3-3** depicts a breakdown of GHG emissions for the building sector.

Figure 3-3 CVAG Building Sector GHG Emissions



The waste and wastewater sector stands as the third-largest source, with a total of 114,403 $MTCO_2e$. Landfills alone contribute 78,168 $MTCO_2e$ to the sector, which is roughly 68 percent of the total for this sector. **Figure 3-4** summarizes GHG emissions for waste and wastewater.

The other sectors, namely offroad, agriculture and forestry, and water, collectively contribute 233,952 $MTCO_2e$ to the subregion's emissions inventory. The offroad sector accounts for 105,470 $MTCO_2e$, largely from diesel engines. The agriculture and forestry sector adds 83,966 $MTCO_2e$, with significant emissions from both enteric fermentation and manure management in cattle. The water sector, despite being the smallest, still contributes 44,516 $MTCO_2e$. Altogether, these three sectors constitute approximately 8.7 percent of the total emissions, underscoring their more modest yet noteworthy role in the overall GHG emissions in Coachella Valley for the year 2018. **Figure 3-5** and **Figure 3-6** depict the GHG emissions by agriculture and offroad sectors.

The methods used for completing the CVAG GHG inventory are consistent with the EPA PCAP guidelines for a simplified GHG inventory. The methods used to complete the CVAG simplified GHG inventory are presented in more detail in *Appendix B – Greenhouse Gas Quantification Methods*.

Figure 3-4 CVAG Waste and Wastewater Sector GHG Emissions

Figure 3-5 CVAG Agriculture Sector GHG Emissions

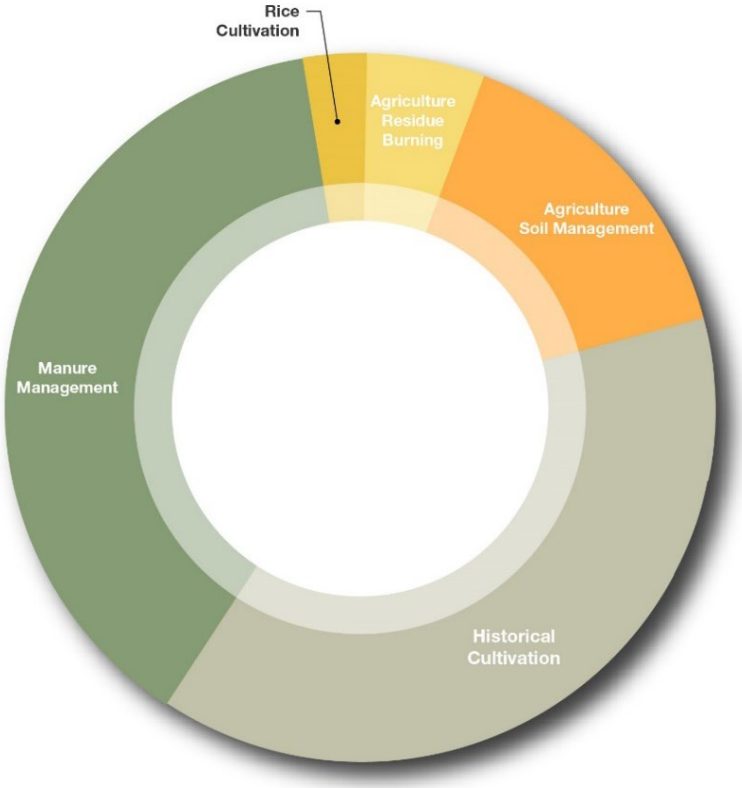
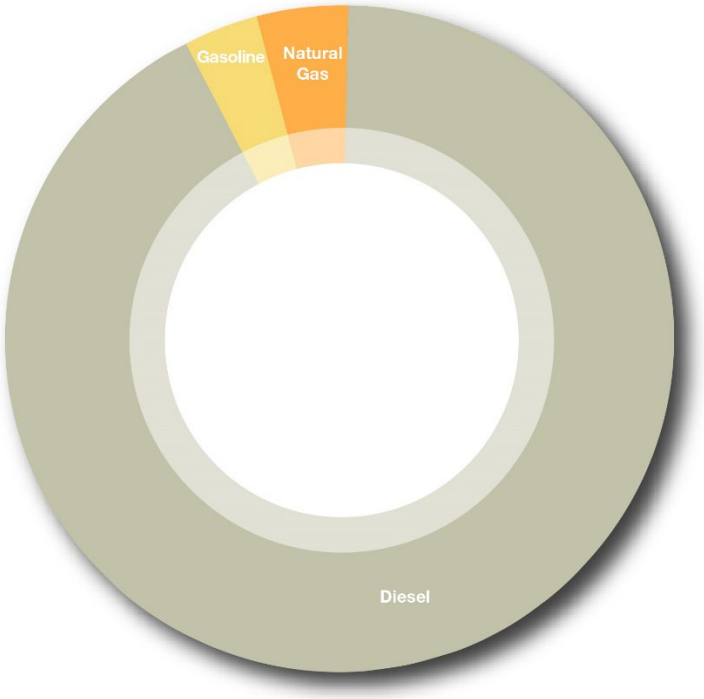


Figure 3-6 CVAG Off-road Sector GHG Emissions



SBCOG

For the purposes of comparing emissions across the subregions, SBCOG's emissions for 2016 are summarized below in **Table 3-2** using consistent aggregations across sectors.

Table 3-2
SBCOG – 2016 Community GHG Emissions By Sector (MTCO2e)

Sector	2016 Emissions	2016 % of Total[b]
On-Road Transportation	8,223,640	51%
Building Energy[a]	5,649,589	35%
Solid Waste	1,074,629	7%
Off-Road Equipment	247,911	2%
Agriculture	559,685	4%
Water	146,750	1%
Wastewater	70,039	0%
Freight Rail	NA	NA
Commuter Rail	NA	NA
Total GHG Emissions	**15,972,243**	**100%**

NOTES:

a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. Totals may not add up due to rounding.

WRCOG

For the purposes of comparing emissions across the subregions, WRCOG's emissions for 2017 are summarized below in **Table 3-3** using consistent aggregations across sectors.

Table 3-3
WRCOG – 2017 Community GHG Emissions By Sector ($MTCO_2e$)

Sector	2017 Emissions	2017 % of Total[b]
On-Road Transportation	4,831,298	44.1%
Building Energy[a]	4,295,955	39.2%
Solid Waste	586,687	5.4%
Off-Road Equipment	532,816	4.9%
Agriculture	251,803	2.3%
Water	162,430	1.5%
Wastewater	79,485	0.7%
Freight Rail	36,036	0.3%
Commuter Rail	13,704	0.1%
Total GHG Emissions	**10,790,213**	**100%**

NOTES:

a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. Totals may not add up due to rounding.

Entire Region (MSA)

The most recent GHG inventories completed for each subregion are summarized below by sector in **Table 3-4** and **Figure 3-7**, along with an estimate of total emissions for the region.[13] The results indicate that on-road transportation contributes the largest share of regional emissions, at 50.8 percent, followed by building energy (consumption of natural gas and electricity) at 35.4 percent, solid waste disposed at landfills at 6.0 percent, mobile offroad equipment and agriculture each at 3.0 percent, water conveyance at 1.2 percent, and wastewater treatment at 0.6 percent..

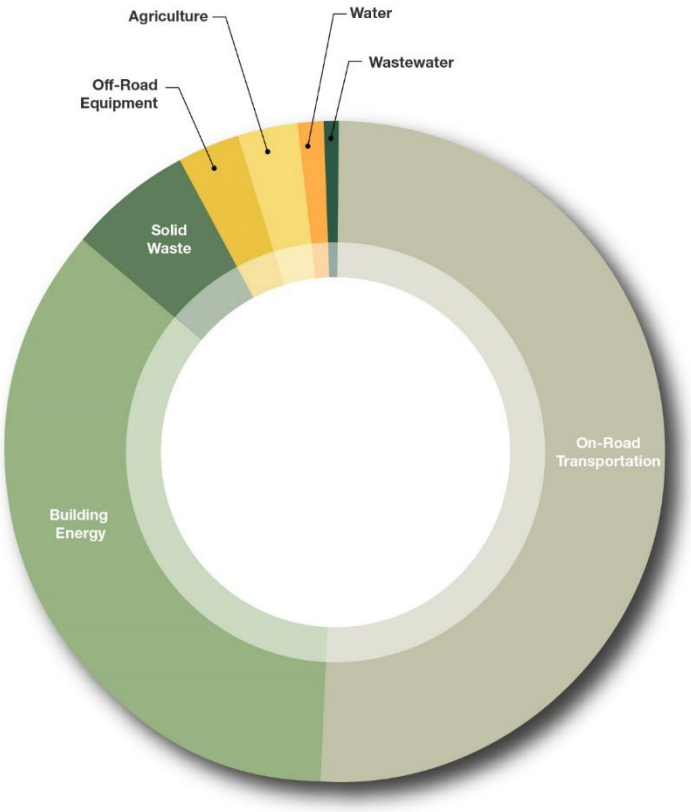
13 For comparison purposes, the inventory summaries in Table 3-4 include the sectors that were included for all three subregions. Although the subregional inventories were completed for different years, the three inventory years occur within a 2-year time span and thus can be considered comparable for regional planning purposes.

Table 3-4
GHG Emissions by Sector ($MTCO_2e$) for Entire Region (MSA)

Sector	CVAG (2018)	SBCOG (2016)	WRCOG (2017)	Regional Total	% of Regional Total[b]
On-Road Transportation	1,857,237	8,223,640	4,831,298	14,912,175	50.8%
Building Energy[a]	448,668	5,649,589	4,295,955	10,394,212	35.4%
Solid Waste	90,372	1,074,629	586,687	1,751,688	6.0%
Off-Road Equipment	105,470	247,911	532,816	886,197	3.0%
Agriculture	83,966	559,685	251,803	895,454	3.0%
Water	44,516	146,750	162,430	353,696	1.2%
Wastewater	24,031	70,039	79,485	173,555	0.6%
Total[b]	**2,654,260**	**15,972,243**	**10,740,474**	**29,366,977**	**100.0%**

NOTES:
a. Includes electricity and natural gas use in residential, commercial, and industrial buildings.
b. Totals may not add up due to rounding.

Figure 3-7 GHG Emissions by Sector (MTCO2e) for Entire Region (MSA)



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CHAPTER 4 – PCAP Measures

This chapter provides a comprehensive summary of GHG reduction measures for the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA), comprised of 54 jurisdictions in San Bernardino and Riverside Counties that are affiliated with the three Councils of Government (COG) known as Coachella Valley Association of Governments (CVAG), San Bernardino Council of Governments (SBCOG), and Western Riverside Council of Governments (WRCOG). The PCAP's GHG reduction measures cover 25 Jurisdictions in San Bernardino County and 29 Jurisdictions in Riverside County. They are organized into two main sections:

- Regional measures that represent the entire MSA including all three COGs, selected because of their broad applicability to the region and their suitability for the CPRG's Implementation Grant application. These are considered the PCAP's priority measures.
- Additional measures that represent the full range of GHG reduction measures in each COG's existing climate action plans (CAPs) that have been adopted or drafted by the COGs themselves (subregional CAPs) and/or by individual jurisdictions (local CAPs).

For details regarding community engagement conducted during the development of the PCAP measures, see **Appendix F**. The engagement process focused on identifying existing strategies and actions that are in advanced stages of development, particularly those strategies that offer significant benefits for LIDACs, either directly or indirectly.

Regional Measures

This section profiles three regional measures, applicable to all three COGs in the MSA, that are considered highest priority for implementation and are anticipated to score well against the evaluation criteria of the EPA's CPRG Implementation Grant program. These three regional measures are described in more detail below:

- Light Duty Electric Vehicle Infrastructure
- Building Decarbonization
- Goods Movement Decarbonization

Methods for Selecting and Evaluating Regional Measures

The three regional measures included herein are the product of extensive coordination and engagement between multiple stakeholders, including CVAG, SBCOG, WRCOG, city and county local government, South Coast Air Quality Management District (SCAQMD), Southern California Association of Governments (SCAG), and the Inland Regional Energy Network (I-REN). The following key considerations were used in evaluating and selecting the three regional measures for inclusion in the PCAP:

- Community and Stakeholder support.
- Magnitude of anticipated GHG Reductions ($MTCO_2e$) from 2025 through 2030 (near-term), and 2025 through 2050 (long-term).

- Transformative impact – i.e., extent to which the measure has the potential to create transformative opportunities or impacts that can lead to significant additional GHG emissions reductions.
- Demonstration of funding need.
- Cost-effectiveness of GHG reductions.
- Potential for co-benefits to low income and disadvantaged communities (LIDACs), including reductions in air pollutants, reductions in risk from climate impacts (e.g., extreme heat events), and equitable outcomes in terms of economic growth and improved quality of life.
- Anticipated workforce implications and quality of local job creation.
- Potential for near-term implementation (i.e., "implementation ready").

Methods used to estimate the GHG reductions from regional measures are described in *Appendix B – Greenhouse Gas Quantification Methods*.

Light Duty Electric Vehicle Infrastructure

Background

In California, the transportation sector accounts for about 50 percent of the state's GHG emissions, 80 percent of its NOx emissions, and 90 percent of its diesel particulate emissions.[14] These numbers highlight the potential positive impacts of transitioning to zero-emission transportation fuels, especially in geographic areas that experience high levels of medium- and heavy-duty traffic.

Zero-emission vehicle (ZEV) deployment in California continues to grow rapidly, fueled by federal and state policy, air quality improvement and GHG and petroleum use reduction goals, consumer behavior, and other important market forces. The state of California has set ambitious goals for ZEV adoption for both public and private fleets, and charging and fueling infrastructure plays a critical role in supporting vehicle adoption. A critical component to meeting these goals is rapid expansion of publicly accessible electric vehicle charging stations (EVCS). If state goals are to be met, many zero-emission vehicles will need to be deployed over a very short period.

Currently, there are Federal and state programs that provide funding for installation of EVCS, but it is not nearly enough to fund the infrastructure to meet state and regional goals for ZEV adoption.

In addition, there are unique factors in the region that require further support to deploy ZEVs. Specifically:

- On-road transportation GHG emissions in Coachella Valley comprise nearly 70 percent of the subregion's total GHG inventory, which is significantly higher than the statewide transportation average of 50 percent of total emissions.

14 California Energy Commission. https://www.energy.ca.gov/about/core-responsibility-fact-sheets/transforming-transportation

- Absent any further interventions, on-road transportation GHG emissions in Western Riverside are expected to increase by nearly 29 percent and 75 percent by 2030 and 2050, respectively. Note: WRCOG forecasted transportation emissions take into account changes in VMT-related emissions in absence of state, regional and local actions.

- Absent any further interventions, on road transportation GHG emissions in San Bernardino County are expected to increase by approximately 9 percent by 2030 and 18% by 2045. (Note: SBCOG forecasted transportation emissions take into account changes in VMT and forecasted change in vehicle emissions with adopted state regulation, but do not include regional and local actions).

This regional measure builds from several measures in WRCOG's Subregional CAP (2022) and SBCOG's Regional GHG Reduction Plan (2021):

- WRCOG Measure RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives
- WRCOG Measure LT-10: Local ZEV Programs: Infrastructure Expansion and Vehicle Purchases
- SBCOG Measure N-5: Community Fleet Electrification

By incentivizing the transition to EVs through an expanded EV charging infrastructure, the Riverside and San Bernardino County region can reduce GHG emissions and air pollution associated with passenger vehicles. This regional measure has the capability to significantly reduce emissions from light duty vehicles, as well as provide additional environmental and social benefits.

Description of Regional Measure

Goal & Purpose

The expansion of light duty EV infrastructure in the region has the potential to significantly reduce GHG emissions from on-road transportation, the largest contributing sector across all three subregions. The goal of this measure is to achieve significant decarbonization of on-road transportation vehicles while ensuring that low income and disadvantaged communities (LIDACs) have equitable access to the network of additional EVCS resulting from the measure. This regional measure addresses the need for large-scale deployment of EVCS in Riverside and San Bernardino Counties, particularly in areas populated by LIDACs, where investment in EV infrastructure has historically been limited. Funding to implement this measure will support the deployment and operation of an increasing number of light-duty EVs traveling within and through the region by providing accessible, reliable, and widely available charging opportunities.

Scope of Potential Activities Under This Measure

- Program planning and siting of EVCS
  - Identify appropriate locations and site hosts.[15]
  - Outreach and engagement to ensure that sites are appropriate and effective.
  - Coordinate with local and regional planning efforts related to ZEV infrastructure.
  - Leverage, where possible, EV readiness planning that has been previously completed for the region by CVAG, SCAG, and WRCOG.
- EVCS Purchases
  - DC fast chargers along highway corridors to support regional travelers.
  - Level 2 chargers to support community, multi-family residential, and local opportunity charging.
- EVCS Deployment
  - Install EVCS: design, construction, construction management.
  - Provide needed electrical infrastructure upgrades.
- EVCS Operation
  - Support station operations and payments.
  - Ensure that stations are functional.
  - Provide customer service to end users.
  - Periodic charger software upgrades.
- EVCS Maintenance
  - Ensure stations are maintained and repaired promptly.
  - Ensure correct connector standards are maintained.
  - Ensure technicians are trained in appropriate technologies and needed skills.
- Program Administration

Participants (Implementing Parties)

This program will require a diverse set of participants and stakeholders to be successful. To ensure that it is run efficiently and effectively, it will be important to establish a central authority (Program Lead) that is responsible for the coordination of all program aspects.

The following are anticipated program participant roles:

- SBCOG, WRCOG, CVAG, and their member agencies
- Western Riverside County Clean Cities Coalition

15 A successful program will depend on strong relationships with willing site hosts. This is important for finding high-quality sites for publicly accessible chargers and for maintaining program funding and resources. Site hosts can include municipalities, community centers, shopping centers, employment centers, multi-family residential developments, recreation centers, attractions, and places of interest.

- Southern California Clean Cities Coalition (includes San Bernardino County)
- Charging Network Provider
- Charging Equipment Provider
- Installation and Maintenance provider(s)
- Training Provider
- Utility Partners
- Site Hosts

Stakeholder and Site Host Considerations

The success of this program will depend on strong relationships with willing site hosts. This is important for finding high-quality sites for chargers and for maintaining program funding and resources. Site hosts can include municipalities, community centers, shopping centers, employment centers, multi-family residential developments, recreation centers, attractions, and places of interest.

Extensive outreach and engagement will be conducted throughout the project to ensure that sites are appropriate and effective.

Authority to Implement

Authority to implement this regional measure lies with WRCOG, SBCOG, and CVAG, whose governing power comes from California Government Code, particularly Title 5, Division 1, Chapter 6, Section 6500 et seq. Additional regulatory and/or statutory authorities that may be needed to implement this measure are described, by agency, in Appendix C.

The I-REN and Clean Cities Coalition are potential program administration and implementation partners for this regional measure. Although the installation of EV charging stations typically requires a permit from the local jurisdiction, extensive environmental review (e.g., review under CEQA or NEPA) is not required. Implementation of this regional measure can leverage regional EV readiness planning previously completed by CVAG (Coachella Valley Plug-In Electric Vehicle Readiness Plan)[16], SCAG (Southern California Plug-in Electric Vehicle Readiness Plan)[17], SBCOG (Zero-Emission Vehicle Readiness and Implementation Plan)[18], and WRCOG (Western Riverside County Plug-in Electric Vehicle Deployment Plan)[19], as well as plans completed by local jurisdictions (e.g., cities of Riverside and Rancho Cucamonga).

16 ICF, 2014, Coachella Valley Plug-In Electric Vehicle Readiness Plan. Available at: https://www.cvag.org/library/pdf_files/trans/CVAG_PEV_Readiness_Plan%20(FINAL%20print).pdf

17 SCAG, 2021, Southern California Plug-in Electric Vehicle Readiness Plan. Available at: https://www.energy.ca.gov/sites/default/files/2021-04/CEC-600-2021-018.pdf

18 Center for Sustainable Energy, 2019, San Bernardino County Zero-Emission Vehicle Readiness and Implementation Plan. Available at: https://www.gosbcta.com/plan/zero-emission-vehicle-readiness-and-implementation-plan/

19 UCLA Luskin Center for Innovation, 2013, Western Riverside County Plug-in Electric Vehicle Deployment Plan. Available at: https://scag.ca.gov/sites/main/files/file-attachments/scag_ucla_luskin-

Geographic Coverage

This measure is applicable to the entire Inland Empire region, inclusive of all jurisdictions belonging to WRCOG, SBCOG, and CVAG.

GHG Reduction and Cost Metrics

This analysis represents a business-as-usual (BAU) scenario in which the regulations in place at the time of analysis are assumed to be carried forward for future years. In other words, the analysis does not account for planned state regulations (e.g. Renewables Portfolio Standard and Pavley Vehicle Standards) that would increase the efficiency of on-road vehicles and decarbonize the electricity grid by the year 2030. For planning purposes, GHG reduction and cost estimates can be based on the following per-unit values in year 2030:[20]

- Level 2 EVCS, upfront capital costs and costs per year of full operation:
  - 2.2 $MTCO_2e$ reduction
  - $25,000 capital cost per charger (equipment and infrastructure costs)
  - $720 maintenance cost per charger
  - $300 network cost per charger
- DCFC EVCS, upfront capital costs and costs per year of full operation
  - 108.9 $MTCO_2e$ reduction
  - $130,000 capital cost per charger (equipment and infrastructure costs)
  - $1,400 maintenance cost per charger
  - $300 network cost per charger

These metrics were calculated using a combination of the following resources and assumptions:

- Charging utilization assumptions (e.g. charging sessions per day, kWh per session, hours per charger per day) were developed using data from Electrify America's Quarterly Reports submitted to CARB.[21]
- EMFAC2021 is an on-road emissions model that provides emissions data for criteria pollutants and GHGs. EMFAC2021 was used to derive the average emissions rate (in grams per mile) of CO_2e for a gasoline light-duty vehicle operating in San Bernardino and Riverside Counties in year 2023.
- Emissions from electricity usage by EV chargers were estimated by forecasting emission factors for year 2025 from EPA's eGRID tool, which provides grid average regional emission factors through 2022.[22]

20 Estimates includes costs from equipment and infrastructure, electricity usage, maintenance, operations, and network.

21 Electrify America, 2023. Quarterly Reports. Available at: https://ww2.arb.ca.gov/resources/documents/electrify-america-reports.

22 USEPA, 2023. Emissions & Generation Resource Integrated Database (eGRID). Available at: https://www.epa.gov/egrid.

EV chargers are assumed to displace VMT associated with ICE vehicles. The difference in emissions from displaced ICE vehicle VMT and electricity emissions generated by chargers equals the total net emissions reduction.

Alternatively, GHG reductions are assessed assuming full implementation of existing state regulations, namely the state's Renewables Portfolios Standard (RPS) and numerous vehicle efficiency standards built into EMFAC2021. Incorporating the impacts of these regulations, the EVCS would have the following per unit emissions reductions and associated costs in year 2030:

- Level 2 EVCS, upfront capital costs and costs per year of full operation:
  - 2.0 $MTCO_2e$ reduction
  - $25,000 capital cost per charger (equipment and infrastructure costs)
  - $720 maintenance cost per charger
  - $300 network cost per charger
- DCFC EVCS, upfront capital costs and costs per year of full operation
  - 98.6 $MTCO_2e$ reduction
  - $130,000 capital cost per charger (equipment and infrastructure costs)
  - $1,400 maintenance cost per charger
  - $300 network cost per charger

The state regulation scenario uses the same set of assumptions as mentioned above with the exception of the on-road and electricity emission factors, which are adjusted to account for more efficient light-duty vehicles and a cleaner electricity mix based on CARB's EMFAC2021 model and the State of California RPS projections for 2030.

Other Metrics for Tracking Progress

- EVCS sites identified
- ECVS sites permitted
- Number of Level 2 EVCS installed; fully operational
- Number of DCFC EVCS installed; fully operational

Example Project for Implementation

To illustrate the costs and GHG reductions that could be expected by implementing this measure at a scale that aligns with available funding from EPA's CPRG Implementation Grant program, a hypothetical $40 million capital cost project could result in the installation of 510 EVCS throughout the target area, assuming an even split between Level 2 and DCFCs (see **Table 4-1**). The actual split between Level 2 and DCFCs in implementation would be different; this is just an example.

Table 4-1 Charger Deployment		
Charging Level	**Total Deployed**	**Example Locations**
240 Volt Level II	255	Community facilities, shopping centers, multi-family units, and workplaces.
DC Fast Chargers	255	Highway Corridors, rest stops, industrial centers, warehouses, and regional places of interest.

Estimated Capital and Operational Costs

Table 4-2 through **Table 4-5** provide an overview of estimated costs associated with purchasing and installing EVCS for the example project, as well as the annual cost to operate and maintain them. The cost estimates are based on data was provided by an EV charger supply company working with SBCOG, using the set of assumptions mentioned above. Calculations are based on deploying 255 240v level 2 EVCS and 255 DC fast chargers (DCFC).

Table 4-2 Estimated Total EVCS Equipment and Infrastructure Cost			
Charging Level	**Hardware Cost**	**Installation Cost**	**Total Capital Cost**
240v Level 2	$3,525,000	$2,550,000	$6,375,000
DC Fast Charge	$14,025,000	$19,125,000	$33,150,000
Total EVCS Cost			**$39,525,000**

Table 4-3 Estimated Total Annual Energy Cost			
Cost Type	**Level 2**	**DCFC**	**Total Annual Energy Cost**
Electricity energy charge	$150,255	$7,592,440	$7,742,695
Electricity demand charge	$321,300	$6,885,000	$7,206,300
Electricity fixed charge	$110,925	$28,560	$139,485
Total Annual Energy Cost	**$582,480**	**$14,506,000**	**$15,088,480**

Table 4-4 Estimated Annual Maintenance Cost		
Level 2	**DCFC**	**Total Annual Maintenance Cost**
$183,600	$357,000	$540,600

Table 4-5 Estimated Annual Network Costs		
Level 2	**DCFC**	**Total Annual Network Cost**
$76,500	$76,500	$153,000

Implementing Schedule and Milestones

The assumed project implementation schedule includes several milestones representing a phased installation of EVCS over an approximate three-year period starting late 2024 following the award of funding, with the goal of complete deployment by December 31, 2027.

- Nov 2024 – April 2025: Program planning and siting of publicly accessible EVCS; Coordination with local and regional ZEV planning efforts; coordination with local governments and landowners to identify eligible sites for EVCS installation; optimize EVCS siting for public access and LIDAC benefits.
- May 2025 – July 2025: Permitting of EVCS; Begin contracting for EVCS purchases.
- Aug 2025 – December 2025: Phase 1 Electrical Upgrades and EVCS installation (20 percent installation)
- 2026: Phase 2 Permitting, Electrical Upgrades and EVCS installation (60 percent installation)
- 2027: Phase 3 Permitting, Electrical Upgrades and EVCS installation (100 percent installation)
- Ongoing (starting Aug 2025): EVCS Maintenance & Program Administration & Evaluation

This schedule is consistent with many state and federal ZEV deployment goals and will contribute to the successful proliferation and operation of these vehicles. The program will also focus on operations and maintenance beyond that time and will continually evaluate the feasibility of expansion as resources and needs arise.

Potential Revenues

There are multiple ways for EVCSs to bring revenue that supports the program.

Low Carbon Fuel Standard (LCFS) Credits

The LCFS allows participants who own EV charging stations to generate credits every quarter in proportion to the amount of electricity dispensed to fuel EVs. These LCFS credits can then be sold on a credit market to parties that need them for compliance with the regulation (e.g., refiners that produce petroleum fuels). The amount of potential LCFS credit revenue generated is primarily dependent on how much energy is used at the charging station and the price for LCFS credits. **Table 4-6** provides a range of potential revenue estimates across various station utilization rates and credit prices for a single station in 2021.

Estimates for this project are displayed in the **Table 4-7**. Assumptions are made based on 3,274 kWh/year/charger for 240v level 2, and 165,413 kWh/charger/year for DCFC chargers. This is an estimate and will change with actual charger utilization.

Table 4-6
Potential Annual LCFS Credit Revenue per Charging Station (2021)

Electricity Dispensed	Daily Average Charging Equivalent[a]	LCFS Credit Price[b]		
		$150/credit	$175/credit	$200/credit
2,000 kWh	1.2 hours of charging per weekday	$249	$291	$333
4,000 kWh	2.3 hours of charging per weekday	$499	$582	$665
6,000 kWh	3.5 hours of charging per weekday	$748	$873	$998

NOTES:

a. Assumes the charging speed of a standard Level 2 charger of 636 kilowatts. For more information on Level 2 charging, visit https://calevip.org/electric-vehicle-charging-101.
b. LCFS credit prices are market driven and past performance is not an indicator of future credit prices.

Table 4-7
Estimated Annual LCFS Revenue [a]

Charger Type	kWh Per Charger [b]	# of Chargers	$60/credit	$125/credit	$200/credit
240v Level 2	3,274	255	$41,738	$86,953	$139,125
DCFC	165,413	255	$2,109,011	$4,393,773	$7,030,037
Total			**$2,150,749**	**$4,480,726**	**$7,169,162**

NOTES:

a. A range is provided for this revenue as credit prices (and the resulting revenues) fluctuate regularly. The current market price is $61, therefore $60 was used as the low end of the range. CARB forecasts prices may rise to their cap at just over $200/credit later this decade, however we are providing the lower price as a conservative estimate. Higher credit prices would translate to greater fuel cost savings and vice versa.
b. kWh per charger is estimated. Actual numbers will be dependent upon the utilization of the charger.

Charging Fee Revenue

Potential revenues from charges to the end users are outlined in **Table 4-8**.

Table 4-8
Estimated Annual Charging Fee Revenue

Charger Type	Cost/kWh	# kWh	Total
240v Level 2	$0.30	834,753	$250,426
DCFC	$0.40	42,180,221	$16,872,089

Estimated Emissions Reduction Estimates

Estimated annual emissions and petroleum use reductions are presented in **Table 4-9** and **Table 4-10** for a BAU scenario where the carbon content of grid electricity remains the same as current conditions, and a state renewables portfolio (RPS) scenario where California's target of 60 percent renewables for the grid by 2030 is assumed to be met. GHG emissions represent net total emissions. Air pollutant emissions (CO, NOx, PM10, PM2.5, VOC, and SOx) were

estimated using CARB's EMFAC2021 Tool.[23] Note that air pollutants were assumed to remain the same between the two scenarios.

Table 4-9
Estimated Reductions in Annual Emissions and Fuel Use – 2030 BAU

Charger Type	Petroleum Savings (barrels)	GHGs (Metric Tons)	NOx (lb)	CO (lb)	PM10 (lb)	PM2.5 (lb)	VOC (lb)	SOx (lb)
Level 2	1,450	537	286	4,065	6.0	5.6	70.0	14.4
DC Fast Charging	73,259	27,113	14,454	205,423	305.6	281.4	3,538.1	726.1
Total	**74,708**	**27,649**	**14,740**	**209,488**	**311.7**	**287.0**	**3,608.2**	**740.4**

Table 4-10
Estimated Reductions in Annual Emissions and Fuel Use – 2030 RPS Scenario

Charger Type	Petroleum Savings (barrels)	GHGs (Metric Tons)	NOx (lb)	CO (lb)	PM10 (lb)	PM2.5 (lb)	VOC (lb)	SOx (lb)
Level 2	1,344	497	182	3,153	4.5	4.1	46.8	12.8
DC Fast Charging	67,902	25,130	9,191	159,322	226.6	208.5	2,362.7	645.6
Total	**69,246**	**25,628**	**9,373**	**162,475**	**231.0**	**212.6**	**2,409.5**	**658.4**

Cost-Benefit Determination

BAU Scenario

Assume full implementation in year 1 (2025)

One Time Capital Cost = $39,525,000

Annual Energy Costs = $15,088,480

Annual Operating and Network Costs (Maintenance) = $693,600

Annual Energy + Operating Cost = $15,752,080

Total annual revenue = LCFS + charging fees = $2,109,011 + $16,872,089 = $19,273,263

Cost per metric ton GHG reduced (present day $):

- **5 years operation** (2025−2029): $39,525,000 + (5 x $15,752,080)/(5 x 27,649 MT) = $118,435,402/138,247 MT = **$857 per metric ton**

[23] CARB, EMFAC2021. Available at: https://arb.ca.gov/emfac/emissions-inventory

- **25 years operation** (2025−2049): ($39,525,000 + (25 x $15,752,080)/(25 x 27,649 MT) = $434,077,099/691,235 MT = **$628 per metric ton**

State Regulations Scenario

Assume full implementation in year 1 (2025)

One Time Capital Cost = $39,525,000

Annual Energy Costs = $15,088,480

Annual Operating and Network Costs (Maintenance) = $693,600

Annual Energy + Operating Cost = $15,752,080

Total annual revenue = LCFS + charging fees = $2,109,011 + $16,872,089 = $19,273,263

Cost per metric ton GHG reduced (present day $):

- **5 years operation** (2025−2029): $39,525,000 + (5 x $15,752,080)/(27,649 + 27,087 + 26,634 + 26,228 + 25,894 MT) = $118,435,402/133,492 = **$887 per metric ton**
- **25 years operation** (2025−2049): ($39,525,000 + (25 x $15,752,080)/(673,126 [sum of 2025−2049 emissions reductions] MT) = $434,077,099/673,126 = **$645 per metric ton**

Summary of Implementation Grant Suitability

High GHG Reduction Potential

This measure addresses the region's largest GHG emissions sector. As such the GHG reduction potential for the measure is high:

- WRCOG: Light/Medium-Duty Vehicles were 37 percent of total subregional GHG emissions in 2017 and are projected to be 50 percent of emissions in the region's 2045 business-as-usual forecast.
- SBCOG: Light/Medium-Duty Vehicles were 38 percent of total subregional GHG emissions in 2016 and are projected to be 35 percent of emissions in the region's 2045 business-as-usual forecast.
- CVAG: Light Duty Vehicles were 45 percent of total subregional GHG emissions in 2005; On-road transportation represents 69 percent of total subregional emissions in 2018,

Transformative

This supports a key State of California priority in CARB's latest Scoping Plan Update (2022), which identifies transportation electrification as one of the top three priorities for local climate action plans, recognizing on-road transportation as the largest contributing sector to statewide GHG emissions.[24]

[24] California Air Resources Board. 2022. *2022 Scoping Plan For Achieving Carbon Neutrality.* November 16, 2022. Available: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. At page 184.

Workforce Implications

The Light Duty EV Infrastructure measure has numerous implications on workforce planning and development. Implementation of the measure will require labor to install, operate, and maintain EV charging stations, and to complete electrical upgrades that are needed to support the charging stations. These activities can translate into good paying local-jobs and may require appropriate workforce training programs. A detailed workforce planning analysis is included in *Appendix E: Workforce Analysis Methods*.

Regional Support

There is widespread regional political support for expanding publicly accessible EV charging infrastructure, as reported by stakeholders and as evidenced by strategies and measures described in existing local and regional CAPs.

LIDAC Benefits

Expansion of EV infrastructure will help support a faster transition to zero emission vehicles and yield significant GHG reductions locally and regionally. This transition will provide direct co-benefits for improved air quality and public health. Additional indirect benefits encompass lower healthcare costs related to hospital visits for respiratory and cardiovascular conditions, which are frequently exacerbated in populations residing closer to major corridors, as well as decreased noise pollution attributed to ZEVs. This is particularly important for dense, residential clusters located near major roadways and goods movement corridors, where many LIDACs reside. Publicly available EV infrastructure also expands options for personal vehicle ownership. A detailed analysis of the region's LIDACs, their climate change vulnerabilities, and the co-benefits expected from implementation of this regional measure is included in *Chapter 5: LIDAC and Co-benefits Analysis*.

Need For Funding

Despite there being existing funding sources for expanding EV charging infrastructure (see detailed discussion of available funding programs in the next section), there is not nearly enough funding available for the region to provide enough EVCSs to meet anticipated need. California's first Mobile Source Strategy (2016) called for 5 million ZEVs to be operational statewide by 2030 for the state to meet its GHG reduction goals. In support of this ZEV target, California Governor's Executive Order B-48-18 set a goal of having 250,000 chargers (including 10,000 direct current fast chargers) by 2025. The Mobile Source Strategy was updated in 2020 to include strategy updates related to new EV regulations such as Governor Newsom's Executive Order N-79-20 requiring 100 percent of new passenger vehicles to be ZEVs by 2035.

Since then, CARB has established pathways to achieve the goals of Executive Order N-79-20, including the 2022 adoption of Advanced Clean Cars II (ACCII) that requires an increasing annual percent of new passenger vehicle sales to be ZEVs. ACCII's model years will require ZEVs to make up 35 percent of new passenger vehicles by 2026, 68 percent by 2030, and 100 percent by 2035.

The California Energy Commission (CEC) projects 1.7 million plug-in electric passenger vehicles in 2030, and 15.2 million plug-in electric passenger vehicles in 2035.[25] CEC's projections are based on EV sales goals set by Executive Order N-79-20, ACCII, and other EV regulations. Assembly Bill 2127 (AB 2127), enacted in 2018, mandates the CEC to conduct a biennial assessment of the electric vehicle (EV) charging infrastructure required to achieve the state's EV goals. The CEC's most recent analysis indicates that by 2030 California will need a total of 1,008,844 public and shared private EV chargers, including 969,844 Level 2 chargers and 39,000 direct current fast chargers (DCFC), statewide to support California's projected 7.1 million light-duty vehicles.[26] Since the passing of Assembly Bill 2127, the CEC estimates that 241,597 level 2 chargers and 19,207 DCFC have been deployed or are funded to be installed.[27] An additional 728,247 level 2 chargers and 19,793 DCFC will need to be installed statewide, as shown in **Table 4-11**. Accordingly, a massive build out of EV charging infrastructure is needed in the IE empire to help support California's ZEV goals.

Table 4-11
Estimated Statewide EV Charging Needs – CEC 2024 Staff Report

Category	Level 2	DCFC
Existing Publicly Available and Shared Private Chargers	83,597	10,258
Chargers for which Funding is Allocated	158,000[a]	9,000[a]
Total Existing + Funded	**241,597**	**19,207**
AB 2127 Report 2030 Estimate of Charging Needs	969,844	39,000
Number of Chargers Needed to Achieve 2030 Targets	**728,247**	**19,793**

NOTE:

a. CEC's 2024 Revised Staff Report did not specify between Level 2 and DCFC. It only provided an estimate of total chargers for which funding is allocated (167,000). Charger counts are based on 2023 DCFC chargers which had funding allocated.

SOURCE: CEC 2024 Revised Staff Report: Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment

According to the CEC's 2024 Revised Staff Report, by 2030 Riverside County will need 1,258 DCFC and 22,944 level 2 chargers, while San Bernardino County will need 1,116 DCFC and 21,076 level 2 chargers.[28] Using capital cost estimates provided by a private contractor to San Bernardino Council of Governments, the estimated cost associated with these additional public and shared private chargers would be $1.4 billion, including infrastructure and construction costs.

Federal grant funding for EV charging infrastructure is available for the IE region through the National Electric Vehicle Infrastructure (NEVI) and Charging and Fueling Infrastructure (CFI) funding programs. State funding is available through the California Electric Vehicle Infrastructure Project (CALeVIP) and the Clean Transportation Program: Charging Infrastructure for Government Fleets (CTP Government Fleets) grant. The amounts of potential funding for EV

25 CEC, 2024. Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Second Assessment Revised Staff Report. Available at: https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment

26 Ibid.

27 Ibid

28 Ibid.

charging infrastructure for the IE region between the three programs is summarized in **Table 4-12**. If CFI and California NEVI continue to open annual grants like those that occurred for FY 2022 and 2023, the maximum expected funding for EV charging infrastructure in the IE region by 2028 is approximately $322 million. This estimate is conservative in that the maximum amount of funding potential is assumed for the NEVI and CFI grant programs.

Table 4-12
Potential EV Charging Infrastructure Grant Funding Available to the IE Region

Funding Source	Potential Fund Estimates	Years Available
NEVI	$205,714,286	2024-2027
CFI	$95,398,594	2024-2027
CALeVIP 1.0	$529,525	2024
CALeVIP 2.0	$2,123,312	2024
CTP Government Fleets Grant	$18,000,000	2024
Total Available through 2028	**$321,765,716**	**2024-2027**

With the Inland Empire needing approximately $1.4 billion in funding to expand EV charging infrastructure through 2030, the anticipated maximum available funding from State and Federal grants ($322 million) represents just a fraction of that need (approximately 23 percent). **Table 4-13** summarizes funding needs vs. potential funding for the IE region.

Table 4-13
Inland Empire: Estimated Potential Funding vs. Estimated Funding Needed for 2030 EV Charging Infrastructure

Category	Amount
Potential CFI Funding	$95,398,594
Potential NEVI Funding	$205,714,286
CALeVIP (1.0 and 2.0)	$2,652,837
CTP Government Fleets	$18,000,000
Total Potential Grant Funding	**$321,765,716**
Estimated Charging Funding Needed by 2030	**$1,409,120,000**

Implementation-ready

The I-REN and Clean Cities Coalition are potential program administration and implementation partners for this regional measure. Although installation of EVCS typically requires a permit from the local jurisdiction, extensive environmental review (e.g., review under CEQA or NEPA) is not required.

Implementation of this regional measure can leverage regional EV readiness planning previously completed by CVAG (Coachella Valley Plug-In Electric Vehicle Readiness Plan[29]), SCAG (Southern California Plug-In Electric Vehicle Readiness Plan[30]), and WRCOG (Western Riverside County Plug-In Electric Vehicle Deployment Plan[31]), as well as plans completed by local jurisdictions (e.g., cities of Riverside and Rancho Cucamonga).

Federal Highway Administration Alternative Fuel Corridors

Implementation is also supported by alternative fuel corridors designated by the Federal Highway Administration (FHWA) to support installing EV charging, hydrogen, propane, and natural gas fueling infrastructure at strategic locations along major national highways.[32] The designation of Alternative Fuel Corridors has grown in importance because it is now tied to federal and state funding provisions (see discussion of the NEVI funding program below). The FHWA designates each corridor as either "Corridor Pending" or "Corridor Ready," based on several readiness factors, with "Corridor Ready" considered a priority for investment and development of fueling and charging.

Table 4-14 lists the designated "Corridor Ready" corridors in the Riverside and San Bernardino County region for EV charging.

Table 4-14
FHWA Alternative Fuel "Corridor Ready" Designations - EV

San Bernardino County	Riverside County
• I-15 between Riverside County line and Calico Rd. (East of Barstow) • I-10 between Los Angeles County line and Riverside Couty line. • SR-60 Los Angeles County line to Riverside County line. • SR-91, I-215 to Orange County line. • I-215 Riverside County line to University Pkwy. • SR-210, Los Angeles County line to I-10.	• I-15, San Bernardino County line to San Diego County line. • I-10, San Bernardino County line to Summit Road. • I-215, San Bernardino County line to I-15. • SR-60, San Bernardino County line to I-10.

The consideration of "Corridor Pending" corridors is also important, as many of these corridors in the region serve disadvantaged communities. These corridors, listed in **Table 4-15** may not be a current priority for federal and state funding programs, but they could benefit from alternative investment opportunities that bring them up to "Corridor Ready" status.

29 ICF, 2014, Coachella Valley Plug-In Electric Vehicle Readiness Plan. Available at: https://www.cvag.org/library/pdf_files/trans/CVAG_PEV_Readiness_Plan%20(FINAL%20print).pdf

30 SCAG, 2021, Southern California Plug-in Electric Vehicle Readiness Plan. Available at: https://www.energy.ca.gov/sites/default/files/2021-04/CEC-600-2021-018.pdf

31 UCLA Luskin Center for Innovation, 2013, Western Riverside County Plug-in Electric Vehicle Deployment Plan. Available at: https://scag.ca.gov/sites/main/files/file-attachments/scag_ucla_luskin-wrcog_pev_deployment_plan_final.pdf?1605815092

32 For more information, see: https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

Table 4-15
FHWA Alternative Fuel "Corridor Pending" Designations – EV and Hydrogen

	San Bernardino County	Riverside County
EV	• I-15, Calico Rd. to Nevada state line. • I-40, I-15 to Arizona state line. • SR-58, I-15 to Kern County line. • US-395, I-15 to Kern County line.	• SR-79, I-10 to Sanderson Ave., and SR-74 to I-15. • SR-74, I-215 to San Jacinto St. • SR-111, I-10 to Vista Chino, and Cesar Chavez St. to SR-86 • SR-86, SR-111 to Imperial County line.
Hydrogen	• I-10 entire length in county • I-15 entire length in county	• I-10 entire length in county • I-15 entire length in county • SR-60 entire length in county • SR-91 entire length in county

Existing Funding Sources

National Electric Vehicle Infrastructure Funding Program (NEVI)

The National Electric Vehicle Infrastructure (NEVI) funding program prioritizes large-scale deployment of direct current (DC) EVCS charging in the U.S.[33] The $5 billion NEVI formula program aims to establish a nationwide network of 500,000 chargers by 2030. Initially, funding under the formula grant program is directed to designated Alternative Fuel Corridors for electric vehicles to build out this national network, particularly along the Interstate Highway System. When the national network is fully built out, funding may be used on any public road or in other publicly accessible locations. An additional $2.5 billion will be provided through a discretionary grant program, announced on March 14, 2023, that will be aimed at supporting rural charging, building resilient infrastructure, and increasing EV charging access in underserved and overburdened communities (i.e., LIDACs).

For the NEVI formula grants, each state was directed to develop a deployment plan. Caltrans and the California Energy Commission (CEC) developed the plan for California, which was approved in September, 2023.[34] California's plan designates priority groups of FHWA Alternative Fuel Corridors, as shown in **Table 4-16**, indicating a minimum number of new stations and a total number of new charging ports within each group. NEVI California has $384 million that it will award to a minimum number of projects throughout the state along specified Alternative Fuel Corridors. The plan further ranks the top six groups, three of which fall within the Riverside and San Bernardino County Region.

Each Alternative Fuel Corridor is allocated a suggested number of charging ports (individual connectors able to charge a car) along with a minimum number of charging stations (location containing multiple charging ports, similar to a gas station). The NEVI California Plan indicates it will fund a minimum of 28 charging stations with a goal of 291 applicable charging points.

33 For more information, see: https://www.fhwa.dot.gov/environment/nevi/

34 California's plan can be found here: https://www.energy.ca.gov/programs-and-topics/programs/national-electric-vehicle-infrastructure-nevi-formula-program

Table 4-16
Corridor Pending Designations

Corridor Group	Segments	Minimum New Stations	Total New Charging Points
7	SR 58: Buttonwillow to Barstow	4	16
	I-15: Hesperia to Nevada	2	45
	I-40: Barstow to Needles	2	12
16	I-8: San Diego to El Centro	2	8
	I:15 San Diego to Murrieta	2	8
	I-805: San Diego to San Ysidro	1	4
19	I-210: Sylmar to Redlands	2	8
	I-215: Murrieta to San Bernardino	2	8
	I-405: Mission Hills to Irvine	1	4

Riverside and San Bernardino counties contain seven Alternative Fuel Corridors, which have been allocated 13 minimum new charging stations, and 101 charging points. With charging stations receiving a maximum of $13,714,286 and charging points a maximum of $1,319,588, Riverside and San Bernardino Counties have the potential to be awarded a maximum of $205,714,286 through NEVI grants.

Federal Charging and Fueling Infrastructure (CFI) Discretionary Grant Program

On January 11th, the Biden-Harris Administration announced $623 million in grants to help build out an EV charging network across the U.S., as part of the Bipartisan Infrastructure Law's $2.5 billion Charging and Fueling Infrastructure (CFI) Discretionary Grant Program. The CFI program is a competitive program administered by the Federal Highway Administration that will fund 47 EV charging and alternative-fueling infrastructure projects in 22 states and Puerto Rico, including construction of approximately 7,500 EV charging ports. It complements the $5 billion NEVI formula program described above.[35] Of the 47 projects, 10 are in California, and 2 are in the IE region. Based on the $31,635,156 in awards, IE region projects received approximately 5 percent of total funding for the first round of CFI funding. Assuming this trend continues for the next 4 years of the CFI program (including 2024), the region can expect $321,765,716 in additional funding from CFI grants.[36]

California Electric Vehicle Infrastructure Project (CALeVIP)

The California Electric Vehicle Infrastructure Project (CALeVIP) provides funding for installing publicly available EV charging stations to support the rapid adoption of electric vehicles across California.

35 More information on this program is available here: https://www.transportation.gov/briefing-room/biden-harris-administration-announces-623-million-grants-continue-building-out

36 CFI. Charging and Fueling Infrastructure Discretionary Grant Program. Available at: https://www.fhwa.dot.gov/environment/cfi/

CALeVIP 1.0 was launched in 2017 and provided rebates for installing Level 2 and direct current (DC) fast chargers in 13 regional projects across 36 California counties. The program was funded by a $186 million block grant from the California Energy Commission's Clean Transportation Program, which supports innovations in transportation and fuel technologies. CALeVIP 1.0 also received an additional $37 million in regional partner funding. San Bernardino County has $529,525 remaining for level 2 chargers through CALeVIP 1.0, but all the funding for Riverside County has been awarded as of February 2024.[37]

CALeVIP 2.0, launched in 2021, is a continuation of the EV charging funding with an emphasis on installing high-speed DC fast chargers only, directing 50 percent of overall project funding for installations in low-income and disadvantaged communities, and giving top priority to applicants who have done pre-planning. CALeVIP 2.0 has $30 million in rebates available through the Golden State Priority Project, of which, $6.3 million remains for EV charging funding for the Eastern Region of California. Eligible applicants must be a site owner or authorized agent (such as a property manager, EV service provider or contractor), and be a business, sole proprietorship, nonprofit organization, or a public or government entity, that is either based in California or operates as a California-based affiliate, or be a California Native American tribe listed with the Native American Heritage Commission. If CALeVIP 2.0 designates a third of the remaining awards to the IE region, a total of $2,652,837 in funding will be available through both CALeVIP 1.0 and 2.0.

Clean Transportation Program (CTP) Charging Infrastructure for Government Fleets

CTP Charging Infrastructure for Government Fleets is awarding $30 million to government entities to expand charging infrastructure that services their vehicle fleets.[38] Eligible projects must install at least 100 charging ports and be installed at locations government feet vehicles are designated to dwell. EV chargers funded by this grant program can be available to the public if they meet applicable state requirements. Projects are eligible for up to 70 percent of the total project cost or $6 million, whichever is less. Assuming WRCOG, SBCOG, and CVAG apply for three separate projects, a maximum of $18 million will be available to the IE region.

Building Decarbonization

Background

Building energy use, which includes electricity, oil, propane, and natural gas usage, is a major contributor to GHG emissions and local and regional air pollution in San Bernardino and Riverside counties. As such, building energy-related reduction measures yield substantial GHG reductions and a number of additional benefits, particularly for Low-Income and Disadvantaged Communities (LIDACs) that disproportionately bear the negative impacts of local pollution. Building energy emissions accounted for approximately 40 percent of total regional GHG

37 CALeVIP 1.0. Southern California Level 2 Incentive Project Available Funding. Available at: https://calevip.org/incentive-project/southern-california-level-2

38 CTP Charging Infrastructure for Government Fleets. Solicitation Manual. Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.energy.ca.gov%2Fsites%2Fdefault%2Ffiles%2F2023-12%2F00_GFO-23-606_Solicitation_Manual_ada.docx&wdOrigin=BROWSELINK

emissions for WRCOG in 2017, 35 percent of total regional GHG emissions for SBCOG in 2016, and 18 percent of total regional GHG emissions for CVAG in 2018.

California has ambitious climate goals, including a 48 percent reduction of GHG emissions below 1990 levels by 2030, making building decarbonization a key pillar in the state's climate goals. There are several available strategies to advance building decarbonization, including building electrification, building energy efficiency, and solar and battery storage installation, all of which are relatively low-cost, low-risk strategies for achieving state and regional climate goals. A critical component of achieving this goal is the rapid electrification of buildings along with deployment of renewable energy sources.

Currently, there are multiple Federal and state programs that provide funding for building decarbonization, but it is not nearly enough to fund the infrastructure to meet state and regional goals and close existing energy equity gaps. In addition, the region has historically faced challenges in receiving equitable opportunities to participate in energy efficiency and advanced energy. This regional measure builds on several measures in WRCOG's Subregional CAP (2022), SBCOG's Regional GHG Reduction Plan (2021), and the individual CAPs produced in CVAG's jurisdictions.

By incentivizing building decarbonization, the Riverside and San Bernardino County Region can reduce GHG emissions and indoor and outdoor air pollution associated with powering buildings and their operations. In addition to environmental benefits, this measure has the capability to improve energy affordability and create local green job opportunities for residents living in the region.

Description of Regional Measure

Goal & Purpose

The adoption of building decarbonization measures has the potential to significantly reduce GHG emissions from municipal and residential buildings, as well as provide additional environmental and social benefits such as local and regional air pollution and advancing energy equity. The goal for building decarbonization is to improve building energy efficiency, achieve greater electrification, deploy additional renewable energy and storage, reduce outdoor particulate matter in the indoors, mitigate against extreme heat, reduce indoor concentrations of NO2, and increase energy resilience. Energy efficiency measures are intended to promote the efficient use of energy and reductions in energy use, electrification pertains to replacing natural gas appliances with electric and/or zero carbon alternatives, and renewable energy measures are intended to lower the carbon content of electricity supplied to homes and municipal buildings.

Scope of Potential Activities Under This Measure:

- Municipal buildings: Public sector energy efficiency, integrated demand side management projects, energy efficiency, equipment electrification, and the installation of solar PV and energy storage projects by public agencies, as well as related investments to allow the facility to serve as a resilience center in the event of a grid outage, high heat day, or other emergency.

- Residential buildings: Establishing a direct install program that complements the statewide CEC Equitable Building Decarbonization Program, and provides funding for decarbonization retrofits to low- and moderate-income households such as, but not limited to:
  - Heat pumps for space heating and cooling
  - Heat pump for water heater, unitary and central
  - Duct testing/sealing, new ducts, returns, and registers
  - Occupant controlled smart thermostats
  - ENERGY STAR certified appliance replacements
  - Air sealing, insulation, and solar window film
  - Low-flow showerheads and faucets
  - Induction range or cooktops
  - Electric clothes dryers
  - LED bulbs and fixtures
  - Attic fan installation
  - Thermal bridging removal
  - Efficient pool pump installation
  - Installing awnings or black out UV window shades
  - Planting strategically placed trees to provide shade to the facility or residence
  - Solar and battery storage installation
  - Replacement of roofs with cool roofs when needed to enable solar PV installation
- Residential buildings: Leveraging statewide incentive programs that encourage the adoption of low carbon technologies.

Participants (Implementing Parties)

This program will require a diverse set of participants and stakeholders to be successful. To ensure that it is run efficiently and effectively, it will be important to establish a central authority that is responsible for the coordination of all program aspects.

For municipal buildings, the anticipated program participants include:

- SBCOG, WRCOG, CVAG, and their member agencies
- Department facility managers and engineers
- I-REN through WRCOG
- Community groups

For the residential sector, participants will include:

- Homeowners
- Tenants

- Homeowner associations
- Community-based organizations

For both residential and municipal, participants will include:

- Contractors
- Financiers
- Electric appliance manufacturers
- Cities and counties
- Association groups

Stakeholder and Site Host Considerations

The success of this regional measure will depend on government leadership and motivated site hosts for the municipal building action. For the residential action, strong communication will be necessary to inform residents of the program, with different approaches likely necessary for owners and tenants. Contractor training will also be necessary to ensure that contractors are well-versed in alternative technologies and/or processes that enable building decarbonization.

Authority to Implement

Authority to implement this regional measure lies with WRCOG, SBCOG, and CVAG, whose governing power comes from California Government Code, particularly Title 5, Division 1, Chapter 6, Section 6500 et seq. In addition, some aspects of the measure pertaining to home energy efficiency upgrades could be best be administered by I-REN.

In addition, local action and authority by cities can support and amplify efforts to reduce GHGs, which could include, for example, local requirements that all new construction be all-electric, requirements about levels of EV charging infrastructure in new construction, among others. Specifically, local governments have the option to adopt building ordinances that exceed statewide building code requirements.

Lastly, at the regional level, air districts have the authority to set equipment and appliance standards for criteria pollutant and toxics emissions levels. In this instance, South Coast Air Quality Management District and Mojave Desert Air Quality Management District are the best suited agencies to implement. Additional regulatory and/or statutory authorities that may be needed to implement this measure are described, by the agency, in Appendix C.

Geographic Coverage

This measure is applicable to the entire Inland Empire region, inclusive of all jurisdictions belonging to WRCOG, SBCOG, and CVAG.

GHG Reduction and Cost Metrics

The analysis includes GHG emissions from municipal and residential buildings. The region is home to at least 54 municipal government agencies, which own and operate many buildings. It is

estimated that the municipal buildings in the region emit approximately 802,690 $MTCO_2e$ per year. The proposed municipal buildings program could reduce GHG emission by 4,877 $MTCO_2e$ per building and cost approximately $2 million per building.

Municipal building GHG emissions were estimated by using municipal building energy emissions data for the year 2014 for the unincorporated areas of San Bernardino County and scaling these emissions to San Bernardino and Riverside counties using population. The 2014 municipal building energy data used as the base for scaling was provided in the San Bernardino County Community and Municipal Greenhouse Gas Inventory, developed by ICF in 2017. For residential buildings, around 5 million people call the region home, and residential building emissions contribute to approximately 5,241,346 $MTCO_2e$ per year. The proposed low- to moderate-income residential program could reduce GHG emission by 1.84 $MTCO_2e$ for each single family, 1.96 $MTCO_2e$ for each multifamily home, and 2.21 $MTCO_2e$ for each manufactured home. The average cost by building type would be $20,850, $36,250, and $31,800 respectively.

Residential building GHG emissions were estimated by using residential electricity and residential natural gas emissions data for the year 2016 for San Bernardino County and then scaling these emissions to the rest of the region using population. The residential emissions data used as the base for scaling was provided in the San Bernardino County Regional Greenhouse Reduction Plan, developed in 2021.

Additional methodological information about the calculations is available in Appendix B.

Other Metrics for Tracking Progress

- Number of electrification upgrades made in municipal buildings
- Number of energy efficiency upgrades made in municipal buildings
- Number of rooftop solar and battery storage installed on municipal buildings
- Number of homes retrofitted
- List of installed measures
- Expenditure breakdowns
- Number of occupants in retrofitted homes
- Locations of retrofitted homes (zip code, climate zone, utility service territory)
- Participant opt-out rate
- Participant satisfaction

Example Projects for Implementation

Municipal Buildings

A representative project was modeled to estimate the GHG emissions reduction potential of decarbonizing municipal buildings. The representative project used a medium-sized, public

service office building located in Riverside as its main assumption. This project accounted for the following building decarbonization actions:

- Various energy efficiency measures (EEMs) that save 10 percent of the facility's annual electric consumption;
- Water heating sources changed from gas to electric via heat pump water heaters;
- Heating, ventilation, and air conditioning upgraded with heat pumps;
- And rooftop solar plus battery storage right-sized after EEMS installed;

The project described above would cost slightly over $2M ($2,059,248) and has the potential to achieve a GHG emissions reduction of 4,461 $MTCO_2e$. This is equivalent to removing 992 gasoline-powered passenger vehicles off the road for one year. The project costs and GHG reductions are detailed for each project component in **Table 4-17**. Extrapolating the representative project across all 54 member agencies equates to a GHG emissions reduction of 240,894 $MTCO_2e$, the equivalent of removing 53,606 gasoline-powered passenger vehicles off the road for one year.

Table 4-17
Results for One Representative Decarbonization Project

Project Components	Project Cost	Project Lifetime GHG Reduction ($MTCO_2e$)
Energy Efficiency Upgrades	$83,455	290
Heat Pump Water Heater Installation	$30,000	18
Heat Pump HVAC Installation	$449,015	216
Solar PV and Battery Storage Installation	$1,496,778	3,937
Total	**$2,059,248**	**4,461**

Residential Buildings

Proposed decarbonization efforts for the residential sector align with the CEC's upcoming Equitable Building Decarbonization Direct Install Program, which provides low- or no-cost decarbonization retrofits to low- and moderate-income (LMI) households, and DOE's upcoming HOMES and HEERA rebate programs. Complementing these programs, the region will also seek to add components such as solar photovoltaic and battery storage systems where possible to address electricity bill affordability for LIDAC households. By packaging measures within the programs, the region can simplify and streamline the process for participants and contractors with highly replicable activity, and avoid the need for a custom solution to be developed for each building. The actions associated with this program are designed to achieve bill savings and GHG emission reductions in participating household while improving indoor air quality, energy affordability, and resiliency to extreme heat, which is particularly important for many jurisdictions in the region located in a desert climate, where temperatures can reach upward of 120 degrees during summer days and hover around 90−100 degrees at night.

As an example, a direct install program with $50 million in funding could reach over 2,200 homes in the region and provide necessary energy electrification. For purposes of calculating

GHG emissions reduction, this example assumes the budget is allocated by home type: 85 percent of the budget to single-family homes; 10 percent to multifamily homes; and 5 percent to manufactured homes. The example project assumes the following upgrades and actions will take place in each home: heat pump water heaters (HPWH), ducted air source heat pump, electric or induction cooktops, electric dryer, smart thermostat, insulation, low-flow showerheads and faucets, electrical and remediation, duct cleaning and sealing, recycling and disposal, LED lighting, as well as the services of a concierge/ intake advisor. This direct install program will be implemented in residential homes either within LIDAC census tracts and / or for income qualified households.

The GHG reduction potential of these actions was estimated for single-family, multifamily, and manufactured homes. For the purposes of this example, the estimated average cost for the direct install program in single-family homes, multi-family homes, and manufactured homes is listed in **Table 4-18**, **Table 4-19**, and **Table 4-20**. To determine the allocation of the $50 million budget for each home type, the current amount of available incentives/rebates available for the installed actions is subtracted from the average installation cost per home to get the total CPRG funds needed per home. The total amount of CPRG funds allocated for each home type, out of the $50 million pot, is then divided by the CPRG funds needed per home to determine the number of homes reached in the program. The amount of CPRG funds allocated and total number of homes reached is provided for each home type in the first two rows of Table 4-18, Table 4-19, and Table 4-20.

Table 4-18
Results for Single-Family Home (SFH) Participating in the Direct Install Program

CPRG Funds (85% allocation)	**$42,500,000**	
Number of SFHs Reached	**2,038**	
Project Components	**Average Installed Cost**	**Annual GHG Reductions per SFH ($MTCO_2e$)**
HPWH	$8,500	0.733
Air Source Heat Pump (Ducted)	$15,000	0.312
Electric or Induction Cooktop	$2,500	0.021
Electric Dryer	$800	0.032
Smart Thermostat	$375	0.021
Weatherization/Insulation	$2,500	0.598
Low Flow Showerheads and Faucets	$100	0.125
Electrical and Remediation	$6,800	-
Duct Cleaning and Sealing	$1,200	-
Recycling and Disposal	$500	-
LED Lighting	$250	-
Concierge/Intake Advisor	$750	-
Average Per SFH	**$39,275**	**1.84**
Total Incentives Before CPRG	**$18,425**	
CPRG Funds Needed per Home (Average Cost minus Total Incentives Before CPRG)	**$20,850**	

Table 4-19 Results for Multifamily Home (MFH) Participating in the Direct Install Program		
CPRG Funds (10% allocation)	**$5,000,000**	
Number of MFHs Reached	**138**	
Project Components	**Average Installed Cost**	**Annual GHG Reductions per MFH ($MTCO_2e$)**
Central HPWH	$20,000	0.670
Air Source Heat Pump (ducted)	$18,500	0.327
Electric or Induction Cooktop	$2,500	0.021
Electric Dryer	$800	-0.015
Smart T-Stat	$375	0.020
Weatherization	$2,800	0.813
Low Flow Showerheads and Faucets	$75	0.120
Remediation/Elec (per unit)	$8,500	-
Duct Cleaning and Sealing	$1,000	-
Recycling and Disposal	$400	-
LED Lighting	$200	-
Concierge / Intake Advisor	$650	-
Average Per MFH	**$55,800**	**1.96**
Total Incentives Before CPRG	**$19,550**	
CPRG Funds Needed per Home (Average Cost minus Total Incentives Before CPRG)	**$36,250**	

Table 4-20 Results for Manufactured Homes Participating in the Direct Install Program		
CPRG Funds (5% allocation)	**$2,500,000**	
Number of Homes Reached	**79**	
Project Components	**Average Installed Cost**	**Annual GHG Reduction per Manufactured Home ($MTCO_2e$)**
HPWH	$9,800	0.687
Air Source Heat Pump (Ducted)	$17,000	0.369
Electric or Induction Cooktop	$2,800	0.021
Electric Dryer	$950	0.032
Smart Thermostat	$375	0.022
Weatherization/Insulation	$3,800	0.962
Low Flow Showerheads and Faucets	$10,500	0.120
Electrical and Remediation	$100	-
Duct Cleaning and Sealing	$1,300	-
Recycling and Disposal	$500	-
LED Lighting	$250	-
Concierge/Intake Advisor	$850	-

Table 4-20 Results for Manufactured Homes Participating in the Direct Install Program		
Average Per Home	**$48,225**	**2.21**
Total Incentives Before CPRG	**$16,425**	
CPRG Funds Needed per Home (Average Cost minus Total Incentives Before CPRG)	**$31,800**	

Based on the results of Table 4-18, the 2,038 single-family homes participating in the Direct Install Program have the potential of reducing approximately 3,754 $MTCO_2e$ per year. Based on the results of Table 4-19, the 138 multifamily homes have approximately 270 $MTCO_2e$ of GHG reduction potential per year. Based on the results of Table 4-20, the 79 manufactured homes have approximately 174 $MTCO_2e$ of GHG reduction potential per year. In total, this equates to approximately 4,197 $MTCO_2e$ reduced in residential buildings throughout the region per year. In addition to the GHG reduction potential, the implementation of this program can contribute to energy equity of LMI households and help to lower energy bills, providing long-term savings for residents.

Implementing Schedule and Milestones

A sample timeline is provided below for implementing the building decarbonization measure described above in the context of the CPRG program.

- March 1, 2024: Deliver CAP to EPA
- Throughout 2024: Identify key actions to implement for each building decarbonization measure
- Early 2025:
  - Coordinate resources across jurisdictions and take initial actions across municipal and residential building decarbonization
  - Estimate GHG emissions from the building decarbonization actions
  - Estimate LIDAC benefits from the building decarbonization actions
- Early 2026: Continue implementing building decarbonization actions
- Mid 2026: Implement building decarbonization pilot programs and short-term strategies for GHG reductions
- Mid-late 2026: Secure approval and budget for ongoing building decarbonization actions
- Mid-2027: Deliver CPRG Status Report to EPA
- 2027 onward: Continue to implement building decarbonization and reduce GHGs; track progress across the region

Actions that can be taken to support building decarbonization include:

- Changes to regulations to enable building decision-makers to increase energy efficiency.

- Implement electrification after energy efficiency measures, increasing the effectiveness of electrification by reducing the amount of electricity wasted by inefficient appliances and leaks in building envelopes.
- Strengthening of energy codes and green building policies (Reach Codes) to encourage lower carbon buildings during both construction and operations.
- Facilitate net zero building development by prioritizing low-emissions practices across the lifecycle (in construction, maintenance, and end of life) of new buildings and retrofits to existing buildings.
- Expand or create new programs and incentives for clean energy retrofits and upgrades
- Conduct building energy audits and develop facility decarbonization plans, and integrate projects into CIPs

Summary of Implementation Grant Suitability

High GHG Reduction Potential

This measure addresses one of the region's largest GHG emissions sectors. Therefore, the GHG reduction potential is high. It also addresses one of the most important long-term GHG reduction challenges: reducing use of natural gas in existing buildings. By electrifying and increasing the energy efficiency of buildings, the region can transition to cleaner forms of energy and use less cumulative energy, which further contributes to GHG reductions.

- WRCOG: Building Energy was approximately 40 percent of total regional GHG emissions for 2017.
- SBCOG: Building Energy was 35 percent of total regional GHG emissions for 2016 and is projected to be 39 percent for the 2045 Business as Usual scenario.
- CVAG: Building Energy was 18 percent of total regional GHG emissions for 2018.

Transformative

This measure supports a critical State of California climate change priority – building decarbonization. The CARB Scoping Plan Update (2022) identifies building decarbonization as a key priority given its contribution to total statewide GHG emissions, and the California Energy Commission (CEC) has a long history of strengthening the building and appliance code to achieve greater energy efficiency and has more recently spearheaded building decarbonization programs (see CEC Equitable Building Decarbonization Program). Building decarbonization can have transformative impact by increasing energy resilience within communities and providing long-term cost savings from reduced energy consumption. Finally, the shift towards decarbonization in residential homes and municipal buildings can stimulate the growth of local green industries by creating more job opportunities in renewable energy and energy efficiency.

Workforce Implications

The proposed building decarbonization priority measure has numerous implications on workforce planning and development. For example, energy efficiency improvements at buildings and installation of electrical appliances translate into good paying local jobs, and also requires appropriate workforce training programs. Likewise, the financing products of the revolving loan fund and zero-interest loan for public agencies requires appropriately trained personnel to

administer the programs and to monitor and verify eligibility requirements. A detailed workforce planning analysis is included in *Appendix E: Workforce Analysis Methods*.

Regional Support

There is strong regional support for decarbonizing residential and municipal buildings throughout the region. This support is evidenced by multiple programs across the region that incentivize increasing energy efficiency and PV and battery storage installation, and the stated commitment of building decarbonization measures in various Climate Action Plans across the region. One such existing program is the Clean Energy Coachella Valley Upgrade.

LIDAC Benefits

Existing buildings contribute significantly to regional GHG emissions due to their energy needs for heating and cooling. Decarbonizing existing buildings enables a transition to renewable electricity as a primary energy source, along with increased energy efficiency. Building electrification along with solar PV and battery storage installation can provide multiple co-benefits for lower-income and rent-burdened households, including reduced utility bills, better indoor air quality and improved energy resilience. This is particularly true as the stock of homes in LIDAC communities are generally older and less efficient, and as such, the GHG reductions could be greater relative to newer buildings. A detailed analysis of the region's LIDACs, their climate change vulnerabilities, and the co-benefits expected from implementation of this regional measure is included in *Chapter 5: LIDAC and Co-benefits Analysis*.

Need For Funding

As presented below, competitive and formula funding, in addition to tax incentives, exist for building decarbonization initiatives. However, these funding sources are not sufficient to cover the costs of a regional municipal and residential building decarbonization program, as shown in Table 4-18 through Table 4-20.

Implementation Ready

Existing regional organization for public outreach, engagement, and implementation exists through I-REN, the association of governments, local businesses, regional distribution networks, CBOs, etc., which contributes to reaching a broad audience and expediting implementation.

Building decarbonization projects are "implementation ready" and do not require environmental review (e.g., CEQA), which expedites the implementation of these actions.

Existing Funding Sources

Federal Funding Sources:

Opportunity Name	Administering Agency
Energy Efficiency and Conservation Block Grant Program (EECBG)	DOE SCEP
Solar for All	EPA
Greenhouse Gas Reduction Fund other financing	EPA
Green and Resilient Retrofit Program	HUD via IRA

Opportunity Name	Administering Agency
Clean Energy Tax Credits	Treasury and IRS via IRA
State-Based Home Energy Efficiency Contractor Training Grants	DOE SCEP
Latest and Zero Building Energy Codes	DOE SCEP
Energy Efficiency and Conservation Block Grant (EECBG) Community Energy Fellowship	DOE SCEP
Weatherization Assistance Program	DOE SCEP
Home Energy Rebates	DOE SCEP
Homeowner Efficiency Rebates Program (HOMES)Homeowner Managing Energy Savings (HOMES)	DOE
Home Electrification and Appliance Rebates Program (HEEHRA)	DOE

Energy Efficiency and Conservation Block Grant Program

The Energy Efficiency and Conservation Block Grant (EECBG) Program is designed to assist states, local governments, and Tribes with implementing strategies to reduce energy use, cut fossil fuel emissions, and improve energy efficiency. Eligible entities can apply for $430 million in formula grant funding for activities such as developing and implementing an energy efficiency and conservation strategy; conducting building energy audits; establishing energy efficiency improvement incentive programs; developing onsite renewable energy technology in government buildings; and developing programs to conserve energy used in transportation. Local governments and Tribes can apply for funding through April 30, 2024.

Solar For All

The Environmental Protection Agency (EPA) released the $7 billion Solar for All Notice of Funding Opportunity on June 28, 2023. This program is part of the Greenhouse Gas Reduction Fund, which is described in more detail below. Solar for All will award up to 60 grants to states, territories, Tribal governments, municipalities, and nonprofits to expand the number of low-income and disadvantaged communities primed for residential solar investment – enabling millions of low-income households to access affordable, clean solar energy. This program will install billions of dollars of solar panels on the homes of low-income families and create more equitable access to solar energy.

The Greenhouse Gas Reduction Fund and Other Financing

The Inflation Reduction Act created the Greenhouse Gas Reduction Fund, a historic $27 billion investment to mobilize financing and private capital to address the climate crisis and promote energy independence while lowering energy costs. The Fund is designed to reduce GHG emissions and other air pollutants, deliver benefits of GHG and air pollution reduction projects to LIDAC communities, and stimulate the deployment of GHG and air pollution reducing projects. The Greenhouse Gas Reduction Fund is implemented through three grant competitions: National Clean Investment Fund, Clean Communities Investment Accelerator, and Solar for All.

The National Clean Investment Fund competition will provide about $14 billion in grants to 2 to 3 national nonprofit clean financing institutions that partner with the private sector to provide

accessible, affordable financing for clean technology projects across the country. The national nonprofit financing entities will enable communities to access the capital they need to install cost-saving and air pollution reducing clean technology projects. It also has at least 40 percent of capital flowing directly into low-income and disadvantaged communities.

The Clean Communities Investment Accelerator $6 billion competitive grant for 2 to 7 hub nonprofits to deliver funding and technical assistance to build the clean financing capacity of local community lenders working in low-income and disadvantaged communities.

The Green and Resilient Retrofit Program

The U.S. Department of Housing and Urban Development (HUD) runs the Green and Resilient Retrofit Program (GRRP), which provides owners of HUD-assisted multifamily housing with funding to reduce carbon emissions, improve utility efficiency, incorporate renewable energy sources, and make properties more resilient to climate hazards. Funding is available under three cohorts: Elements, Leading Edge, and Comprehensive. In total there is over $2 billion available in funding across the three cohorts.

The Element awards designate funding of up to $40 thousand per unit or $750 thousand per property for owners to include climate resilience and utility efficiency measures in projects that are already in the process of a recapitalization transaction. The Leading Edge awards provide up to $60 thousand per unit or $10 million per property in funding for retrofit activities to achieve an advanced green certification. Finally, the Comprehensive awards supplies up to $80 thousand per unit or $20 million per property in funding to properties with the highest need for climate resilience and utility efficiency upgrades.

Clean Energy Tax Credits

In June 2023, the Biden-Harris Administration’s Inflation Reduction Act (IRA) provided provisions that allowed state, local, and tribal governments, nonprofits, U.S. territories, rural energy co-ops, and more to access tax credits for building a clean energy economy. The IRA allows tax-exempt and governmental entities to receive elective payments for 12 clean energy tax credits as well as tax credits for electric vehicles and charging stations.

State-Based Home Energy Efficiency Contractor Training Grants

The United States Department of Energy released the State-Based Home Energy Efficiency Contractor Training Grant in 2023. The program provides $200 million to state energy offices so they can train, test, and certify residential energy efficiency and electrification contractors. States can partner with nonprofit organizations to develop and implement programs that will enable contractors to bring clean energy technology into homes.

Latest and Zero Energy Building Codes

In December 2023, the United States Department of Energy announced up to $530 million in technical assistance competitive grants available for the adoption and implementation of the latest model energy codes, zero energy codes, building performance standards, and innovative codes that achieve similar energy savings to the latest model and zero energy codes. The program is

administered through the DOE's SCEP and contains $1 billion in funding to modernize America's building stock through state and local action on building codes, while making buildings more resilient to extreme weather events. The funding streams are designed to provide flexibility in response to the broad variety of jurisdictional circumstances and allow grantees to pursue a pathway that fits their state and local contexts.

Community Energy Fellows

The Community Energy Fellowship is a program sponsored by the DOE's Office of State and Community Energy Programs. The Fellowship matched 25−35 recent graduates and mid-career clean energy professionals with Energy Efficiency and Conservation Block Grant Program formula-eligible local and Tribal governments. By hosting a fellow, governments can bolster their EECBG Program Projects, gain new perspectives from fellows, and accelerate the transition to affordable and resilient clean energy. Fellows can work on projects in topic areas such as energy efficiency, electric vehicle technology, renewable energy, and more.

Weatherization Assistance Program

The U.S. DOE's Weatherization Assistance Program (WAP) reduces energy costs for low-income households by increasing the energy efficiency of their homes while ensuring their safety and health. The WAP takes a "whole home weatherization" approach that analyzes the entirety of building systems, including heating and cooling systems, electrical system, and appliances, through the completion of energy audits. Each year, Congress appropriates funding for WAP implementation, which is eligible as formula grants based on low-income population, climate, and residential energy expenditure factors for all states, territories, and Tribes.

Home Efficiency Rebates (HOMES) Program

The DOE's HOMES Program provides California with $292 million project funding or performance-based rebates for whole-home energy retrofits for single-family homes and multifamily buildings. To be eligible for funding, a project must achieve certain thresholds of energy savings.

Home Electrification and Appliance Rebates Program (HEEHRA)

The Home Electrification and Appliance Rebates (HEEHRA) program uses federal funding to assist low- and moderate-income households electrify their appliances. $290 million in funding is allocated for California for qualified appliance rebates. Eligible applicants for rebates include low- or moderate-income (LMI) households below 150 percent of area median income, owners of eligible LMI multifamily buildings, and governmental, commercial or nonprofit entities carrying out a project for an eligible household or an owner of an eligible multifamily building. Rebates are available for the purchase and installation of qualified ENERGY STAR appliances and building materials including insulation, air sealing, electric panel upgrades, and electric wiring.

State Funding Sources:

Opportunity Name	Administering Agency
Equitable Building Decarbonization Program	California Energy Commission (CEC)
Imperial Irrigation District (IID) Energy Rewards Prescriptive Rebates	IID
IID Residential Rebates	IID
IID Residential Weatherization Program	IID
IID Tree for All Program	IID
IID EV Charger Rebates	IID
Riverside Public Utilities Energy Rebates	Riverside Public Utilities
TECH Clean California Statewide Incentive Program	TECH Clean California
Smart Thermostat Rebates	Golden State Rebates
Whole Building Electrification Alterations Incentive Program	California Energy-Smart Homes

Equitable Building Decarbonization Program

The California Energy Commission's (CEC) Equitable Building Decarbonization Program's goals are to reduce GHG emissions in homes, advance energy equity, encourage resiliency to extreme heat, improve air quality, and more. The program has two components, the Direct Install Program and the Statewide Incentives program. The former program provides low- or no-cost decarbonization retrofits to low- and moderate-income households throughout the state, while the latter incentivizes the adoption of low-carbon technologies in homes. As of February 2024, the CEC is accepting input on the development and implementation of the Equitable Building Decarbonization Program.

Imperial Irrigation District (IID) Energy Rewards Non-Residential Rebates

The IID Energy Rewards Program offers rebates for energy-efficient measures that customers purchase for business or non-residential organizations that reduce energy costs. Products and services eligible for rebates include programmable thermostats, vending misers, package terminal air conditioners and heat pumps, energy efficient motors, and HVAC systems. Applicants must purchase and install their qualifying products by December 31, 2024.

IID Energy Rewards Residential Rebates

The IID Energy Rewards programs offers various rebates for energy efficient measures that customers purchase for their homes to reduce energy costs and usage. The program stipulates that energy efficiency upgrades must be purchased and installed by December 31, 2024, to be eligible for a rebate. Appliances eligible for rebates include ENERGY STAR certified clothes washers and dryers, refrigerators, dish washers, and dual-pane windows. Other eligible upgrades include attic fans, shade screens, attic insulation, HVAC systems, and more.

IID Residential Weatherization Program

The IID Residential Weatherization Program provides up to $1,000 for energy saving services and equipment that reduces heating and cooling costs for its customers. Weatherization professionals will perform a complete home energy assessment to identify deficiencies and

opportunities for energy conservation. Through the program, once energy conservation opportunities are identified, installers make the repairs and improvements at no cost to the customer. IID customers enrolled in the district's Residential Energy Assistance Program (REAP) may receive an additional $500 in services.

IID Tree for All

In 2023, IID announced the Tree for All Program, a residential free shade program for its energy customers. IID provided 800 trees, all of which were claimed and planet by customers in the Imperial and Coachella Valleys. The trees available in the program were selected for their specific characteristics and ability to survive in the region's desert climate. The IID is planning for future Tree for All events.

IID EV Charger Rebates

For customers that have converted to an electric vehicle, IID is offering rebates of up to $500 to customers that have purchased and installed a Level 2 plug-in electric vehicle charger.

Riverside Public Utilities Energy Rebates

The Riverside PUC has multiple rebate programs that help customers save money by conserving energy. Energy rebates include air conditioning incentives, ENERGY STAR appliances, pool and spa pumps, pool pump billing credits, refrigerator recycling, tree power, and weatherization. In addition, the PUC is offering a $1,000 rebate for used battery electric or plug-in hybrid vehicles purchased or leased after January 1, 2023.

TECH Clean California Statewide Heat Pump Incentives

TECH Clean California is a statewide initiative to accelerate the adoption of clean space and water heating technology across California's buildings. The organization provides incentives for contractors to support the installation of HPWH in single family, multifamily, and commercial buildings. There are more than $37 million worth of incentives available through TECH Clean California. Eligible projects include heat pump, HVAC, and HPWH installations,

Golden State Rebates Smart Thermostat Rebates

Golden State Rebates offers savings of up to $75 on eligible ENERGY STAR certified smart thermostats for customers that are looking to replace an existing non-smart thermostat. Participants must be a residential customer on a residential rate with an active meter by a Participating California Utility for the installation address.

California Energy-Smart Homes Single Family, Multifamily Low-Rise, and ADU Whole Building Electrification Alterations Incentives

Whole building electrification alterations to existing single family, multifamily low-rise, accessory dwelling unit (ADU) projects require a conversion of all gas appliances and equipment to electric systems including heat pump space heating, heat pump water heating, induction cooking, and electric or heat pump clothes dryers. In 2024, California Energy-Smart Homes is offering $4,250 of incentives for single family electrification alterations, with an additional $250 for purchasing a HP dryer and $1,000 for electric infrastructure upgrades. For low-rise

multifamily buildings and ADUs, California Energy-Smart homes offers $2,200 in electrification alterations, with an additional $250 incentive for purchasing a HP dryer and $600 bonus for electric infrastructure upgrades.

Future Funding Opportunities

In addition to the identified federal and state funding sources and tax incentives described above, there may be other funding opportunities that become available after the April 1st deadline for the CPRG implementation grant. Any potential additional funding sources to help fund the Riverside and San Bernardino County Region's municipal and residential LIDAC building decarbonization efforts will be closely monitored. Upcoming funding sources may include the Office of State and Community Energy Programs' (SCEP) Public Sector Funding & Technical Assistance Programs and/or those outlined in the White House BIL and IRA guidebooks.

Goods Movement Decarbonization

Background

Southern California is a major hub for importing and exporting goods, with trillions of dollars in cargo moving across the region each year. Goods movement, defined as the distribution of freight (including raw materials, parts and finished consumer products) by all modes of transportation including marine, air, rail, and truck,[39] encompasses aspects of already existing regional networks such as trucks and trains, as well as their associated infrastructure and facilities. Many of these warehouses and distribution facilities employ heavy- and medium-duty vehicles that contribute to GHG emissions, and thus impact local and regional air pollution. These emissions also disproportionately impact Low-Income and Disadvantaged Communities (LIDACs). Specifically, in the Riverside and San Bernardino County Region, the goods movement infrastructure poses an opportunity for a substantial GHG reduction. The adoption of electric vehicles and other low-emission technologies such as hydrogen fuels would be transformative in reducing GHG emissions. Increasingly, the decarbonization of goods movement in California has been a focal point in local and regional climate action planning, but success in reducing goods movement emissions has been limited due to a lack of ZEV charging and fueling infrastructure, limited availability and affordability of new clean vehicle technologies, and the multijurisdictional nature of goods movement.

This regional measure builds from several measures in WRCOG's Subregional CAP (2022) and SBCOG's Regional GHG Reduction Plan (2021), indicated as follows:

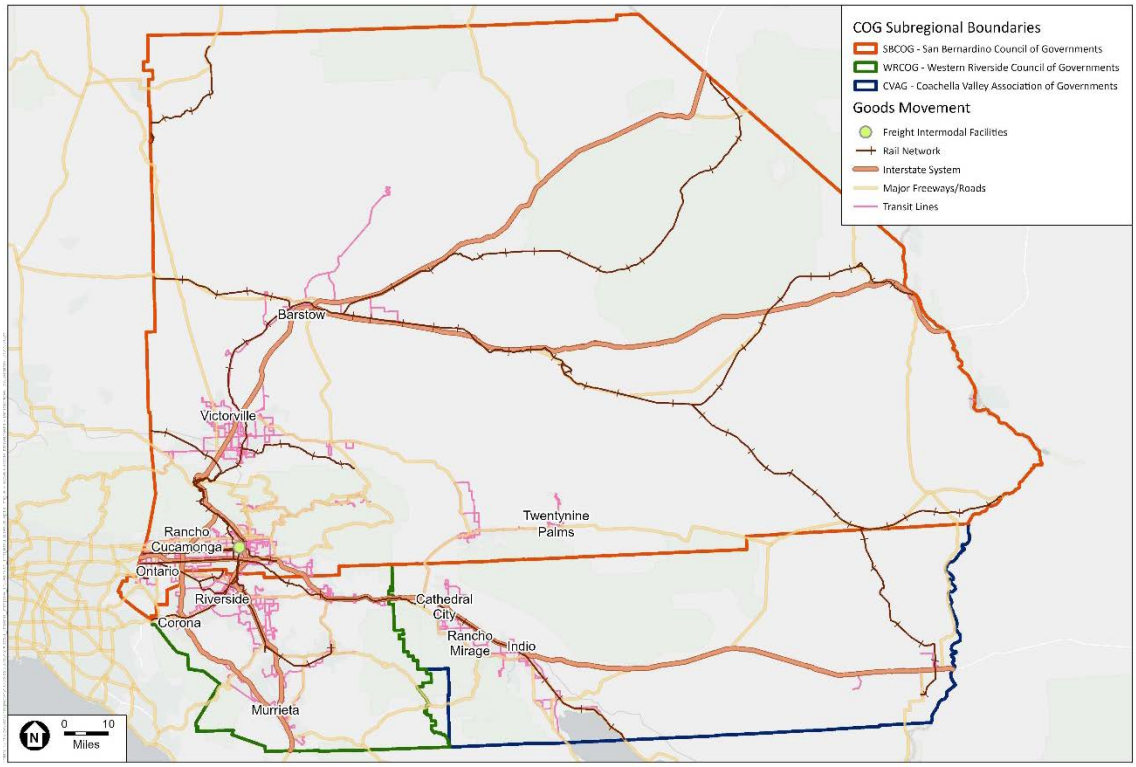
- WRCOG Measure RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives
- WRCOG Measure LT-10: Local ZEV Programs: Infrastructure and Vehicle Purchases
- SBCOG Measure T-5: Community Fleet Electrification

39 Goods movement as defined by the EPA https://www.epa.gov/community-port-collaboration/ports-primer-51-goods-movement-and-transportation-planning#:~:text=Goods%20movement%20Goods%20movement%20The,transportation%20system%20helps%20move%20freight

Figure 4-1 provides a high-level overview of the existing goods movement infrastructure in the Riverside-San Bernardino-Ontario MSA. Through the decarbonization of goods movement infrastructure, the region can reduce GHG emissions and air pollution associated with heavy and medium duty vehicles, trains, and cargo handling, as well as provide environmental, social, and economic benefits to the community.

Several regional initiatives are in development, but funding remains an obstacle to implementation. This includes a planned medium and heavy-duty (MHD) zero-emission vehicle (ZEV) charging complex between Baker and Barstow along Interstate 15, and a similar project in the vicinity of Calimesa. In addition, the region is anticipating an increased demand for sustainably produced hydrogen fuel as the goods movement industry rolls out new hydrogen-powered vehicles, and has several projects in the planning stage, including a hydrogen fueling hub at the San Bernardino airport.

Figure 4-1 Goods Movement Corridors in Riverside-San Bernardino-Ontario MSA



SOURCE: Caltrans, 2024; ESA, 2024.

Description of Regional Measure

Purpose

This measure serves to implement and incentivize decarbonization of goods movement activities through electrification or fuel switching of trucks and cargo-handling equipment fleets. This regional measure addresses the need to transition heavy and medium duty vehicles, as well as cargo handling equipment (i.e. top handlers, cranes, forklifts, terminal tractors, and yard trucks)

from fossil fuels to electric power or hydrogen fuel. Funding to implement this measure will support the deployment of hydrogen filling stations and multi-megawatt electric charging at truck stops, incentives for private fleet vehicle electrification, and mechanisms to electrify cargo handling equipment.

Goal & Purpose

To reduce GHG emissions associated with goods movement in Riverside and San Bernardino Counties, including freight transport by medium and heavy-duty vehicles and cargo handling at warehouses and logistics centers.

Scope of Potential Activities Under This Measure

- EV Charging systems at goods movement facilities:
  - Combined charging systems: DC fast charging (DCFC) systems with a combined charging cable type. Combined charging systems are compatible with almost all LD and MHD ZEVs on the market today (with the major exception of Tesla vehicles, unless a personal adaptor is used). Combined charging systems range from 50kW−350kW, depending on the system and use needs.
  - Megawatt charging systems – developing technology that will provide fast charging for class 6, 7, and 8 commercial vehicles (MHD trucks), including goods movement long haul trucks that frequent the highway corridors of the region. These systems can charge a single vehicle with the maximum system power output or multiple vehicles at once, with the system's power divided among the users.
- Hydrogen fueling stations at goods movement facilities
- Purchase of goods movement ZEVs
  - Funding of incentive programs for fleet electrification
- Pilot vehicle & equipment studies for electric and hydrogen vehicle technology implementation
- Electrification of warehouse cargo-handling equipment
- Zero emission offroad equipment, including locomotives and switchers
- Energy storage and grid resilience
  - Commercial solar and battery storage expansion
- First mile/last mile improvements
  - Address barriers impeding the transformation of the last mile freight market

Participants (Implementing Parties)

For the regional goods movement measure, participants may include the following:

- Lead Agency Partners: Councils of Governments, County Transit Authorities/County Transportation Councils, Mojave Desert Air Quality Management District (MDAQMD), and South Coast Air Quality Management District (SCAQMD)
- Trucking companies
- Freight companies

- Gas stations and truck stops
- Cargo and loading docks
- Warehouses and distribution centers
- Utility Partners
- Electric vehicle charging equipment provider
- Hydrogen fueling station equipment provider
- Installation and maintenance provider

Stakeholder & Site Considerations

The success of this regional measure will hinge on the collaboration of multiple stakeholders, including South Coast Air Quality Management District (SCAQMD) and Mojave Desert Air Quality Management District (MDAQMD). With the multijurisdictional nature of goods movement, particularly across public and private sectors, the optimal and equitable distribution of funds is a necessary consideration. In addition, the role(s) of public/private subcontractors must also be considered, as this regional measure potentially carries an economic advantage to regional implementation. In addition, the differences in costs, benefits, and feasibility for deployment of electric versus hydrogen technology must also be considered.

Authority to Implement

Agencies with the authority to implement this regional measure include the South Coast Air Quality Management District (SCAQMD) and Mojave Desert Air Quality Management District (MDAQMD), which are regulatory agencies established and governed by the California Health and Safety Code, particularly Division 26, Part 3, Sections 40400 et seq. Additional regulatory and/or statutory authorities that may be needed to implement this measure are described, by agency, in Appendix C.

GHG Reduction and Cost Metrics

GHG reduction estimates will be based on analysis of equipment and type of system installed.

- $MTCO_2e$ reduction per vehicle, charging station, and/or type of cargo handling equipment;
- $MTCO_2e$ reduction per DCFC installed for commercial MHD & LD ZEVs in combined charging systems;
- $MTCO_2e$ per high-power, high-efficiency charger for commercial MHD EVs in megawatt charging systems.

Example Project for Implementation

The Barstow – Baker ZEV Truck Charging Infrastructure project will deploy two (2) medium and heavy-duty (MHD) zero-emission vehicle (ZEV) charging complexes between Barstow and Baker within MDAQMD's jurisdiction and along Interstate 15 that will deploy 60 high-power, high-efficiency chargers in total through three (3) project phases. Of the proposed charging stations included in the project, 52 are designed to meet commercial MHD demand that will

rapidly grow in Southern California and the remaining eight (8) will support light-duty (LD) and passenger vehicle demand.

GHG Reductions and Cost-benefit Assessment

The following GHG reduction and cost estimates are based on a preliminary design study provided to MDAQMD regarding the project.

- Total GHG estimate for 5-year period (Q1–2025 through Q4 2029): 77,182 short tons = 70,019 $MTCO_2e$
- Estimated cost (rough order of magnitude) $48.9M
- Cost per $MTCO_2e$ reduced = $698

Implementing Schedule and Milestones

Specific program details are not yet available for this project.

Summary of Implementation Grant Suitability

- Addresses one of the region's highest emitting sectors with direct reduction in GHG emissions and air pollutants from medium/heavy duty transportation.
- Transformative: the Riverside and San Bernardino County Region has extensive distribution centers and economically is one of the most important goods movement regions in the US.
- Scores high on grant scoring criteria: LIDAC & AQ co-benefits, GHG reduction, transformative measure, need for funding.
- Conducive to coalition of two or more applicants (e.g.., LA/OC MSA, South Coast AQMD, CARB)
- Measure could be multifaceted by incorporating EV and hydrogen infrastructure; pilot vehicle & equipment studies; energy storage and grid resilience.
- Could potentially leverage new ARCHES hydrogen infrastructure award for the region.

LIDAC Benefits

Goods movement is a significant and key marker of Southern California's economy. However, goods movement corridors often traverse LIDAC communities, affecting local and regional air quality and posing significant exposure and risk to public health. Decarbonizing goods movement involves vehicle electrification and a transition to cleaner fuels, which reduces air pollution and leads to improved public health outcomes and reduced healthcare costs for individuals within LIDACs. Moreover, the transition to decarbonized goods movement holds the potential to mitigate noise pollution, fostering a quieter and more pleasant living environment for nearby residents. Ultimately, these co-benefits contribute to the creation of healthier and more resilient communities. A detailed analysis of the region's LIDACs, their climate change vulnerabilities, and the co-benefits expected from implementation of this regional measure is included in *Chapter 5 – LIDAC and Co-benefits Analysis*.

Existing Funding Sources

Last Mile Freight Program

SCAG has partnered with the Mobile Source Air Pollution Reduction Review Committee (MSRC) to establish Program Guidelines and issue a Call for Projects for the Last Mile Freight Program (LMFP). The LMFP is a component of a larger goods movement emission reduction effort established by the MSRC. Last mile freight activity is a critical component of supply chains for both consumers and intermediary businesses dealing with physical goods. E-commerce has had a profound impact on last mile delivery growth, and in 2020, the COVID-19 pandemic has only exacerbated the frequency of deliveries adding further stress to global supply chains. At the same time, air quality challenges continue to impact the public health of the region.

As part of SCAG's Connect SoCal plan (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), the Accelerated Electrification strategy is a Key Connection of the Plan seeking to de-carbonize or electrify vehicles including those within goods movement. The LMFP serves as an initial step towards implementing freight-related clean vehicles/equipment and infrastructure to support cleaner air goals. SCAG has developed a two-phased approach for the LMFP. The first Phase, happening now, focuses on the commercial deployment of zero-emission or near-zero emission (ZE/NZE) heavy and/or medium duty on road trucks (including ZE/NZE equipment and supporting infrastructure). A total of $16,751,000 is available for Phase 1 of the LMFP.[40]

Goods Movement Emission Reduction Program (PROP 1B)

The Goods Movement Emission Reduction Program (Prop 1B) is a partnership between the California Air Resources Board (CARB) and local agencies (like air districts and seaports) to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. Projects funded under this program must achieve early or extra emission reductions not otherwise required by law or regulation. Funds are currently available through participating air districts for heavy-duty truck replacement or repower and Transportation Refrigeration Unit (TRU) replacement. Infrastructure projects supporting replacement trucks and/or TRUs utilizing advanced technologies are also eligible.[41]

ARCHES Hydrogen Infrastructure

The Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) is a public-private partnership program funded by the U.S. Department of Energy to accelerate the development and deployment of clean renewable hydrogen. ARCHES was created to facilitate California's transition to renewable, clean hydrogen (H2) energy while prioritizing environmental justice, equity, economic leadership, and workforce development. ARCHES is the result of an unprecedented collaboration between state government, higher education, labor and an environmental NGO based upon a shared belief in the benefits that hydrogen brings to California

40 More information on this program can be found here: https://scag.ca.gov/LMFP

41 More information on Prop 1B can be found here: https://ww2.arb.ca.gov/our-work/programs/truckstop-resources/truckstop/financial-assistance/goods-movement-emission#:~:text=The%20Goods%20Movement%20Emission%20Reduction,movement%20along%20California's%20trade%20corridors

and its communities, including cleaner air, lower GHG emissions, greater energy security, and greater economic and workforce prosperity. Under this program, California will receive up to $1.2 billion for the implementation of California's Hydrogen Hub.[42] The California Hydrogen Hub aims to accelerate the adoption of hydrogen as a clean source of energy. The Hub will serve as a critical component of the state's decarbonization goals, especially in hard-to-abate sectors such as public transportation, heavy duty trucking, and port operations. By establishing a robust hydrogen market and ecosystem, California will support the growth of hydrogen-powered vehicles, fuel cells, and other applications, and foster a more sustainable and resilient energy future.

42 More information about the ARCHES program can be found here: https://archesh2.org/about/

WRCOG Measures

The GHG reduction measures appropriate for the WRCOG region are described below and summarized in **Table 4-21**. Measures are organized based on the structure of WRCOG's 2022 Subregional CAP, which includes the sectors of Energy, Transportation, Solid Waste, Water & Wastewater, and Agriculture, and categorized as state, regional, and local measures based on their authority to implement. As described in the previous chapter, the seven existing local CAPs in the WRCOG subregion were reviewed for consistency with the 2022 Subregional CAP, and through that process it was determined that the following measures should be added to the PCAP to account for the local CAPs and more thoroughly represent the range of GHG measures appropriate for the subregion:

1. LE7: Cool Roofs and Pavements
2. LE8: Reach Codes for New Buildings – Going Beyond Title 24
3. LT12: Congestion Pricing/Express Lanes

Table 4-21
PCAP Measures – WRCOG Subregion

ID	PCAP Measure	Sources (see Key below)	Reduction Potential by 2030: ($MTCO_2e$ per year)	
			2022 WRCOG Subregional CAP	Other Local Government CAPs
Energy				
SE-1	Renewables Portfolio Standard (RPS) – 2030	1,3,5,6,8	475,686	685,728
SE-2	Title 24 Building Energy Standards (2016 or later)	1,3,4,5,6,8	69,799	24,164
Transportation				
ST-1	Pavley, Advanced Clean Cars, & LCFS	1,3,4,5,6,7,8	497,709	2,733,595
Solid Waste				
SR-1	Recycling and Waste Diversion Mandates	1,6	157,391	96,695
Water and Wastewater				
SW-1	Water Conservation Mandates	1,6	8,450	7,360
Regional Measures				
Transportation				
RT-1	Metrolink Expansion	1,7	1,834	11,289
RT-2	Transportation Demand Management	1,5,6,7	25,110	131,883
RT-3	Regional Zero Emission Vehicle (ZEV) Initiatives	1,7,8	73,662	324,886

Table 4-21
PCAP Measures – WRCOG Subregion

ID	PCAP Measure	Sources (see Key below)	Reduction Potential by 2030: ($MTCO_2e$ per year)	
			2022 WRCOG Subregional CAP	Other Local Government CAPs
Local Measures				
Energy				
LE-1	Expand Local Renewable Energy Production & Storage	1,3,5,6,7,8	53,947	78,638
LE-2	Community Choice Energy/Green Grid Offerings	1,3,6,7,8	142,846	851,406
LE-3	Improve Energy Efficiency of Existing Buildings	1,3,5,6,7,8	16,528	451,220
LE-4	Building and Appliance Electrification	1,5,6	2,146	37,849
LE-5	Traffic & Street Light Upgrades	1,5,7,8	3,641	6,352
LE-6	Shade Trees	1,3,6,7,8	NQ	7,155
LE-7	Cool Roofs and Pavements	2,3,4,5,8	NA	27,863
LE-8	Reach Codes for New Buildings – Going Beyond Title 24	5,6	NA	107,145
Transportation				
LT-1	Bicycle Infrastructure Improvements	1,3,5,6,7,8	4,139	204,852
LT-2	Pedestrian Infrastructure Improvements	1,3,5,6,7,8	11,637	2,306
LT-3	Carshare & Carpool Programs	1,5,6,7,8	1,053	223,245
LT-4	Parking Pricing and Limited Requirements	1,3,6,8	11,520	24,757
LT-5	Increase Transit Service and Frequency	1,5,6,7	947	31,795
LT-6	Traffic Signal Coordination and Calming Measures	1,6,7	2,332	69,967
LT-7	Increase Housing Density	1,5,6,7	NQ	12,260
LT-8	Increase Land Use Diversity	1,5,6	NQ	1,153
LT-9	Transit Oriented Development	1,5,6,7,8	2,050	88,705
LT-10	Local ZEV Programs: Infrastructure and Vehicle Purchases	1,5,6,7	1,954	167,615
LT-11	Subsidized Transit	1,6,7	3,194	4,951
LT-12	Congestion Pricing/Express Lanes	7	0	31,367
Solid Waste				
LR-1	Zero Waste Initiatives (exceed state mandates)	1,3,6,7,8	NQ	30,717

Table 4-21
PCAP Measures – WRCOG Subregion

ID	PCAP Measure	Sources (see Key below)	Reduction Potential by 2030: ($MTCO_2e$ per year)	
			2022 WRCOG Subregional CAP	Other Local Government CAPs
Water				
LW-1	Increase Recycled Water Use	1,3,5	NQ	1,529
Agriculture				
LA-1	Local Agriculture/Community Gardens	1,7	NQ	0
Total Reductions from Existing CAPs			**1,567,575**	**6,478,447**

KEY:
1 – WRCOG Subregional CAP (2022)
2 – City of Beaumont CAP (2015)
3 – City of Corona CAP Update (2019)
4 – City of Lake Elsinore CAP (2011)
5 – City of Moreno Valley Draft CAP (2021)
6 – City of Murrieta CAP Update (2020)
7 – City of Riverside CAP (2016)
8 – County of Riverside CAP (2019)
NA – Not included in 2022 WRCOG Subregional CAP
NQ – not quantified in 2022 WRCOG Subregional CAP

In some cases, the measures in WRCOG's 2022 Subregional CAP have been adjusted or amended with additional actions to more fully represent the range of similar measures found in other local CAPs, for the purpose of regionally consolidating GHG reduction estimates. Table 4-21 summarizes the annual GHG reduction estimates from the 2022 WRCOG Subregional CAP and the seven local CAPs, for the year 2030.[43]

The methods used to estimate GHG emission reductions from the measures listed in Table 4-21 for the 2022 WRCOG Subregional CAP can be found in Appendix D of that document (Greenhouse Gas Quantification Methods). Methods used to quantify the GHG reduction measures in the seven local CAPs are provided in those documents.

State Measures

Emissions reductions at the state level are primarily achieved through regulations, such as efficiency standards for passenger vehicles, reduction in carbon content of transportation fuels, and minimum renewable energy supply requirements for utilities. In addition, California's regulations mandate water conservation and waste diversion from landfills.

Measures regulated and implemented by the state and federal government achieve reductions without additional action by local communities. That is, even if vehicle miles traveled (VMT) within the subregion remains constant over time, resulting GHG emissions would decrease

43 Note that the GHG reduction figures in Table 4-21 represent 2035 estimates for City of Riverside and 2040 estimates for City of Moreno Valley, since 2030 estimates were not provided in those CAPs.

because as new vehicles are purchased, they would in general be more GHG-efficient than those they replace.

State and federal programs typically require action at the local level in order to be successful. For example, the California Green Building Standards Code (CALGreen and the Title 24, Part 6 energy standards) requires, at a minimum, that new buildings and renovations in California meet certain design standards. New residential and commercial buildings must meet certain baseline efficiency and sustainability standards. These baselines are established through locally adopted building codes and will result in GHG reductions. Additional voluntary building code provisions, known as CALGreen Tier 1 and Tier 2 requirements, can be adopted locally, providing even greater energy savings and emissions reductions.

SE-1: Renewables Portfolio Standard

Mandates for utilities to source their power from renewable sources.

Through a series of increasingly stringent bills first enacted in 2002, California has placed requirements on electric utilities to procure a portion of their energy from renewable sources. The standard, known as the Renewables Portfolio Standard (RPS), applies to investor-owned utilities, publicly owned utilities, electricity service providers, and community choice aggregators. Therefore, all electricity-providing utilities servicing Western Riverside County (including Southern California Edison as well as municipally owned utilities) must meet these targets:

1. 33 percent of retail sales from renewables by 2020
2. 44 percent of retail sales from renewables by 2024
3. 52 percent of retail sales from renewables by 2027
4. 60 percent of retail sales from renewables by 2030
5. 100 percent of retail sales from renewables by 2045

Meeting these goals will lead to reduced GHG emissions associated with electricity, as more electricity will be generated by sources with zero or lower carbon intensity.

Table 4-21 summarizes the 2030 GHG reductions from the RPS are presented in the 2022 WRCOG Subregional CAP and in the subregion's local CAPs. Under Measure SE-1, the 2022 WRCOG Subregional CAP accounted for a RPS of 60 percent renewables by 2030. Regarding existing local CAPs in the WRCOG subregion, only the 2019 County of Riverside CAP accounted for the same level of GHG reduction from the RPS, while the CAPs for the cities of Corona and Moreno Valley assumed 50 percent renewables by 2030. The other local CAPs assumed just 33 percent renewables by 2020, since they were completed prior to more stringent RPS requirements being established by the state.

SE-2: California Building Energy Efficiency Standards (Title 24, Part 6)

Comply with California's mandatory building energy efficiency standards.

Building energy efficiency standards are designed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. California's building energy efficiency standards (Title 24, Part 6) are listed in the California Code of Regulations. These standards began in 1978 and are updated every 3 years, generally becoming more stringent with respect to efficiency requirements. They are generally enforced through locally adopted building codes and inspection processes. The Title 24 standards are expected to implement the goals of the California Energy Efficiency Strategic Plan, to achieve zero net energy (ZNE) performance for all new low-rise homes constructed after 2020, and for all new commercial buildings constructed in or after 2030. The latest adopted standards (2022), which became effective January 1, 2023, reduce energy use in new single family, multifamily, and nonresidential buildings. They encourage installation of efficient electric heat pumps, establish electric-ready requirements for new homes, expand solar photovoltaic and battery storage standards, and update efficiency measures for lighting, building envelopes, and HVAC systems.

Under Measure SE-2, the 2022 WRCOG Subregional CAP accounted for anticipated future updates to Title 24. Regarding existing local CAPs in the WRCOG subregion, Moreno Valley accounted for efficiencies associated with the 2019 version of Title 24, while the cities of Corona, Lake Elsinore and the County of Riverside accounted for the 2016 version of Title 24. Other local CAPs accounted for earlier versions of Title 24, which included energy efficiency standards that are now outdated and would have no effect on reducing WRCOG's forecasted emissions.

ST-1: Pavley and Low Carbon Fuel Standard

Comply with state requirements to decarbonize passenger vehicles.

In 2002, California adopted AB 1493, referred to as "Pavley 1," which directed CARB to develop fuel-efficiency standards for passenger vehicles in California by 2005. Through a series of rulings, CARB and the federal government agreed on federal standards that began in 2009 and increased through 2016. In January 2012, CARB approved the Advanced Clean Cars Program, an emissions control program for model year 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Building from Pavley 1, Executive Order S-1-07, known as the Low Carbon Fuel Standard (LCFS), required the carbon-intensity of California's transportation fuel to be reduced by at least 10 percent by 2020. In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the program, including a doubling of the carbon intensity reduction target to 20 percent by 2030.

The Advanced Clean Cars II program, passed in 2022, requires that by 2035 all new passenger cars, trucks, and SUVs sold in California will produce zero emissions. It amends the Zero-

Emission Vehicle Regulation to require an increasing number of ZEVs, and relies on advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric, and plug-in hybrid EVs to meet air quality and climate change emissions standards. It also amends the Low-Emission Vehicle Regulations to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions while the sector transitions toward 100 percent electrification by 2035.

SR-1: Recycling and Waste Diversion Mandates

Meet or exceed state mandates to divert organics and solid waste from the landfill waste stream.

Recycling or reusing materials rather disposing them in landfills reduces GHG emissions in several ways: using recycled materials rather than raw materials reduces the need to harvest and transport new raw construction materials, as recycled materials can be locally repurposed and reused; products that are repaired or reused, or designed to last longer, avoid the emissions associated with the harvesting of virgin materials and manufacturing of new products; composting organic waste keeps it from decomposing anaerobically in landfills to create methane, and compost helps build healthy soil and plants, which in turn serve as reservoirs for carbon that would otherwise result in GHG emissions released into the atmosphere.

Several regulations are in place that help to reduce GHG emissions associated with solid waste.

- SB 1383 sets a statewide goal to divert at least 75 percent of organic waste from landfills by 2025, including the recovery of 20 percent of edible food waste for human consumption.
- AB 341 established a statewide goal of 75 percent recycling through source reduction, recycling, and composting by 2020, and requires commercial businesses, multi-family dwellings with 5 or more units, and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place.
- AB 1826 requires businesses and multi-family complexes that generate 2 or more cubic yards of solid waste, recycling, and organic waste combined per week to arrange for organics collection services. This includes schools, hospitals, stores, restaurants, for-profit or nonprofit organizations, as well as residential dwellings with 5+ units.
- CALGreen, the state's Green Building Standards Code, requires jurisdictions to divert a minimum of 65 percent of the construction waste generated during most new construction projects.

Local haulers and the agencies they serve support these policies through pricing structures that incentive recycling and waste diversion, organics diversion outreach, lumber scrap diversion ordinances and outreach, yard and food waste collection, landfill methane capture, and food waste biodigestion programs.

SW-1: Water Conservation Mandates

Meet or exceed state requirements to reduce urban per capita water use.

In Southern California, energy costs and GHG emissions associated with the transport, treatment, and delivery of water from outlying regions are high, providing the region with an extra incentive

to reduce water consumption. While water conservation is accounted for as a state measure, it will be up to local water retailers, local governments, and water users to meet these targets.

California Assembly Bill 1668 and Senate Bill 606, passed after the drought of 2012–2017, require urban and agricultural water suppliers to enact new urban efficiency standards for indoor use, outdoor use, and water lost to leaks. These laws apply to water agencies operating in Western Riverside County, including Eastern Municipal Water District (EMWD), Western Municipal Water District (WMWD), Elsinore Valley Municipal Water District, Jurupa Community Services District, Rancho California Water District, Riverside Public Utilities, and the City of Corona. The indoor water use standard, set by the State Water Resources Control Board (SWRCB), is 55 gallons per person per day (GPCD) until January 2025, decreasing to 50 GPCD in January 2030. An outdoor water use standard was expected to be adopted by June 2022. The standards are not enforceable on individual water users; water agencies must meet them by averaging across all their customers.

Regional Urban Water Management Plans provide strategies and create incentives to achieve these targets through regional and local action. Many water retailers offer resources that incentivize purchase of high-efficiency appliances and provide information on best management practices, landscaping, and the use of recycled and gray water systems. Local participation is necessary to realize water use reductions and end-user implementation strategies typically include water conservation education; tiered pricing (i.e., pricing water according to the amount consumed); water-efficient landscape requirements for water, irrigation management. and plant selection; and incentives where some utilities pay for turf grass removal and replacement with efficiently irrigated landscaping. Some jurisdictions have adopted ordinances requiring the installation of certain water conservation measures at properties before selling or renovating properties. Others are seeking to expand recycled water deliveries and promote rainwater collection or graywater system use.

Regional Transportation Measures

Regional programs are those developed or administered at a level of government above the local jurisdiction but below the state. These programs often are more responsive to local context than statewide programs. They require local participation but do not require local administration to achieve GHG reductions.

For example, WRCOG administers the Transportation Uniform Mitigation Fee (TUMF) Program. The TUMF Program establishes a funding source to mitigate the cumulative regional transportation impacts of new development on regional arterials. TUMF fees are collected at the local jurisdiction, and WRCOG works with its member jurisdictions to identify priority projects to fund using fee revenues in order to reduce transportation impacts caused by development. Facilitating movement on roads, by encouraging non-motorized transportation, increasing access to transit, or easing congestion on critical roadways may lead to GHG reductions. Therefore, TUMF can fund projects that meet this objective. Because the project relies on locally collected fees, available funding depends on the economic vitality and development opportunities in the WRCOG subregion.

A number of other transportation-related programs and projects under the primary control of the Riverside Transit Agency (RTA), Riverside County Transportation Commission (RCTC), California Department of Transportation (Caltrans), and other transportation entities can be implemented to reduce GHG emissions. The long-term planning of major transportation infrastructure is not under the participating jurisdictions' direct control; however, jurisdictions participate in subregional transportation planning decisions in a way that benefits the subregion. Local jurisdictions are in direct control of land uses, which can dictate how future transit is shaped. Individuals also play an important role in how they choose to move throughout the subregion; therefore, while individual jurisdictions do not implement these programs, local input is critical to the success of these programs. Additional projects anticipated to result in GHG reductions include Metrolink expansion, express lanes, congestion pricing, goods movement, high frequency transit service, California High Speed Rail, and electric vehicle infrastructure implementation.

WRCOG has also explored a VMT mitigation exchange, where VMT generators can select from a pre-approved list of mitigation projects that may be located within the same jurisdiction or possibly from a larger area. The intent is to match a project's needed VMT reduction with a specific mitigation project of matching size and to provide evidence that the VMT reduction will reasonably occur. Initially, this project would focus on implementing a transit pass subsidy program to initiate the exchange, but could be expanded out to include active transportation projects and land banking programs (for land in high VMT areas) that would assist in reducing VMT.

RT-1: Metrolink Expansion

Additional Metrolink transit service provided to Western Riverside County.

As identified in Metrolink's 10 Year Strategic Plan, service on the Metrolink Perris Valley Line will be increased in Western Riverside County, allowing for alternative transportation, reducing VMT and GHG emissions in Western Riverside County. Service along this route is expected to increase to 23 trains per weekday by 2025.

Metrolink has projected that travelers from the Perris Valley corridor will represent a growing share of Metrolink trips at all Riverside County stations, from approximately 3,000 in 2001 to about 11,700 in 2030 (a 390 percent increase). This increase in ridership will provide an alternative to single-occupancy vehicles, which in turn will reduce the GHG emissions of the WRCOG subregion.

Table 4-21 summarizes the 2030 GHG reductions expected from the MetroLink expansion for the cities that participated in WRCOG's 2022 Subregional CAP as well as expected reductions estimated by the City of Riverside in their local CAP.

RT-2: Transportation Demand Management

Implement transportation demand management strategies and programs such as commuter benefit programs and promoting telecommuting and alternative work schedule options.

This strategy reflects the regional share of transportation demand management (TDM) strategies that may be implemented on a regional level given the high degree of out-commuting that occurs in Western Riverside County. Telecommuting, which has increased considerably over the past decade and particularly since the Covid-19 pandemic, reduces GHG emissions directly by removing vehicle trips, and provides the added benefit of reducing idling and congestion-related emissions from the vehicles remaining on the road.

Between 2017 and 2020, telecommuting dramatically increased in the WRCOG subregion, primarily as a reaction to the COVID-19 pandemic. Regional telecommuting has not remained at the level experienced during the pandemic but is now seen as a more viable option for some workers in the WRCOG subregion than it was before 2020. It is expected that regionally, telecommuting will increase to higher levels by 2030 compared to 2017. The subregion's IE Commuter program, a partnership between Riverside County Transportation Commission (RCTC) and SBCTA provides support, resources and incentives to individuals and employers for telework programs. With teleworking becoming increasingly viable for companies and for workers, this program is likely to expand, and other programs in the subregion may also develop.

Table 4-21 summarizes the 2030 GHG reductions expected from transportation demand management programs for the cities that participated in WRCOG's 2022 Subregional CAP as well as additional reductions estimated by the cities of Moreno Valley, Murrieta and Riverside in their local CAPs.

RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives

Facilitate regional efforts to expand electric and hydrogen-powered vehicle adoption.

Zero-emissions vehicles (ZEVs) include plug-in battery vehicles (PEVs) and hydrogen fuel cell vehicles (FCEVs). The availability of new vehicle models, improved battery storage, and increased availability of vehicle charging infrastructure, coupled with incentives such as carpool lane access stickers, federal tax credits, and state and air district rebates have contributed to an expanding market for ZEVs.

Regional efforts to accelerate the adoption of electric and hydrogen powered vehicles can be supporting by implementing the following actions:

- Provide publicly accessible infrastructure, including electric vehicle charging stations and hydrogen fueling stations.
- Create Federal Alternative Fuel Corridors along major highways that help attract investment in ZEV charging infrastructure.
- Develop ZEV guidebooks and best practices manuals for local agencies to improve awareness and knowledge.

- Provide and maintain online EV and hydrogen fuel station locator maps to the public.

California leads the nation in transitioning to electric vehicles, accounting for nearly half of the nation's sales in recent years. The state's strong policy framework, combined with availability of rebates, new vehicle models, improved battery storage, and increased availability of vehicle charging infrastructure, have pushed the total ZEV population (battery-electric, plug-in hybrids, and fuel cell electric vehicles) to nearly 2 percent of all vehicles on the road as of 2021, according to the California Energy Commission.[44]

The ZEV transition is expected to accelerate, bolstered by recent legislation (e.g., Advanced Clean Cars II) and Governor Newsom's Executive Order N-79-20 to halt all sales of fossil fueled vehicles by 2035. In addition, the Federal administration is supporting expansion of the electric vehicle charging infrastructure nationwide through various funding programs. Regional plans and policies, such as SCAG's regional plug-in electric vehicle (PEV) readiness plan and WRCOG's subregional plan for PEV readiness will promote improved battery storage. Meanwhile, ZEVs are becoming more affordable and desirable to consumers. The emergence of companies like Tesla are pushing the boundaries of innovation, and some of the largest vehicle manufacturers, including General Motors, Volvo, and Ford, have announced commitments to stop selling fossil fueled vehicles in the coming years.

The Western Riverside County Clean Cities Coalition works with vehicle fleets, fuel providers, community leaders, and other stakeholders to promote advanced vehicle technologies in transportation and to develop the tools and infrastructure needed to expand the use of ZEVs. The Coalition is part of the national Clean Cities network, administered by the U.S. Department of Energy. According to data collected by the Coalition and the California Energy Commission (CEC), the uptake of ZEVs in Riverside County exceeds the statewide average.

Table 4-21 summarizes the 2030 GHG reductions expected from regional ZEV infrastructure expansion for the cities that participated in WRCOG's 2022 Subregional CAP as well as additional reductions estimated by the City and County of Riverside in their local CAPs.

44 CEC, 2021. Zero Emission Vehicle and Infrastructure Statistics. Available at: https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics

Zero-Emissions Trucks

Southern California is a major hub for goods movement, an essential part of the regional and state economies. In Western Riverside County, where many large warehouses and distribution facilities are located, the trucks that move these goods contribute large quantities of GHG emissions. The state, along with SCAG and South Coast AQMD, is addressing this challenge through various plans, programs and mandates that are supporting greater penetration of zero- and low-emission trucks in the region.

In June 2020, CARB passed its Advanced Clean Trucks (ACT) Regulation to transition trucks from diesel to electric over the next two decades. Between 2024 and 2035, the Advanced Clean Trucks Program will transition 75 percent of delivery trucks and vans, 55 percent of smaller trucks like the Ford F250, and 40 percent of the larger, semi tractors sold in the state to zero emission trucks. By 2045 every new truck sold in California will be zero-emission.

In July 2020, 15 states and Washington, D.C., signed a memorandum of understanding to work toward a goal of 100 percent of medium- and heavy-duty zero-emissions vehicle sales by 2050.

With goods movement expected to be a major component of the region's economy for the foreseeable future, these initiatives are vital contributors to the WRCOG Subregion's GHG reduction goals.

Local Measures - Energy

LE-1: Expand Local Renewable Energy Production and Storage

Increase solar PV installations on new and existing buildings in the community.

Develop renewable energy generation systems on city-owned property for use in municipal operations.

Increase local capacity to store electricity.

Increase renewable energy production from wind, biomass, landfill gas, or hydropower projects.

Renewable energy resources—such as solar, wind, biomass, hydropower, and landfill gas—reduce GHG emissions by replacing fossil fuels. Renewables also reduce emissions of conventional air pollutants, such as sulfur dioxide, that result from fossil fuel combustion. In addition, renewable energy can create jobs and open new markets for the local economy, and can be used as a hedge against price fluctuations of fossil fuels. Local governments using renewable energy can demonstrate leadership, helping to spur additional renewable energy investments in their region.

Local governments can promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Southern California Edison) and other private sector funding sources.

In the 2022 WRCOG Subregional CAP, this measure focuses on the installation of distributed, small-scale solar PV systems in existing buildings. PV installations on new buildings are accounted for in State Measure SE-2 (2019 California Building Energy Efficiency Standards). This measure is also included in the local CAPs for the cities of Corona, Moreno Valley, Murrieta and Riverside as well as Riverside County, as accounted for in Table 4-21.

LE-2: Community Choice/Utility Renewable Energy

Create or join a Community Choice Aggregation (CCA) program or create a partnership with SoCal Edison's off-site renewable energy programs (i.e., Green Rate Program), which allows building renters and owners to opt into cleaner electricity sources.

This measure goes beyond state mandates for renewables content of grid electricity. As described in the State Measure SE-1, the Renewables Portfolio Standard (RPS) applies to investor-owned utilities (IOUs), publicly owned utilities (POUs), electricity service providers, and community choice electricity (CCE) programs. To comply with the legislation, utilities and CCE programs in California must procure a minimum of 60 percent of their retail electricity sales from qualifying renewable sources by 2030, and 100 percent by the end of 2045.

Western Community Energy, which for several years operated as the subregion's CCE program, ceased operation in 2021 and is no longer offering renewable electricity to local governments and their community members. However, Southern California Edison (SCE) customers, including those formerly served by WCE, can enroll in SCE's Green Rate program (currently offering 50 percent and 100 percent renewable options) to ensure their electricity comes from renewable sources. Enrollment is voluntary and is done at the individual customer account level. As a conservative approach, potential reductions resulting from participation in SCE's Green Rate program are not quantified as a regional measure.

The City of Banning is served by Banning Electric Utility, a publicly owned utility (POU), which has an 80 percent renewables goal for 2025 and a 100 percent renewables goal for the year 2030.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Murrieta, and Riverside, and the County of Riverside.

LE-3: Improve Energy Efficiency of Existing Buildings

Increase residential and business participation in available energy efficiency programs

Southern California Edison (SCE), Southern California Gas Company (SCG), Riverside Public Utilities (RPU), Moreno Valley Utility, and the Banning Electric Utility provide energy to customers in the subregion. Each utility offers a selection of rebates and other incentives to assist property owners (residential and commercial) with the installation of energy- and water-saving products. The following list provides a sample of the types of programs that are typically available:

- Benchmarking and retrocommissioning
- Direct install energy efficiency programs

- Energy audits at time of property transfer
- Energy efficiency financing and appliance rebate programs
- Education and technical assistance to reduce lighting and plug loads
- Low-income weatherization
- Whole house retrofit program; typically targeting older buildings

Utilities and cities can provide resources, including web-based efficiency calculators, for residents and businesses to analyze their GHG emissions in comparison to their neighborhood, the city, and the region.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Moreno Valley, Murrieta, and Riverside, and the County of Riverside.

LE-4: Building and Appliance Electrification

Transition energy use away from fossil natural gas to clean electricity and renewable natural gas.

Natural gas is used by buildings for space heating, water heating, and cooking (particularly in commercial kitchens). The heating of buildings alone generates 20 to 30 percent of the GHG emissions in California, and the state's long-term for reducing emissions recognizes that the use of natural gas for this purpose must be greatly reduced. This measure focuses on building electrification, but increasingly there may be opportunities for using renewable natural gas (RNG) to replace fossil natural gas. For new buildings and major renovations, cities can require or promote electrification of homes and businesses through its local building code. For existing buildings, cities can promote electrification of household appliances and heating systems through education and financial incentives. SCE offers electrification assistance programs, including their Induction Range Lending Program; their Foodservice Technology Center (FTC) for energy-efficient, electric foodservice equipment; and their appliance rebates.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley and Murrieta.

LE-5: Traffic and Street Light Upgrades

Replace traffic signals and street light fixtures with LEDs or other high efficiency bulbs.

Similar to many household light fixtures, traffic lights have traditionally been illuminated with inefficient incandescent bulbs. Street lights have commonly used high-pressure sodium (HPS) bulbs, which also produce light inefficiently. However, the WRCOG subregion has begun the transition to newer, more efficient lighting technology, such as light-emitting diodes (LEDs), which last significantly longer than traditional incandescent or HPS bulbs, and use much less energy to perform the same task. For well over a decade, WRCOG has had a program in place to help its jurisdictions install LEDs in their traffic signals and upgrade street light fixtures to

accommodate LEDs or other high-efficiency bulbs to lower municipal utility costs and reduce maintenance costs associated with bulb replacement. Many jurisdictions have participated, generally at the 75−100 percent level. As of 2016, over 53,000 lights had been upgraded since the program's inception.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley and Riverside, and the County of Riverside.

LE-6: Shade Trees

Strategically plant trees to reduce the urban heat island effect.

Planting additional trees in urban environments has a number of benefits, including lowering peak-load energy demands during the hottest months, enhancing the visual aesthetic of a community, and naturally sequestering carbon dioxide. Properly selected and located shade trees can help keep indoor temperatures low, thereby reducing air conditioner demands and utility costs. Trees can also provide shade for parking lots and other paved areas, reducing the urban heat island effect communitywide.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Murrieta, and Riverside, and the County of Riverside

LE-7: Cool Roofs and Pavements

Utilize light reflecting surfaces on roofs and pavements for energy savings.

Substituting traditional roofing and pavement surfaces with light-reflective materials has the potential to diminish heat absorption, resulting in a reduction in outside air temperature which can reduce energy loads needed for cooling.

A cool roof is constructed using materials characterized by high thermal emittance and solar reflectance (albedo), aiming to deflect sunlight and associated energy away from a building. These attributes enable roofs to absorb less heat, maintaining much cooler temperatures than conventional materials, particularly during peak summer conditions. Cool roofs can be applied to low-sloped roofs commonly found on commercial, industrial, and office buildings, as well as steep-sloped roofs typical in residences and retail structures.

Cool pavement, on the other hand, is crafted from materials that either reflect more solar energy, promote water evaporation, or have undergone modifications to remain cooler than traditional pavements. This can be achieved through existing paving technologies or innovative methods such as coatings, permeable paving, or grass paving. Cool pavements contribute to energy savings by reducing outside air temperature, enabling air conditioners to cool buildings with greater efficiency, and decreasing the reliance on electric street lighting during nighttime hours.

Local jurisdictions may offer incentives, such as streamlined permitting or bonus density, for new multi-family buildings and re-roofing projects that incorporate "cool" roofs, aligning with the

current California Green Building Code (CALGreen) standards for commercial and industrial buildings.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the cities of Beaumont, Corona, Lake Elsinore, Moreno Valley, and County of Riverside.

LE-8: Reach Codes for New Buildings — Going Beyond Title 24

Adopt a Zero Net Energy standard or reach code with more stringent requirements than Title 24.

A reach code is a local amendment to the California Building Standards Code (Title 24, part 6) that exceeds the minimum requirements for energy performance in building design and construction. Reach codes enable local jurisdictions to get ahead of state regulations and reduce GHG emissions from new buildings and major renovations faster than what would occur from state regulations alone. Reach codes can also function as an effective climate adaptation policy tool that helps communities better prepare for the impacts of climate change by reducing onsite water reuse in drought vulnerable regions, improving building efficiency standards that positively impact air quality.

Increasingly, cities like Murrieta are adopting Zero Net Energy (ZNE) standards ahead of Title 24 regulations, including high-efficiency standards for heating, ventilation, and air conditioning (HVAC) systems, higher insulation standards, and the use of energy-efficient windows with low U-values and high solar heat gain coefficients to promote natural light while minimizing heat transfer. Many cities across California are passing ZNE standards or reach codes aimed at reducing or even banning the use of natural gas and requiring the electrification of heating and cooling systems and appliances.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the cities of Moreno Valley and Murrieta.

Local Measures - Transportation

LT-1: Bicycle Infrastructure Improvements

Expand on-street and off-street bicycle infrastructure, including bicycle lanes and bicycle trails.

By providing more bicycle lanes and better connections between existing bicycle lanes, participating jurisdictions can increase the viability of bicycling as an emission-free commute option. Several WRCOG jurisdictions have adopted or are preparing bicycle master plans, active transportation plans, or safe routes to school plans that incorporate these elements, as well as bike share programs and the expansion of supporting facilities such as bike parking and end of trip facilities such as showers, changing rooms, and lockers. Implementing these plans will increase alternative transportation options in the subregion and can reduce vehicle miles traveled and congestion for vehicles. Community health benefits from increased bicycling include improved air quality and exercise.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Moreno Valley, Murrieta, and Riverside, and the County of Riverside.

LT-2: Pedestrian Infrastructure Improvements

Expand and improve pedestrian infrastructure, including sidewalks, crosswalks, and pedestrian signals, through implementation of an Active Transportation Plan, Safe Routes to School Plan and/or similar plan.

As with bicycle infrastructure, developing pedestrian-oriented plans will provide the template for high-quality pedestrian infrastructure to local jurisdictions. The planning process will allow jurisdictions to refine improvements to meet the needs and address the context of their communities, and should incorporate best practices for bike facility design, identify the location and prioritization of improvements, discuss funding sources.

Through implementation of the plans, construct sidewalks, crosswalks, curb ramps, pedestrian signals, or pedestrian crossings, and create pedestrian only spaces within public areas.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Moreno Valley, Murrieta, and Riverside, and the County of Riverside.

LT-3: Car Share and Carpool Programs

Provide access to car-share and carpool programs to reduce dependence on single-occupancy vehicles.

Access to car share and carpool programs provides an alternative to owning a vehicle or driving a single-occupancy vehicle for some trip purposes. This measure can be particularly effective on college, hospital, or large office campuses and complements transit-oriented development. Programs for as-needed shared vehicle sharing and carpool programs can be provided by private institutions or companies as a service to employees, residents, or students.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley, Murrieta, and Riverside, and the County of Riverside.

LT-4: Parking Pricing and Limited Requirements

Price public parking in central business districts/employments centers/retail centers; Amend zoning codes to reduce requirements for vehicle parking in new development projects.

Limiting parking requirements for new development in certain areas may encourage alternative individual transportation choices, but caution should be taken to minimize the resulting incentive to travel to more distant locations with plenty of parking. This can be accomplished by:

- Eliminating (or reducing) minimum parking requirements;

- Creating maximum parking requirements; and
- Implementing shared parking.

Limiting parking requirements would encourage modes of transportation other than single-occupancy vehicles, thereby reducing VMT and GHG emissions. If these alternative transportation modes include walking and biking, mobility and health benefits can also be realized.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona and Murrieta and the County of Riverside.

LT-5: Increase Transit Service and Frequency

Collaborate with regional transit providers to increase transit service and frequency provided in the subregion.

Collaborate with local and regional transit providers to increase volume and frequency of transit service in the subregion, including more implementation of bus rapid transit (BRT). Local jurisdictions should coordinate with the local and regional transit providers during major planning efforts and project approvals and should provide and condition local infrastructure such as bus pull-outs where appropriate. Cities can also encourage the use of transit by providing or improving bus shelters, and by providing real time schedules that make it easier and more efficient for riders to use transit services.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley, Murrieta, and Riverside.

LT-6: Traffic Signal Coordination and Calming Measures

Incorporate technology to synchronize and coordinate traffic signals along local arterials.

Implement traffic calming measures that slow vehicle speeds and increase safety for cyclists and pedestrians.

Traffic signal coordination describes a method of timing groups of traffic signals along an arterial to provide smooth movement of traffic with minimal stops. This technique reduces motorist stops and delays, lowers the amount of fuel needed to move a certain distance, and reduces GHG emissions. Signal coordination also lessens congestion and resulting tail pipe emissions, which reduces GHG emissions and improves air quality.

The Institute of Transportation Engineers defines traffic calming as the combination of measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users. Traffic calming consists of physical design and other measures put in place on existing roads to reduce vehicle speeds and improve safety for pedestrians and cyclists. Examples include vertical deflections (speed humps, speed tables, and raised intersections), horizontal shifts, roadway narrowing, and median barriers to reduce cut-

through traffic. Traffic calming measures can be implemented at an intersection, street, neighborhood, or area-wide level.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Murrieta and Riverside.

LT-7: Increase Housing Density

Increase the density of planned housing units within the city.

The addition of housing generally results in a net increase in vehicle trips and total transportation emissions for a city. To help attenuate this increase, planners should focus on providing higher density and infill housing in VMT-efficient locations, such as mixed-use specific plan areas, downtowns, and high-quality transit areas in order to reduce daily household VMT. Most participating jurisdictions have identified portions of their communities where future higher-density development is desirable. This measure complements Local Measures LT-7 and LT-8 that promote land use diversity and transit-oriented development.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley, Murrieta, and Riverside.

LT-8: Increase Land Use Diversity

Provide for a variety of development types and uses.

This measure focuses on improving the jobs-housing balance by increasing land-use diversity. In areas where a mix of land uses is most appropriate (downtown area, specific plan, corridor plans, etc.), cities are providing for a variety of development types and uses to enable shorter trips for shopping and entertainment.

Development can occur in many forms, ranging from single-family homes on large plots of land to multi-family housing with high vertical construction for residential areas, and single-use to multi-use zoning for commercial properties. While land development choices are typically made at the household or business level, recent studies show that individuals are more frequently demanding higher-density, multi-use regions that are more walkable. Most participating jurisdictions have identified portions of their communities where future higher-density development is desirable. Such development reduces both VMT and GHGs, as individuals can accomplish many tasks in a single mixed-use area. This also can improve community health by encouraging bicycling and walking, improve air quality by reducing tailpipe emissions, and increase the community's sense of place.

For the WRCOG subregion, mixed-use development is classified as having at least three of the following features either on-site or within 0.25 miles:

- Residential development
- Retail development

- Park
- Open space
- Office

With new multi-family residential and mixed-use developments, the need for external vehicle trips can be reduced by providing useful services/facilities on-site such as ATMs, vehicle fueling and recharging stations, electric vehicle infrastructure, and shopping venues.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley and Murrieta.

LT-9: Transit-Oriented Development

Place new developments in close proximity to transit services.

Place new residential or commercial developments in close proximity to high-quality transit services and provide design features that support active transportation and facilitate first-mile/last-mile solutions. High-quality transit would be defined as a Metrolink station or a fixed-route bus with headways of 15 minutes or less during peak commute hours.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Corona, Moreno Valley, Murrieta, and Riverside, and the County of Riverside.

LT-10: Local ZEV Programs: Infrastructure and Vehicle Purchases

Accelerate the transition to Zero Emission Vehicles (ZEVs)

This measure supports the regional uptake of zero emission vehicles (ZEVs) through local fleet vehicle transitions and expansion of supporting infrastructure, including EV charging and hydrogen refueling stations. Potential implementing actions include:

- Adopt an ordinance requiring EV charging stations for new development.
- Provide publicly accessible charging stations and other support for ZEVs.
- Streamline the permitting process for charging and fueling stations.
- Provide designated or preferential parking for ZEVs.
- Accelerate the purchase of ZEVs to replace fossil-fueled fleet vehicles
- Adopt a comprehensive neighborhood program to accommodate off-street paths and on-street facilities of designated space for Neighborhood Electric Vehicles (NEVs) and supporting infrastructure.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Moreno Valley, Murrieta, and Riverside.

LT-11: Subsidized Transit

Decrease the cost of transit by providing subsidies.

Increase access to transit by providing free or discounted passes to residents, employees, and/or students. Free or discounted transit passes could be provided by private institutions or companies as a service to its employees, residents, or students. Reducing the cost of transit promotes transit ridership as an alternative to single-occupancy vehicles, thereby reducing VMT and GHG emissions.

Within Western Riverside County, the typical approach has been to provide reduced cost transit passes such as those provided by UC Riverside and other universities. This approach is generally targeted at groups such as students or seniors who may lack access to vehicles.

The Inland Empire Commuter program, which consists of RCTC and SBCTA's Vanpool Programs provides services at no-cost to eligible Riverside County and San Bernardino County employers and commuters. IE Commuter helps employers set up customized rideshare programs for their employees and assists commuters by providing incentives for ridesharing.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the WRCOG 2022 Subregional CAP, and by the local CAPs developed for the cities of Murrieta and Riverside.

LT-12: Congestion Pricing/Express Lanes

Add express lanes along major freeways in Western Riverside County.

According to the City of Riverside CAP (2016), SCAG's analysis of critical corridors in the Inland Empire region found inter-county vehicle trips account for over 50 percent of all trips. Throughout the region, ongoing congestion issues—and therefore increased idle time and GHG emissions—have led to SCAG proposing increasing the network of express lanes that connect counties, including Riverside County. Extension of express lanes along State Route-91 (SR-91) and Interstate-15 (I-15) have recently become operational, reducing the travel time for those commuting into the City of Riverside from areas west of the City such as Corona and locations in Orange County. The City of Riverside CAP accounted for GHG reductions from these express lane expansions as well as a new I-15 Toll express lane from State Route-60 (SR-60) to Cajalco Road.

Congestion pricing has been examined by SCAG through its Express Travel Choices Study. Pricing mechanisms may include toll lanes/roads or mileage-based user fees, which discourage automobile traveling by increasing travel costs. Currently an expansion of the toll lanes on SR-91 is planned to continue these toll lanes through Corona and into Riverside.

The effectiveness of congestion pricing reflects the regional share of VMT reduction associated with this strategy, in addition to local actions. This approach accounts for the high degree of out-commuting that currently occurs in Western Riverside County as residents travel to jobs in Los Angeles, San Bernardino, and Orange Counties. Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the local CAP for the City of Riverside.

Local Measures – Solid Waste, Water, and Agriculture

LS-1: Zero Waste Initiatives

Exceed the state's mandates and strive for zero waste.

Potential actions for implementing this measure include:

- Expand or improve existing recycling and composting facilities.
- Enact local regulations and incentives to reduce total waste disposed of by residents, businesses, and institutions.
- Create a local food recovery program.
- Expand markets for material reuse.
- Expand community outreach and education on zero waste strategies.

Approximately 5 percent of the WRCOG subregion's 2017 emissions inventory is attributable to the landfilling of solid waste, where the organic fraction of the waste decomposes into methane, a powerful GHG. As noted in State Measure SW-1, it is important to divert organics from landfills to avoid the production of methane, but diverting other materials from landfills through recycling programs is also beneficial in that it reduces the life cycle emissions associated with the harvesting of virgin materials. And products that are repaired or reused, or designed to last longer, avoid the emissions associated with the manufacturing of new products.

Zero Waste is a set of principles focused on waste prevention that encourages the redesign of resource life cycles to maximize material recycling and product reuse. While recognizing that zero waste in a literal sense is not practically achievable, some cities across the country have demonstrated that the key zero waste principles of reduce, reuse, and recycle can be put to maximum effect to achieve diversion rates of 80 to 90 percent, which goes beyond the State of California's 75 percent diversion mandate for municipal solid waste. Many cities throughout California have in place ordinances to achieve diversion rates of 90 percent or more, and "zero waste" plans in place to achieve those targets. Such plans typically include strategies to expand or improve existing recycling and composting facilities; various regulations and incentives to reduce total waste disposed by residents, businesses, and institutions; programs to educate the public on zero waste strategies; and policies regarding manufacturer product stewardship and markets for material reuse.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the cities of Corona, Murrieta, and Riverside. None of the participating cities WRCOG's 2022 Subregional CAP committed to waste diversion beyond what is accounted for in Measure SR-1.

LW-1: Increase Recycled Water Use

Expand the available water supply through water recycling and reuse infrastructure.

This measure supports expanding the available water supply through water reclamation (recycling) and water reuse infrastructure. Water reclamation is reusing treated wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, toilet

flushing, and replenishing a ground water basin (referred to as ground water recharge). Gray water is reusable wastewater from residential, commercial and industrial bathroom sinks, bathtubs, showers, and clothes washing equipment drains that is treated onsite, and then reused, typically for landscape irrigation.

Cities can help improve water recycling and reuse infrastructure by expanding purple pipe networks, and they can help conserve the water supply by upgrading water infrastructure and conveyance systems to minimize leaks and prevent waste.

Cities can support the use of graywater and rainwater catchment systems by streamlining the permitting process, offering rebates and incentives for installation of these systems, and providing information at the permitting counter for developers, business owners, and homeowners. Rainwater catchment systems collect runoff from roofs or other non-permeable surfaces, which is then redirected to a cistern or containment mechanism. Rainwater gardens may also be constructed that direct rainwater into a deep pit or larger reservoir with percolation, or it can be collected from dew or fog with nets or other tools. Rainwater can then be used for gardens, livestock, irrigation, or domestic use with proper treatment, and indoor heating for houses.

Easter Municipal Water District (EMWD) offers rebates for rain barrels and cisterns, through its partnerships with Metropolitan Water District (MWD) and the SoCal Water$mart program.

Table 4-21 summarizes the 2030 GHG reductions from this measure as estimated by the cities of Corona and Murrieta. None of the participating cities WRCOG's 2022 Subregional CAP committed to water recycling or conservation beyond what is accounted for in Measure SW-1.

LA-1: Local Agriculture & Community Gardens

Support local farms, community gardens, and sustainable food production.

This measure supports local farms, community gardens, and sustainable food production. Our diets and the decisions we make as individual consumers about the food we purchase have a big impact on our "carbon footprint." Globally, approximately one third of GHG emissions result from the food system, when accounting for importation, refrigeration, deforestation, and other food system processes. Although a community GHG inventory does not directly account for emissions from agricultural activities occurring outside the City, choosing more sustainably produced food yields benefits for individuals and the community at large. Eating locally produced, fresh food, and choosing vegetarian options, has the dual benefit of lowering GHG emissions associated with food production while improving community health.

Growing food locally and distributing it through local channels like farmers' markets, rather than importing it from distant lands, can reduce emissions because less fuel is required for transporting food to the consumer. Local food production also has the co-benefits of creating local jobs and enhancing resilience, and can improve health if sustainable organic farming and production methods are used. But more influential to the carbon footprint of food is what we eat and when we eat it – for example, eating seasonal vegetables vs. meat. Certain foods require more energy and fossil fuel inputs than others, making it possible to reduce emissions by choosing foods that have a lower GHG intensity.

Recent studies indicate that transitioning toward more plant-based diets that are in line with standard dietary guidelines could reduce global GHG emissions by up to 70 percent by 2050. Also important is how food is farmed and produced. Factors related to meat and dairy production include the energy inputs involved in rearing farm animals and the methane output from those animals. Factors related to fruit, vegetable and grain farming include the use of nitrogen-based fertilizers, soil tilling techniques, and the energy used for water pumping and irrigation. Organic farming generally produces foods with a lower carbon footprint than conventional farming but also tends to use more land per kilogram of food produced. Due to all of these factors it is a complex endeavor to accurately estimate the GHG emissions associated with the foods we consume.

Although this measure is included in both the WRCOG's 2022 Subregional CAP and the City of Riverside CAP, it is presented as a supporting measure with no associated GHG emissions reductions.

SBCOG Measures

The GHG reduction measures for the SBCOG subregion are described below and summarized in **Table 4-22** Measures are described and labeled based on the organizing structure of the San Bernardino Regional GHG Reduction Plan (2021), which includes the sectors of Energy, Transportation, Solid Waste, Water & Wastewater, Agriculture, and Land Use and Urban Design, and organized measures under the state, regional, and local categories. As described in Chapter 3, the existing local CAPs were reviewed for consistency with the 2021 GHG Reduction Plan. The methods used to estimate GHG emission reductions from the measures listed in Table 4-22 are described in Appendix B of the San Bernardino Regional GHG Reduction Plan.

Table 4-22
PCAP Measures - SBCOG Subregion

ID	PCAP Measure	Sources (see key below)	Subregional GHG Reduction Potential by 2030
State Mandates			
State-1	Renewables Portfolio Standard (RPS)	1	1,741,332
State-2	Title 24 Building Energy Standards	1	812,849
State-3	SB 350	1	146,388
State-4	Solar Water Heating	1	1,427
State-5	Co-Generation Facilities	1	812,849
State-6	Pavley plus LCFS	1	2,791,668
State-7	AB 32 Methane Capture	1	602,052
Local Measures			
Building Energy			
Energy-1	Energy Efficiency for Existing Buildings	1,2,3,4,5,7,8,9	10,032
Energy-2	Outdoor Lighting	1,3,7,8,9	82,810
Energy-3	Building Electrification	1,2,7	20,876
Energy-4	Solar Installations for New Commercial/Industrial Development	1,2,4,7	342,851
Energy-5	On-site Solar Energy for New and Existing Warehouse Space	1,4,7	28,124
Energy-6	Solar Installations for Existing Housing	1,2,3,4,5,6,7,9	78,538
Energy-7	Solar Installations for Existing Commercial Buildings	1,2,3,4,6,7,8,9	102,296
On Road Transportation			
On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric	1,2	3,354
Transportation-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting	1,2,3,4,7	73,489
Transportation-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization	1,3,4,7	28,820
Transportation-4	Expand Bike Routes	1,2,3,4,7	37,397

Table 4-22
PCAP Measures - SBCOG Subregion

ID	PCAP Measure	Sources (see key below)	Subregional GHG Reduction Potential by 2030
Transportation-5	Community Fleet Electrification	1,4,5,7	49,586
Off Road Transportation and Equipment			
Off Road-1	Electric-Powered Construction Equipment	1,4,7,8	8512
Off Road-2	Idling Ordinance	1,4,8,9	4593
Off Road-3	Electric Landscaping Equipment	1,8	7,159
Solid Waste Management			
Waste-1	Waste Diversion	1,3,4,7,8,9	379,076
Water Conveyance			
Water-1	Require Adoption of the Voluntary CALGREEN water efficiency measures for New Construction	1,4,8	0
Water-2	Require Adoption of the Voluntary CALGREEN water efficiency measures for Existing Buildings	1,4,8	63,912
Water-3	Encourage Water-Efficient Landscaping Practices	1,3,4,6,7,8,9	9,101
Wastewater Treatment and Discharge			
Wastewater-1	Methane Recovery	1,8	1,194
Wastewater-2	Equipment Upgrades	1,4	3,149
Agriculture			
Agriculture-1	Methane Capture at Large Dairies	1,4	0
Land Use and Urban Design			
Land Use-1	Promote Rooftop Gardens	1,4	2
Land Use-2	Urban Tree Planting	1,2,4,7,8	323
GHG Performance Standard for New Development			
PS-1	GHG Performance Standard for New Development	1,3,6,7,8,9	169,203

KEY:

1 – San Bernardino Regional GHG Reduction Plan (2021)
2 – Apple Valley Climate Action Plan (2021)
3 – City of Chino Climate Action Plan Update (2020)
4 – City of Ontario Community Climate Action Plan (2023)
5 – City of Redlands Climate Action Plan (2017)
6 – City of Yucaipa Climate Action Plan (2015)
7 – City of Rancho Cucamonga Action Plan (2021)
8 – City of Colton Climate Action Plan (2015)
9 – Unincorporated San Bernardino GHG Reduction Plan Update (2021)

State Measures

Emissions reductions at the state level are primarily achieved through regulations, such as efficiency standards for passenger vehicles, reduction in carbon content of transportation fuels, and minimum renewable energy supply requirements for utilities. In addition, California's regulations mandate water conservation and waste diversion from landfills.

Measures regulated and implemented by the state and federal government achieve reductions without additional action by local communities. That is, even if VMT within the subregion remains constant over time, resulting GHG emissions would decrease because as new vehicles are purchased, they would in general be more GHG-efficient than those they replace.

State and federal programs typically require action at the local level in order to be successful. For example, the California Green Building Standards Code (CALGreen and the Title 24, Part 6 energy standards) requires, at a minimum, that new buildings and renovations in California meet certain design standards. New residential and commercial buildings must meet certain baseline efficiency and sustainability standards. These baselines are established through locally adopted building codes and will result in GHG reductions. Additional voluntary building code provisions, known as Tier 1 and Tier 2 requirements, can be adopted locally, providing even greater energy savings and emissions reductions.

State-1: Renewables Portfolio Standard

Mandates for utilities to source their power from renewable sources.

Through a series of increasingly stringent bills first enacted in 2002, California has placed requirements on electric utilities to procure a portion of their energy from renewable sources. The standard, known as the Renewables Portfolio Standard (RPS), applies to investor-owned utilities, publicly owned utilities, electricity service providers, and community choice aggregators. Therefore, all electricity-providing utilities servicing San Bernardino County (Southern California Edison, Bear Valley Electric Service, Colton Public Utilities, City of Needles, Victorville, and Rancho Cucamonga Municipal Utilities) must meet these targets:

1. 44 percent of retail sales from renewables by 2024
2. 52 percent of retail sales from renewables by 2027
3. 60 percent of retail sales from renewables by 2030
4. 100 percent of retail sales from renewables by 2045

Meeting these goals will lead to reduced GHG emissions associated with electricity, as more electricity will be generated by sources with zero or lower carbon intensity. Table 4-22 summarizes the 2030 GHG reductions from the RPS are presented in the 2021 San Bernardino Regional GHG Reduction Plan. Under Measure STATE-1, the 2021 San Bernardino GHG Reduction Plan accounted for a RPS of 60 percent renewables by 2030.

State-2: Title 24 Standards for Non-Residential and Residential Buildings

Mandates energy and water efficiency standards for buildings.

Building energy efficiency standards are designed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. California's building energy efficiency standards (Title 24, Part 6) are listed in the California Code of Regulations. These standards began in 1978 and are updated every 3 years, generally become more stringent

with respect to efficiency requirements. They are generally enforced through locally adopted building codes and inspection processes. Over the next decade the Title 24 standards are expected to implement the goals of the California Energy Efficiency Strategic Plan, to achieve zero net energy (ZNE) performance for all new low-rise homes constructed after 2020, and for all new commercial buildings constructed in or after 2030. The latest adopted standards (2022), which become effective January 1, 2023, reduce energy use in new single family, multifamily, and nonresidential buildings. They encourage installation of efficient electric heat pumps, establish electric-ready requirements for new homes, expand solar photovoltaic and battery storage standards, and update efficiency measures for lighting, building envelopes, and HVAC systems.

Under Measure State-2, the 2021 SBCOG Regional Greenhouse Gas Reduction Plan accounted for future updates to Title 24 by assuming stringency of the standards will be increased by 7 percent every three years starting in 2019. Regarding existing local CAPs in the SBCOG subregion, Yucaipa accounted for efficiencies associated with the 2008 version of Title 24.

State-3: SB 350 Clean Energy and Pollution Reduction Act

Requirements to double statewide energy efficiency savings by 2030.

In 2015, California adopted SB350, which requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. The quantification of Measure State-3 assumes that statewide electricity and natural gas savings targets, developed by the CEC, may be adjusted to local jurisdictions based on statewide and city populations. In addition, the quantification assumes that all reductions in energy consumption from Title 24 Standards and from solar water heater deployment overlap with SB 350 reductions.

State-4: AB 1470 (Huffman) Solar Water Heaters

Encourages the installation of solar water heaters.

Beginning in 2017, AB 1470 was a 10-year program encouraging the installation of 200,000 solar water heating systems by 2017. AB 797 revised the program to promote the installation of solar thermal systems throughout the state, reserve 50 percent of the total program budget for the installation of solar thermal systems in low-income residential housing or in buildings in disadvantaged communities, and extend the operation of the program through July 31, 2020.

The resulting program is the California Solar Initiative CSI-Thermal Program, which offers cash rebates of up to $4,366 on solar water heating systems for single-family residential customers. Multifamily and Commercial properties qualify for rebates of up to $800,000 on solar water heating systems and eligible solar pool heating systems qualify for rebates of up to $500,000.

Given that California relies heavily for natural gas water heating, AB 1470 seeks to provide incentives for installing rooftop solar water heating technologies, which will reduce fuel consumption, thereby lowering GHG emissions. CARB estimates that implementation of AB 1470 would result in the installation of 200,000 solar water heaters by 2020. Assuming that an average of 0.004 heaters per home would be replaced as a result of AB 1470, and that the participating cities would have 61,538 water heaters would be replaced with solar water heaters between 2016 and 2020. Each solar water heater will reduce natural gas use by 128 therms

(California Air Resources Board, 2019). Natural gas reductions were calculated by multiplying 128 therms by the number of water heaters installed. GHG emissions reductions were then quantified by multiplying the total energy reductions by the appropriate utility emission factors.

State-5: Co-Generation Facilities

Requirements for investor-owned utilities to procure energy from CHP facilities.

The California Public Utilities Commission (CPUC) administers a Qualifying Facilities and Combined Heat and Power (QF/CHP) Program. The QF/CHP Settlement is implemented through this program, and requires that California's three largest investor-owned utilities (IOUs) (PG&E, SDG&E, and SCE) collectively procure 3,000 MW of capacity from combined heat and power (CHP) facilities by 2018. Qualifying facilities can sell the energy they generate to IOUs at predetermined prices and conditions. The QF/CHP Settlement also requires that California's three largest IOUs reduce GHG emissions by 4.82 MMT by 2020, consistent with targets in the 2017 CARB scoping plan. This goal was modified later by CPUC in 2015's Decision 15-06-028 to 2.72 MMT.

For the same level of power output, CHP systems (or co-generation systems) utilize less input energy than traditional separate heat and power (SHP) generation, resulting in fewer CO_2 emissions. In traditional CHP systems, heat created as a by-product is wasted by being released into the environment. In contrast, CHP systems harvest the thermal energy and use it to heat onsite or nearby processes, thus reducing the amount of natural gas or other fuel that would otherwise need to be combusted to heat those processes. In addition, CHP systems lower the demand for grid electricity, thereby displacing the CO_2 emissions associated with the production of grid electricity.

Energy reductions associated with other state and local measures were subtracted from the energy used by all new nonresidential buildings built from 2016 to 2020. This was done in order to determine the energy used by new buildings after the implementation of preceding measures, before the installation of co-generation. Emission reductions were estimated by determining the amount of emissions that need to be reduced to reach the goal of 2.72 million metric tons by 2020 based on current progress reports for the CHP program. Then, it was assumed that the remaining amount of reductions would be reached by jurisdictions by assuming they reduce GHG emissions from the CHP program in proportion to the respective populations of each jurisdiction.

State-6: AB 1493 (Pavley I and II) Greenhouse Reductions from New Passenger Vehicles

Requirements for vehicles to reduce fuel consumption.

In 2002, California adopted AB 1493, referred to as "Pavley 1," which directed CARB to develop fuel-efficiency standards for passenger vehicles in California by 2005. Through a series of rulings, CARB and the federal government agreed on federal standards that began in 2009 and increased through 2016. In January 2012, CARB approved the Advanced Clean Cars Program, an emissions-control program for model year 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By

2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Building from Pavley 1, Executive Order S-1-07, known as the Low Carbon Fuel Standard (LCFS), requires the carbon-intensity of California's transportation fuel to be reduced by at least 10 percent by 2020. In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction target to 20 percent by 2030.

The Advanced Clean Cars program also requires car manufacturers to offer for sale an increasing number of zero-emission vehicles (ZEVs) each year, including battery electric, fuel cell, and plug-in hybrid electric vehicles. In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017–2025 through compliance with the US EPA's GHG requirements for those same model years.

State-7: SB 1383 Methane Capture

Mandatory requirements to reduce landfill methane emissions.

The Landfill Methane Rule requires gas collection and control systems for landfills with greater than 450,000 tons of waste-in-place. The rule requires a 40 percent reduction in landfill methane emissions by 2030 from a 2013 baseline. As appropriate, landfill owners and operators would install methane capture technology and associated monitoring systems on all landfills without methane capture with a goal of increasing the facility level methane capture rate to the highest extent feasible (i.e., approaching 100 percent) The measure also establishes statewide performance standards to maximize methane capture efficiencies. Implementation of the landfill methane rule would reduce GHG emissions attributable to landfills by 40 percent.

Local Measures – Energy

Energy-1: Energy Efficiency for Existing Buildings

Promote energy efficiency through programs and incentives for existing buildings.

Building energy from residential, commercial, and industrial buildings is a large component of the subregional GHG inventory, accounting for 26 percent of the total subregional emissions in 2016. Older developments are typically less energy efficient and therefore consume greater amounts of electricity and natural gas, relative to newly constructed facilities. To reduce emissions related to building energy, this measure promotes energy efficiency in existing residential and nonresidential buildings, and removes funding barriers to energy-efficiency improvements. The following implementation strategies can be used to help achieve these goals:

- Promote energy efficiency in residential buildings:
  - Implement a low-income weatherization program.
  - Partner with community services agencies, utilities, nonprofits, and other entities to incentivize energy-efficiency projects, including HVAC, lighting, water heating equipment, insulation, and weatherization for low-income residents. Residential energy-efficiency projects can be financed through programs such as PACE or California First,

which allow property owners to finance improvements that are repaid through an assessment on their property taxes for up to 20 years. Incentives, such as those available from California Energy Upgrade, can also assist. These and similar programs are often administered through the participating local government entity.

  - Launch energy-efficiency campaigns targeted at residents. Provide public education on the need for energy efficiency and emissions reduction programs and incentives.
  - Promote Smart Grid (an electrical grid that uses digital information and controls technology to improve reliability, security, and efficiency of the grid)

- Promote energy efficiency in nonresidential buildings:
  - Incentivize schedule energy-efficiency "tune-ups" of existing buildings. Energy audit and tune-up programs are typically run by the local utility. Jurisdictions would work with utilities to take advantage of energy audit programs for municipal buildings and promote awareness of these programs for private commercial buildings.
  - Promote individualized energy management services for large energy users. Jurisdictions would work with utilities to take advantage of energy audit programs for municipal buildings and promote awareness of these programs for private commercial buildings.
  - Partner with utilities to leverage the Savings by Design incentive program for commercial projects. The Savings by Design incentive requires efficiency standards to be 10 percent better than Title 24 energy in order to qualify; up to $200,000 in performance rebates per project are available.
- Remove funding barriers to energy-efficiency improvements. For example, leverage federal tax credits or local rebates, such as those offered by Southern California Edison. Participate in programs (national, state, or regional) that provide innovative, low-interest financing for energy-efficiency and alternative energy projects. Promote incentives to encourage the use of energy-efficient equipment and lighting. Provide financial incentives for adoption of identified efficiency measures.
  - Launch energy-efficiency campaigns targeted at business. Provide public education on the need for energy efficiency and emissions reduction programs and incentives. Outreach programs can be sponsored by individual jurisdictions or by a region-wide consortium.
  - Remove funding barriers to energy efficiency improvements. For example, leverage federal tax credits or local rebates, such as those offered by Southern California Edison. Identify funding sources to assist affordable housing managers in incorporating energy-efficient designs and features.
  - Participate in PACE programs such as California First or similar programs, as feasible. These programs allow property owners to finance improvements that are repaid through an assessment on their property taxes for up to 20 years. These and similar programs are often administered through the participating local government entity.

Energy savings for each sub-measure were generally calculated by multiplying BAU energy use by a penetration rate, and then by a percent reduction in energy use. Emission reductions were then calculated by multiplying the energy savings by the appropriate emission factors.

Primarily existing measures, plus any new ones. The expected GHG reductions for this measure are 10,032 $MTCO_2e$.

Energy-2: Outdoor Lighting

Adopt outdoor lighting standards to reduce electricity consumption.

By adopting outdoor lighting standards in the zoning ordinance, jurisdictions can reduce electricity consumption. Reducing electricity consumption of outdoor lighting through upgrades in existing developments can be achieved by requiring a percentage of outdoor lighting fixture to use LED bulbs by 2030. The lighting standards could also include the following provisions:

- Encourage lighting along the urban-rural edge, not to exceed one half the current maximum lighting standard.
- Prohibit continuous all-night outdoor lighting in parks, sport facilities, construction sites, and other relevant areas (unless it compromises safety).
- Implement or exceed CALGreen's nonresidential voluntary mandatory measures related to outdoor lighting controls and equipment (Section A5.209.3) and outdoor lighting (Section A5.209.4), (i.e., achieve CALGreen Tier 1 lighting standards or otherwise demonstrate that energy efficiency of lighting fixtures exceeds mandatory Title 24 by a minimum 15 percent).

To implement this measure, jurisdiction governments can adopt outdoor lighting standards in their zoning ordinances. Implementation would be gradual through 2030 as an increasing number of outdoor lighting fixtures and traffic lights are replaced with energy-efficient fixtures. The estimated GHG reduction potential for this measure is 82,810 $MTCO_2e$.

Energy-3: Building Electrification

Adopt building electrification targets and incentives for new commercial and residential buildings and retrofits.

The adoption of this measure would require jurisdictions to adopt building electrification targets and incentives, for both new commercial and residential buildings and retrofits. It is recommended that jurisdictions establish a goal that a percentage of new and existing buildings use HVAC and water heating systems. This goal could be supported through nonfinancial incentives or streamlined permitting. The estimated GHG reduction potential for this measure is 20,876 $MTCO_2e$.

Energy-4: Solar Installations for New Commercial and Industrial Development

Establish a goal for solar installations on new commercial and industrial development.

Solar installation on new commercial and industrial development increases the amount of renewable energy being produced, thereby lowering the use of more GHG intensive sources of energy and decreasing GHG emissions. This measure encourages new businesses to install rooftop solar using Power Purchase Agreements and other low or zero up-front cost options for installing solar photovoltaic systems. Jurisdictions adopting this measure could establish goals for

solar installations on new commercial and industrial development to be achieved before 2030. Potential goals include:

- Aggressive commitment —30 percent of energy requirements for new development supplied by onsite solar power.
- Medium commitment —15 percent of energy requirements for new development supplied by onsite solar power.
- Low commitment—5 percent of energy requirements for new development supplied by onsite solar power.

These goals could be supported through nonfinancial incentives or streamlined permitting through the jurisdictions. Primary funding would likely be through state- or utility-level programs or through private funding such as a PPA. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities. The estimated GHG reduction potential for this measure is 342,851 $MTCO_2e$.

Energy-5: On-site Solar Energy for New and Existing Warehouse Space

Promote and incentivize solar installations.

This measure would promote and incentivize solar installations on existing and new warehouse space through partnerships with Southern California Edison and other private sector funding sources including SunRun, Tesla, and other solar lease or PPA companies. To implement this measure, jurisdiction governments can work with private companies and utilities to provide funding for solar energy projects. Implementing this measure would be gradual through 2030 as new warehouse spaces are constructed and equipped with solar installations and existing warehouse spaces are retrofitted. This measure also encourages jurisdiction governments to establish goals such as:

- 15 percent of existing and new warehouse roof space install solar installations.
- 20 percent of existing and new warehouse roof space install solar installations.
- 30 percent of existing and new warehouse roof space install solar installations.

This goal could be supported through non-financial incentives or streamlined permitting. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities. The estimated GHG reduction potential for this measure is 28,124 $MTCO_2e$.

Energy-6: Solar Installations for Existing Homes

Increase solar installations on existing single-family homes.

This measure would establish a goal for solar installations on existing single-family homes to be achieved before 2030. Potential goals might be:

- Aggressive commitment—25 percent of existing single-family homes install solar.
- Medium commitment —20 percent of existing single-family homes install solar.

- Low commitment—15 percent of existing single-family homes install solar.

These goals could be supported through nonfinancial incentives or streamlined permitting through the jurisdictions. Primary funding would likely be through state- or utility-level programs or through private funding such as a PPA. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities. To implement this measure, the jurisdiction governments can work with private companies to provide funding for solar energy projects. Implementation of this measure would be gradual through 2030 as new single-family residential developments are constructed and equipped with solar installations. The estimated GHG reduction potential for this measure is 78,538 $MTCO_2e$.

Energy-7: Solar Installations for Existing Commercial and Industrial Buildings

Establish a goal for solar installations on existing commercial and industrial buildings.

Jurisdiction governments would establish a goal for solar installations on existing commercial and industrial building to be achieved before 2030. Potential goals include:

- Aggressive commitment —30 percent of existing buildings have solar installations.
- Medium commitment —20 percent of existing buildings have solar installations.
- Low commitment—10 percent of existing buildings have solar installations.

The selected goal could be achieved in part through private funding from SunRun, Tesla, or other solar lease PPAs. Additionally, nonfinancial incentives and streamlined permitting at the local level can support this goal. Jurisdictions may also act as resources for connecting property owners with funding opportunities. This measure could complement voluntary CALGreen measures related to solar photovoltaic systems. To implement this measure, the jurisdiction governments can work with building owners, state funding programs, and private companies to provide funding for solar energy projects. Implementation of this measure would be gradual through 2030 as solar is installed on existing buildings. The estimated GHG reduction potential for this measure is 102,296 $MTCO_2e$.

Local Measures – On Road Transportation

On-Road-1: Alternative Fueled Transit Fleets – CNG to Electric

Converting County transit fleet from compressed natural gas (CNG) to electric.

Emissions from the County's transit fleets originate from the combustion of fossil fuels, such as diesel, gasoline, and CNG, to power vehicles. The transportation sector represents the largest source of GHG emissions in the County's future community GHG inventory. Therefore, reduction measures in the on-road transportation sector have the highest GHG reduction potential relative to other sectors.

This measure suggests the conversion from a mostly CNG transit fleet to an all-electric transit fleet in the County. Converting transit fleets from CNG to electric will reduce GHG emissions from the combustion of CNG. On the other hand, the increased electricity consumption will

increase GHG emissions. However, the GHG emission reductions will be significant in the long term as electricity will be generated from more renewable sources and ultimately achieve zero emissions. To implement this measure, the jurisdictions would coordinate with transit authorities in the subregion to convert CNG transit buses to electric. Implementation of this measure would most likely be achieved in increments because the electric transit bus technology is evolving. The estimated GHG reduction potential for this measure is 3,354 $MTCO_2e$.

On Road-2: Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting

Encourage alternate modes of transportation.

Commute Trip Reduction programs aim to reduce commute trips and VMT through various strategies. The strategies include encouraging the use of mass transit (including electrification of passenger rail), carpooling, ridesharing, and telecommuting. The level of VMT reductions that this measure could achieve depends on the level of commitment, from completely voluntary to required implementation with monitoring and performance standards. Jurisdictions could start implementing this measure for government employees, and then expand to adopting an ordinance to require businesses to implement Commute Trip Reduction programs. This measure only reduces commute trip VMT; it is assumed that commute trip VMT makes up 30 percent of total VMT.

The COVID-19 pandemic caused an unexpected increase in telecommuting in 2020. According to Gallup[45] at the height of the pandemic in April, 51 percent of the U.S. workforce worked remotely full time, and 18 percent of the workforce was able to work remotely part time. By September, the percentage of full-time telecommuters dropped to 33 percent and part-time telecommuters increased to 25 percent. Although this high level of telecommuting is anticipated to significantly reduce VMT in 2020 (and possibly in future years now that it has been demonstrated to be feasible for many), it is not reflected in the current modeling scenarios used for this plan. Jurisdictions could adopt a Commute Trip Reduction Ordinance and require businesses to implement Commute Trip Reduction programs to achieve the highest level of VMT reductions. Alternatively, jurisdictions could implement this measure on government employees and encourage businesses to provide employer support on commute trip reductions. The estimated GHG reduction potential for this measure is 73,489 $MTCO_2e$.

Current initiatives to encourage ridesharing include the Inland Empire Commuter program, which consists of RCTC and SBCTA's Vanpool Programs provides services at no-cost to eligible Riverside County and San Bernardino County employers and commuters. IE Commuter helps employers set up customized rideshare programs for their employees and assists commuters by providing incentives for ridesharing.

Another initiative to help reduce VMT in the region could be a VMT Mitigation Bank which SBCTA is attempting to initiate. This bank could pool fees from development projects across multiple jurisdictions to spend on larger scale mitigation projects or transportation demand

45 Gallup. 2020. "COVID-19 and Remote Work: An Update." October 13, 2020. Available online at: https://news.gallup.com/poll/321800/covid-remote-work-update.aspx.

management measures (like an expanded telework commute trip reduction program) that could have the potential for a more significant reduction in VMT and on regional scale.

On Road-3: Signal Synchronization

Improve efficiency through signal synchronization.

This measure implements signal synchronization to improve traffic flow and reduce GHG emissions from less idling time and less stop-and-go driving. Signal timing optimization could be done with or without real-time traffic data. The jurisdiction's traffic engineers would study all signaled intersections in the jurisdiction and develop a signal timing optimization plan, and then adjust the signal timing. New signals need to be designed consistent with the signal timing optimization plan before approval for installation. Jurisdictions choosing this measure and implementing signal synchronization would reduce 1 percent of on-road transportation GHG emissions from reduced idling time and reduced stop-and-go traffic. The estimated GHG reduction potential for this measure is 28,820 $MTCO_2e$.

On Road-4: Expand Bike Routes

Expand bike routes including pedestrian and bicycle friendly streets.

Pedestrian- and bicycle-friendly roads are crucial to promoting walking and bicycle use as a transportation method. People tend to walk or bicycle if sidewalks and bicycle routes are available and separate from motor vehicles so that pedestrians' and bicyclists' safety can be ensured. Adopting and implementing a bicycle master plan and constructing more bicycle routes would encourage more bicycle rides and would help to reduce VMT and associated GHG emissions. The jurisdiction governments are encouraged to develop and adopt a bicycle master plan that sets a goal for miles of bicycle lanes to be constructed within the jurisdiction. Potential commitment levels could be 2 miles of bicycle lanes per square mile, 4 miles of bicycle lanes per square mile, or 8 miles of bicycle lanes per square mile. The estimated GHG reduction potential for this measure is 37,397 $MTCO_2e$.

On Road-5: Community Fleet Electrification

Encourage the adoption of electric vehicles and ensure access to EV infrastructure.

Hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric vehicles (EVs) produce lower emissions than conventional vehicles. All EV types emit at least 40 percent less GHG emissions than conventional vehicles. However, more than 95 percent of people still drive conventional gasoline or diesel vehicles, so programs to encourage the use of EV or hybrid vehicle ownership are greatly needed.

Executive Order (EO) B-16-2012 tasked the California Energy Commission (CEC) and other state agencies to support benchmarks to bring 1.5 million zero emission vehicles (ZEVs) to California's roads, and in conjunction to make sure that Californians have easy access to ZEV infrastructure to charge those vehicles by 2025. SBCOG projected that to comply with EO B-16-2012, there would be 44,846 ZEVs in San Bernardino County by 2025, and a total of 4,761 Level

2 and Level 3 charging stations would be needed to support the ZEVs.[46] Each jurisdiction would be responsible for a portion of the charging station needs to support increased number of ZEVs. Jurisdictions choosing this measure would need to require new residential and commercial development to install charging stations on site. In addition, jurisdictions could work with businesses to install charging stations in office parking lots and provide incentives to encourage residents to install charging stations at home. The estimated GHG reduction potential for this measure is 49,586 $MTCO_2e$.

Local Measures – Off Road Transportation and Equipment

Off Road-1 Electric-Powered Construction Equipment

Establish a goal for construction equipment to utilize electricity as power.

This measure reduces diesel-powered construction equipment use and encourages electric-powered construction equipment by establishing a goal such that a portion of construction equipment is electric-powered. With current technology, equipment with relatively low horsepower could be converted to electric. Potential goals might be to require 80−100 percent of equipment that is less than 120 horsepower to be electric powered.

Under this measure, incentives would be offered (e.g., reduced procedural requirements; preference points when bidding on jurisdiction contracts, partner with CARB or SCAQMD to leverage funding) to construction contractors that utilize electric equipment in a certain percentage of their fleet.

Achieving the goal would require close coordination with the SCAQMD, which sets air quality related requirements on construction vehicles and also provides mitigation options related to construction vehicles through Voluntary Emission Reduction Agreement (VERA) programs, which may overlap with this measure. The estimated GHG reduction potential for this measure is 8,512 $MTCO_2e$.

Off Road-2 Idling Ordinance

Adopt an ordinance that limits idling for heavy-duty construction equipment.

This measure would have jurisdictions adopt an ordinance that limits idling time for heavy-duty construction equipment beyond CARB or local air district regulations and if not already required as part of CEQA mitigation. Recommended idling limit is three minutes. As part of permitting requirements or City contracts, encourage contractors a to submit a construction vehicle management plan that includes such things as idling time requirements; requiring hour meters on equipment; and documenting the serial number, horsepower, age, and fuel of all on-site equipment. State law currently requires all off-road equipment fleets to limit idling to no more than five minutes. The jurisdiction governments can adopt ordinances restricting idling time. Implementation of this measure would be a one-time action. Once the ordinance is adopted, the

46 San Bernardino Council of Governments. (2019). Zero-Emission Vehicle Readiness and Implementation Plan. August.

measure would begin to yield benefits. The estimated GHG reduction potential for this measure is 4,593 $MTCO_2e$.

Off Road-3 Electric Landscaping Equipment

Adopt an ordinance that reduces gasoline or diesel-powered landscaping equipment use.

Under this measure the participating jurisdiction will adopt an ordinance that reduces gasoline or diesel-powered landscaping equipment use and/or reduces the amount and operating time of such equipment. With current technology, equipment with relatively low horsepower could be converted to electric. Potential goals might be to require 80 to 100 percent of equipment that is less than 120 horsepower to be electric powered. Jurisdictions would work in close cooperation with the air district in drafting an ordinance or developing outreach programs to be consistent with current air district rules and CEQA guidelines. The ordinance could also include the following provisions for community landscaping equipment:

- Sponsor a lawnmower exchange program that allows residents to trade in their gasoline or diesel-powered mower for an electric mower at a low or discounted price.
- Require exterior electrical outlets on all new building developments.

The estimated GHG reduction potential for this measure is 7,159 $MTCO_2e$.

Local Measures – Waste Diversion

Waste-1 Waste Diversion

Adopt citywide waste goals to divert waste.

Total emissions from solid waste generated by the cities account for approximately 5 percent of total subregional emissions for 2016. These emissions are fugitive emissions of methane that occur at numerous landfills spread throughout the state, and are considered an indirect emissions source. The materials disposed of by each Partnership city are recycled, composted, or placed in a landfill. Organic waste that is buried in landfills decomposes under anaerobic conditions to produce methane. Landfill-related emissions from waste are primarily methane, which is released over time when waste decomposes. Waste diversion programs are designed to reduce the amount of waste sent to landfills. In addition to GHG emissions and cost savings, diversion programs may reduce waste-hauling fees, as well as fuel combustion emissions for transporting waste to landfills. Likewise, reductions in landfilled waste would reduce the need for landfill space, which may contribute to future land conservation.

This measure would exceed the waste diversion goal (75 percent) required by AB 341 by adopting citywide waste goals to divert more than 75 percent of waste. In instances where cities operate their own waste services programs, they will have responsibility to expand or establish composting, recycling, and yard waste programs to residences and businesses. Cities would work with waste providers to identify a baseline, opportunities, and achievable diversion goals before a

certain time period, all of which can be incorporated into the waste provider's contract with a jurisdiction. This measure could include:

- Expand educational programs to inform residents about reuse, recycling, composting, waste to energy, and zero waste programs. Encourage local recycling and composting initiatives at the neighborhood level.
- Adopt a construction and demolition waste recovery ordinance that meets or exceeds the CALGreen voluntary guidance of a 65−75 percent reduction in nonhazardous construction and demolition waste.
- Encourage local businesses to expand their recycling and composting efforts and to reduce packaging of products manufactured in the cities.
- Establish a reuse/recycling center where furniture, appliances, building materials, and other useful, nonhazardous items may be dropped off or purchased for a nominal fee.
- Enhance regional coordination on waste management, to take advantage of economies of scale of recycling, composting, and other diversion programs.

The estimated GHG reduction potential for this measure is 379,076 $MTCO_2e$.

Local Measures – Water Conveyance

Water-1 CALGREEN Water Efficiency Measures for New Construction

Adopt voluntary CALGREEN water efficiency measures for new construction.

Water is not only an important resource with limited supplies, but the treatment, distribution, and conveyance of water requires considerable amounts of electricity. The generation of this electricity consumes fossil fuels and releases GHGs. Reducing water demand and conserving water can therefore save energy and avoid future emissions. Reduction measures in the water conveyance sector typically contribute small GHG reductions relative to other sectors. In 2010, the California Building Standards Commission unanimously adopted Title 24 Part 11 (also known as CALGreen), the mandatory green building standards code and the first such code in the nation. CALGreen requires all new buildings in the state to be more energy efficient and environmentally responsible. Effective January 1, 2011, CALGreen requires that every new building constructed in California reduce water consumption by 20 percent. CALGreen voluntary measures recommend a 30–40 percent reduction over BAU conditions in indoor water use and 55–60 percent reduction over BAU outdoor potable water use. This measure would require the adoption of the voluntary CALGreen water efficiency measures (at least Tier 1) for new construction. CALGreen voluntary measures recommend use of certain water-efficient appliances, plumbing and irrigation systems, as well as more aggressive water-savings targets. It would also update building standards and codes for new residential and nonresidential buildings to require adoption of these voluntary measures, including:

- Use of low-water irrigation systems.
- Installation of rainwater and gray water systems.
- Installation of water-efficient appliances and plumbing fixtures, as well as composting toilets.

The estimated GHG reduction potential for this measure is 0 $MTCO_2e$.

Water-2 CALGREEN Water Efficiency Measures for Existing Buildings

Adopt voluntary CALGREEN water efficiency measures for existing buildings.

This measure suggests the implementation of a program to renovate existing buildings to achieve higher levels of water efficiency. In addition, this measure would establish education and outreach programs to educate individuals on the importance of water efficiency and how to reduce water use. Rebate programs can help promote installation of water-efficient plumbing fixtures. The program could address:

- Development plans to ensure water conservation techniques are used (e.g., rain barrels, drought tolerant landscape).
- Water efficiency upgrades as a condition of issuing permits for renovations or additions of existing buildings.
- Adopt water conservation pricing, such as tiered rate structures, to encourage efficient water use.
- Incentives for projects that demonstrate significant water conservation through use of innovative water consumption technologies.

The estimated GHG reduction potential for this measure is 63,912 $MTCO_2e$.

Water-3 Water Efficient Landscaping Practices

Encouraging water efficient landscaping practices.

Water use contributes to GHG emissions indirectly, via the production of the electricity that is used to pump, treat, and distribute the water. California homes and businesses consume a significant amount of water through outdoor water use, which includes landscape irrigation. Designing water-efficient landscapes for a project site reduces water consumption and the associated indirect GHG emissions.

Examples of measures to consider when designing landscapes are reducing lawn sizes, planting vegetation with minimal water needs such as California native species, choosing vegetation appropriate for the climate of the project site, and choosing complimentary plants with similar water needs or which can provide each other with shade and/or water. Achieving this goal would not only reduce electricity consumption, but avoid GHG emissions and conserve water. This measure also suggests adopting a landscaping water plan that exceeds the requirements in the Model Landscape Ordinance (AB 1881). The estimated GHG reduction potential for this measure is 9,101 $MTCO_2e$.

Local Measures – Water Treatment and Discharge

Wastewater-1 Methane Recovery

Capture fugitive emissions that are emitted during the wastewater treatment process.

Methane capture reduces fugitive methane emissions that are emitted during the wastewater treatment process. Capturing the fugitive methane prevents it from reaching the atmosphere. Captured methane can also be utilized as an energy source to generate electricity or produce vehicle fuel, which reduces the need for external energy or fuel from a utility. Equipment upgrades can reduce the amount of electricity and natural gas used to power the equipment, which in turn reduces emissions associated with fuel combustion.

Under this measure, the participating jurisdiction will coordinate with the Inland Empire Utilities Agency (IEUA) or other local wastewater treatment providers to identify funding and cooperating agencies for establishing methane recovery systems at all wastewater treatment plants (WWTPs) that service the County residents. WWTPs in the subregion operated by IEUA, the City of San Bernardino, and Victor Valley Wastewater Reclamation Authority (VVWA) already have an approximately 62 percent methane capture rate. Jurisdictions serviced by these providers would only benefit from this measure if the methane capture rate could be increased. For WWTPs that currently do not have methane capture systems, plants operators would work with regional power providers, local jurisdictions, or other entities to identify funding for methane capture system installation. The estimated GHG reduction potential for this measure is 1,194 $MTCO_2e$.

Wastewater-2 Equipment Upgrades (Regional)

Upgrade and replace wastewater treatment and pumping equipment to be more energy efficient.

This measure encourages the jurisdictions to work with their local wastewater treatment provider to upgrade and replace wastewater treatment and pumping equipment with more energy-efficient equipment, as financially feasible, at the existing facilities. The measure would require all pumping and treatment equipment to be 25 percent more energy efficient at the time of replacement and utilize best management practices for the treatment of waste. This measure could also include the following:

- Assess the feasibility of using advanced treatment of recycled water with microfiltration or reverse osmosis for future potable water use. Assess associated energy/GHG tradeoffs and out of basin water supply.

This measure would require the individual wastewater treatment plants to upgrade pumping and treatment equipment. The upgrade of equipment is a one-time event, and implementation would be complete once the upgraded equipment begins operating. The estimated GHG reduction potential for this measure is 3,149 $MTCO_2e$.

Local Measures – Agriculture

Agriculture-1 Methane Capture at Large Dairies

Install methane digesters to capture methane emissions from decomposing manure.

Agriculture emissions accounted for approximately 3 percent of the total subregional emissions in 2016. These emissions are direct emissions resulting from livestock activity and the application of fertilizer. The three general sources of agricultural emissions evaluated in this inventory include livestock enteric fermentation, livestock manure management, and N_2O emissions from the application of fertilizer. Reduction measures in the agriculture sector typically provide modest GHG reductions relative to other sectors.

Reducing the jurisdictions' GHG emissions from the agriculture sector includes methane capture and combustion at large dairies and animal operations facilities. The large dairies with more than 1,000 cattle are located in Chino, Ontario, and Unincorporated County. Methane capture reduces fugitive methane emissions that are emitted from livestock as a result of decomposing manure. Capturing the fugitive methane prevents it from reaching the atmosphere. Captured methane can also be utilized as an energy source to generate electricity or produce vehicle fuel, which reduces the need for external energy or fuel from a utility.

This is a voluntary measure to be undertaken by large dairies and encourages the installation of methane digesters to capture methane emissions from the decomposing manure. The methane could be used on site as an alternative to natural gas in combustion, power production, or as a transportation fuel. Further, individual project proponents may be able to sell GHG credits associated with these installations on the voluntary carbon market. Dairies would need to install methane capture and control equipment at their facilities and employ other best management practices for reducing fugitive methane emissions. The City of Chino, City of Ontario, Unincorporated San Bernardino County, along with the air districts, can collaborate with the dairies to achieve this. The installation of equipment is a one-time event, and implementation would be complete once the equipment begins operating. The estimated GHG reduction potential for this measure is 0 $MTCO_2e$.

Local Measures – Land Use and Urban Design

Land Use-1 Promote Rooftop Gardens

Establish a goal for residences and commercial facilities to construct rooftop gardens.

A green roof or rooftop garden is a roof of a building that is partially or completely covered with vegetation and a growing medium, planted over a waterproofing membrane. It may also include additional layers such as a root barrier and drainage and irrigation systems. Green roofs serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and mitigate the heat island effect. This measure promotes the construction of rooftop gardens, which insulate the building underneath and increase energy efficiency. Rooftop gardens also cool the surrounding area through moisture retention and surface reflectively. The construction of the rooftop gardens would reduce energy consumption and associated GHG emissions in the building energy sector.

This measure would establish a goal for 5 percent of new multifamily residences and 15 percent of new commercial facilities over 100,000 square feet to construct rooftop gardens. Rooftop green space insulates the building underneath and increases energy efficiency. Rooftop gardens also cool the surrounding area through moisture retention and surface reflectivity. This measure could also reduce energy consumption and associated GHG emissions in the building energy sector. This measure could be implemented through the following incentives:

- Consider offering nonfinancial incentives, as feasible, to encourage rooftop gardens.
- Consider providing informational materials to contractors, homeowners, and businesses about the benefits of and incentives for rooftop gardens.

The estimated GHG reduction potential for this measure is 2 $MTCO_2e$.

Land Use-2 Urban Tree Planting

Establish a tree planting or tree preservation goal.

Trees can reduce the urban heat island effect through shading and evapotranspiration. In addition, if trees are located next to buildings, it can provide shade which reduces summer cooling energy consumption. This measure would establish a jurisdiction-wide tree planting goal or tree preservation goal. Possible implementation mechanisms might include a requirement to account for trees removed and planted as part of new construction and/or establishing a goal and funding source for new trees planted on jurisdiction property. This measure will reduce energy consumption and associated GHG emissions in the building energy sector by reducing the heat island effect. The jurisdiction governments can require trees to be planted as part of new construction, possibly as part of CEQA review and approval of new projects. Implementation of this measure would be gradual as new developments are constructed with accompanying trees. The estimated GHG reduction potential for this measure is 323 $MTCO_2e$.

Local Measures – GHG Performance

PS-1 GHG Performance Standard for New Development

Adopt a GHG performance standard for new development.

Individual jurisdictions may adopt a GHG Performance Standard for New Development (PS-1) that would provide a streamlined and flexible program for new residential and nonresidential projects to reduce their emissions. The PS would be a reduction standard for new private developments as part of the discretionary approval process under CEQA. Under PS-1, new projects would be required to quantify project-generated GHG emissions and adopt feasible reduction measures to reduce project emissions to a level that is a certain percent below BAU project emissions. PS-1 does not require project applicants to implement a pre-determined set of measures. Rather, project applicants are allowed to choose the most appropriate measures for achieving the percent reduction goal, while taking into consideration cost, environmental or economic benefits, schedule, and other project requirements.

A jurisdiction may select a suite of other local measures that may already meet the PS-1percent reduction goal specified by that jurisdiction. In these cases, a jurisdiction can still select PS-1 and

use it to support those local measures, even though direct reductions from PS-1 for those jurisdictions may be zero. An effort was made to not to double-count emissions reductions from PS-1 and overlapping local measures.

One means of implementing the Performance Standard would be through development of a point-based "screening table" that identifies a wide range of project-level measures that could be used to provide GHG reductions. The screening table provides the points for different types of measures and level of commitment and allows an easy way for project applicants to tally up their different proposed measures and see whether they meet the jurisdiction's specific PS. San Bernardino County has developed screening tables and guidance of how to apply them that are presently being used by new project applicants in the County as a means to help streamline project review. Each jurisdiction that ultimately chooses a PS approach as part of their local plan could develop its own screening tables. In addition, the jurisdictions participating in the subregional reduction plan have discussed a potential to develop regional screening tables that could apply to multiple cities which may further streamline reviews for cities that choose this approach. The estimated GHG reduction potential for this measure is 169,203 $MTCO_2e$.

CVAG Measures

The Coachella Valley Association of Governments has not created a comprehensive subregional climate action plan for its members, which consists of 10 cities, Riverside County, the Agua Caliente Band of Cahuilla Indians, and the Cabazon Band of Mission Indians. As a part of the PCAP process, CVAG has created a set of climate pollution reduction mitigation strategies for the subregion. This is a list of seven high-level strategies with sub-actions that reduce GHG emissions in the cities that are members of the CVAG. **Table 4-23** highlights these seven strategies in the Regional Measures section, while also summarizing the measures identified in each jurisdictional CAP that was published after 2013. This includes the Cities of Coachella, Indio, and Palm Springs. It should be noted that The City of Palm Springs Climate Action Roadmap (2021) serves as an initial step in developing more detailed climate goals and strategies to include in a future iteration of the City's Sustainability Plan.

Table 4-23
PCAP Measures - CVAG Subregion

ID	PCAP Measure	Sources (see key below)
State Mandates		
Energy		
State-1	Renewables Portfolio Standard (RPS)	1
State-2	Title 24 Building Energy Standards	1
State-3	SB 350	1
State-4	Solar Water Heating	1
State-5	Co-Generation Facilities	1
State-6	Pavley plus LCFS	1
State-7	AB 32 Methane Capture	1
Regional Measures		
Energy		
RE-1	Energy Conservation and Efficiency	2,3,4,5
RE-2	Government and School Facilities Building Decarbonization	2,3,4
Transportation		
RT-1	Ridesharing and Mass Transit	2,3,4,5
RT-2	Micromobility	2,3,4,5
RT-3	Traffic Signal Coordination	2,3
Water		
RW-1	Water Efficient Landscapes	2,3,4
Agriculture		
RA-1	Agriculture Efficiency Strategies	2,5

Table 4-23 PCAP Measures - CVAG Subregion		
ID	**PCAP Measure**	**Sources (see key below)**
Local Measures		
Energy		
LE-1	Alternative Energy Development	3,4,5
Transportation		
LT-1	EV Charging Infrastructure	4,5
Waste		
LW-1	Solid Waste Diversion and Recycling	3,5

KEY:
1 – San Bernardino Regional GHG Reduction Plan (2021)
2 – CVAG's Climate Pollution Reduction Regional Mitigation Strategies
3 – City of Coachella Climate Action Plan (2015)
4 – City of Indio Climate Action Plan (2019)
5 – City of Palm Springs Climate Action Roadmap (2021)

State Measures

The Coachella Valley Association of Governments has not established state GHG reduction measures, so it will utilize the state measures identified in the San Bernardino GHG Reduction Plan (2021).

Subregional Measures – Energy

RE-1 Energy Conservation and Efficiency

Build upon the California Energy Commission's Equitable Building Decarbonization Direct Install Program.

Energy efficiency and conservation are vital to lowering greenhouse gas emissions, especially as population sizes are expected to grow rapidly over the next several decades. This measure requires a concerted effort by government, utility companies, businesses, and individual homeowners to increase the energy efficiency of their homes and businesses beyond Title 24.

The measure highlights key actions including the implementation of a low-income weatherization program and launching an energy efficiency campaign targeted at residents. These campaigns would provide public education on the need for energy efficiency and emissions reduction programs and incentives.

In addition, the City of Coachella currently has energy efficiency measures including establishing performance targets in new construction and existing buildings, energy efficiency workshops, passive solar design, and energy efficient street lighting. The City of Indio also identified commercial and residential energy efficiency measures including low-income weatherization assistance, energy efficiency education, commercial benchmarking, residential transfer of energy disclosure. The City of Palm Springs Climate Action Roadmap identifies actions such as

developing ordinances to require homes to make certain targeted energy efficiency upgrades, provide incentives for home energy assessments, and building electrification ordinances.

RE-2 Government and School Facilities Building Decarbonization

Build on I-REN's Public Sector Program.

Reducing greenhouse gas emissions will take a society-wide shift to carbon neutral practices. The government can set the example for the private sector and its citizens by decarbonizing its own operations, whether through energy efficiency upgrade in buildings or creating energy plans. CVAG hopes to build on the I-REN Public Sector Program and offer funding for Imperial Irrigation District cities and school districts.

The City of Coachella has identified municipal operations as a key local action, which would help the city adopt and institutionalize practices that reduce municipal GHG emissions. In addition, the Coachella will improve building and facility efficiency by monitoring building performance and identifying cost-effective actions to reduce energy use. The City of Indio also adopted measures to improve the efficiency of municipal operations and public infrastructure including municipal benchmarking, facility upgrades, and traffic signal LED fixture upgrades.

Subregional Measures – Transportation

RT-1 Ridesharing and Mass Transit

Promote alternative forms of commuting to work and school.

The aim of this measure is to reduce commute trips and vehicle miles travelled (VMT) through various strategies. CVAG has proposed to accomplish this through strategies such as: CalVans, a Tesla Car Sharing Program, and Sunline's enhanced ride share (SunRide). CalVans supplies qualified drivers with late model vans to drive themselves and others to work or school. By promoting CalVans, the subregion can help reduce single-rider trips and the overall VMT of its citizens. The City of Coachella is implementing a Coachella Tesla Rideshare Program, which will be available via a mobile app that residents can request. Indio's CAP has a city employee carpooling program measure. The Coachella Valley's Sunline Transit Agency has an enhanced rideshare program (SunRide), which is a microtransit service, connecting riders to the fixed route network or to a single point of interest along a fixed route network in designated Coachella Valley zones.

A key aspect of a well-rounded transportation system is transit, and Coachella, Indio, and Palm Springs have created measures to improve mass transit and service coverage. Indio's CAP identifies supporting the expansion of the MetroLink commuter rail from Riverside as a measure. In addition, Palm Springs has two measures related to mass transit: promoting mass transit to and from Palm Springs and implementing an airport shuttle program and encouraging or requiring low-emitting mass transit options for events.

RT-2 Micromobility

Increase access to multimodal forms of transportation.

The aim of this measure is to reduce vehicle miles travelled by providing more bike lanes and sidewalks. By increasing walkability and creating safe bike lanes, citizens will be encouraged to adopt cleaner forms of transportation, thereby lowering the GHG emissions associated with transportation. The primary way that CVAG plans to do this is to construct a 40-mile paved multimodal trail, known as CV Link, to provide access for pedestrians, bicyclists, and low-speed electric vehicles (including golf carts) on a dual pathway that parallels Highway 111. CV Link will enable healthier lifestyles, spur economic innovation, and make the Coachella Valley a more sustainable and appealing place to live, work and play for many generations of residents and visitors. As bicycling and walking become more popular modes of transportation and recreation, CV Link will help to reduce deadly conflicts with motorists as well as provide a safer connection to schools, employment centers, public spaces and many valley attractions.

The City of Coachella has a measure to create neighborhood and site enhancements such as complete streets. The City of Indio has measures to improve pedestrian and bicycle infrastructure through implementing Complete Street and bicycle networks, expanding Safe Routes to School program to reach more schools, and develop and provide safe and secure parking for bicycles. Finally, the City of Palm Springs has established improving walkability as a transportation measure.

RT-3 Traffic Signal Coordination

Upgrades and Expansion to CVSync.

Coordinating traffic signals along an arterial provides smooth movement of traffic with minimal stops. This technique lowers the amount of fuel needed to move a certain distance and reduces GHG emissions because it reduces motorist stops and delays. Signal coordination also lessens congestion and resulting tail pipe emissions, which reduces GHG emissions and improves air quality. The City of Coachella also identified deploying Intelligent Transportation Systems as a measure to improve traffic flow and lower transportation emissions.

Subregional Measures – Water

RW-1 Water Efficient Landscapes

Reduce water usage through landscape design.

Water emits greenhouse gas emissions through the energy use for water processes. By decreasing water use, the GHG emissions associated with it will decrease as well. CVAG is addressing this through landscape design, specifically the removal of turf. Coachella calls for expanding programs that education and incentivize water conservation landscaping to support the reduction of water use. Indio also provides residents and businesses with incentives to replace grass with desert friendly landscaping.

RA-1 Agriculture Efficiency Strategies

Support the decarbonization of the agricultural industry.

The Coachella Valley Agriculture sector is valued at an estimated $600 million, according to the 2019 Coachella Valley Water District's (CVWD) 2019 Crop Report. It accounts for half the estimated $1.3 billion agriculture industry in Riverside County. According to the Coachella Valley Water District's estimations, agriculture is the "second largest contributor to the local economy," They estimate it contributes nearly $1 billion to the local economy and creates approximately 12,000 jobs. Given that the agricultural sector is so large in Coachella Valley, there are also associated GHG emissions. The CVAG has identified a few programs to help the industry decarbonize including:

- Identifying and replacing diesel water pump generators with new technologies that use renewable energy such as solar;
- Converting diesel engines for tractors and other machinery to natural gas or battery;
- And increasing renewable energy generation at agriculture sites to reduce reliance on fossil fuels for electricity and machinery.

Measures from the Palm Springs Climate Action Roadmap related to the agricultural sector include an electric lawn equipment ordinance and promoting more sustainable cannabis grow facilities.

Local Measures – Energy

LE-1 Alternative Energy Development

Advance and promote the incorporation of alternative energy generation.

The Cities of Coachella, Indio, and Palm Springs have all identified supporting non-fossil carbon-based energy generation, such as solar, wind and biomass, in public and private developments. California adopted a Renewables Portfolio Standard that requires utilities, such as the Imperial Irrigation District, to increase procurement from renewable energy sources. These cities intend to go beyond that goal by facilitating low- or zero-carbon electricity generation, which will lower the GHG emissions associated with energy. The City of Indio has two measures to increase solar generation including an annual goal to increase solar capacity on existing residential rooftops through financing and an annual goal for installing 2,500 kW of solar capacity on existing non-residential properties. In addition, the City of Palm Desert is supportive of microgrid construction and strives to pilot microgrid projects. Palm Desert participates in Coachella Valley's Sunline Transit Agency's rideshare program, SunRide. SunRide is exploring pilot microgrid projects projects using solar and hydrogen. For the solar option, SunRide is exploring installing solar panels to supply energy for EV charging stations at rideshare locations along the fixed network route. This microgrid EV charging initiative would help to meet the growing demand for electric vehicle charging stations and power other electric transit vehicles belonging to the Sunline Transit Agency. For hydrogen, SunRide is exploring microgrid construction to support hydrogen fueling for transit, commercial and private use.

The City of Palm Springs has set a goal to move to the 100 percent carbon-free option for Palm Springs residents under Desert Community Energy (DCE). The launch of DCE occurred in April 2020 and continues to be a focus of DCE, City staff, and a dedicated Palm Springs Working Group of DCE's Community Advisory Committee. The City's decision to shift to carbon-free energy as the default for all residents and businesses has had a significant impact on the City's greenhouse gas emissions. However, rising energy prices and confusing energy bills could potentially reverse progress if more residents move away from the 100 percent carbon-free plan. The City will continue to work with DCE staff to educate community members and discuss the benefits of carbon-free energy.

Local Measures – Transportation

LT-1 EV Charging Infrastructure

Advance and support the adoption of EVs through charging infrastructure.

Transportation is one of the largest sources of GHG emissions due to the burning of fossil fuels in vehicles. EVs offer an alternative, lower-carbon mode of personal transportation for many because it relies on electricity for power rather than fossil fuels. To encourage the transition to EVs, the City of Indio and the City of Palm Springs have identified the expansion of charging station infrastructure as measures in their climate action plans. CVAG's EV Readiness Plan also helps to support and accelerate the mass deployment of plug-in electric vehicles throughout the region.

Local Measures – Waste

LW-1 Solid Waste Diversion and Recycling

Reducing waste in landfills.

The Cities of Coachella and Palm Springs are committing to minimizing the GHG emissions associated with solid waste. By reducing the amount of solid waste, through reducing consumption, reusing and fixing products, and recycling items that cannot be salvaged, the amount of GHG emissions that occur from waste disposal and processing can also be reduced. Coachella strives for zero waste landfills and is facilitating composting opportunities for residents and businesses. In addition, they are providing electronic waste recycle locations and sponsoring solid waste educational programs and diversion strategies. Palm Springs has a goal to divert 90 percent of waste from landfills and is focusing specifically on organic waste.

CHAPTER 5 – LIDAC and Co-benefits Analysis

Although climate change affects all communities, its impacts are not distributed equally. Low-income and disadvantaged communities (LIDACs) are likely to be at greater risk from climate change hazards, including air pollution, wildfires, extreme heat and drought conditions, and other impacts that exacerbate inequities and affect the capacity to adapt. This chapter identifies LIDACs in Riverside−San Bernardino−Ontario MSA through the Council on Environmental Quality's (CEQ) Climate and Economic Justice Screening Tool (CEJST). This is supplemented with LIDAC identification through the U.S. EPA's EJScreen: Environmental Justice Screening and Mapping Tool and the California Protection Agency's (CalEPA) Priority Population Investments 4.0 Map, to provide a greater understanding of LIDACs in Riverside and San Bernardino Counties, the indicators used to identify LIDACs, and the direct and indirect impacts of climate action to LIDACs. This chapter also provides a vulnerability assessment to climate change and a preliminary analysis of anticipated benefits for LIDACs as a result of implementing greenhouse gas (GHG) reduction measures in the PCAP.

LIDAC Engagement

An important aspect of the PCAP development process was outreach to LIDACs. See **Appendix F** for a summary of these engagement efforts. The engagement process focused on identifying existing strategies and actions that offer significant benefits for LIDACs, either directly or indirectly.

LIDAC Identification

CEJST

The CEQ's CEJST tool is used as the primary method for identifying LIDACs in Riverside−San Bernardino−Ontario MSA for Western Riverside Council of Governments (WRCOG), San Bernardino Council of Governments (SBCOG), and Coachella Valley Association of Governments (CVAG).

CEJST identifies LIDACs through various datasets, used as indicators of burdens across 8 categories, shown in **Table 5-1**. Available data at the census tract level helps to identify communities as disadvantaged if they:

- Are at or above the threshold for one or more environmental, climate or other burdens, and
- Are at or above the threshold for an associated socioeconomic burden.

Additionally, census tracts that are completely surrounded by disadvantaged communities and are at or above the 50th percentile for low income are also considered disadvantaged.

Table 5-1
CEJST Categories of Burden

Category	Disadvantaged Community Identification[a] Communities are identified as disadvantaged if they are in census tracts that:
Climate change	Are at or above the 90th percentile for expected agriculture loss rate OR expected building loss rate OR expected population loss rate OR projected flood risk OR projected wildfire risk AND are at or above the 65th percentile for low income
Energy	Are at or above the 90th percentile for energy cost OR PM 2.5 in the air AND are at or above the 65th percentile for low income
Health	Are at or above the 90th percentile for asthma OR diabetes OR heart disease OR low life expectancy AND are at or above the 65th percentile for low income
Housing	Experienced historic underinvestment OR are at or above the 90th percentile for housing cost OR lack of green space OR lack of indoor plumbing OR lead paint AND are at or above the 65th percentile for low income
Legacy pollution	Have at least one abandoned mine land OR Formerly Used Defense Sites OR are at or above the 90th percentile for proximity to hazardous waste facilities OR proximity to Superfund sites (National Priorities List (NPL)) OR proximity to Risk Management Plan (RMP) facilities AND are at or above the 65th percentile for low income
Transportation	Are at or above the 90th percentile for diesel particulate matter exposure OR transportation barriers OR traffic proximity and volume AND are at or above the 65th percentile for low income
Water and wastewater	Are at or above the 90th percentile for underground storage tanks and releases OR wastewater discharge AND are at or above the 65th percentile for low income
Workforce development	Are at or above the 90th percentile for linguistic isolation OR low median income OR poverty OR unemployment AND more than 10 percent of people ages 25 years or older whose high school education is less than a high school diploma

NOTE:

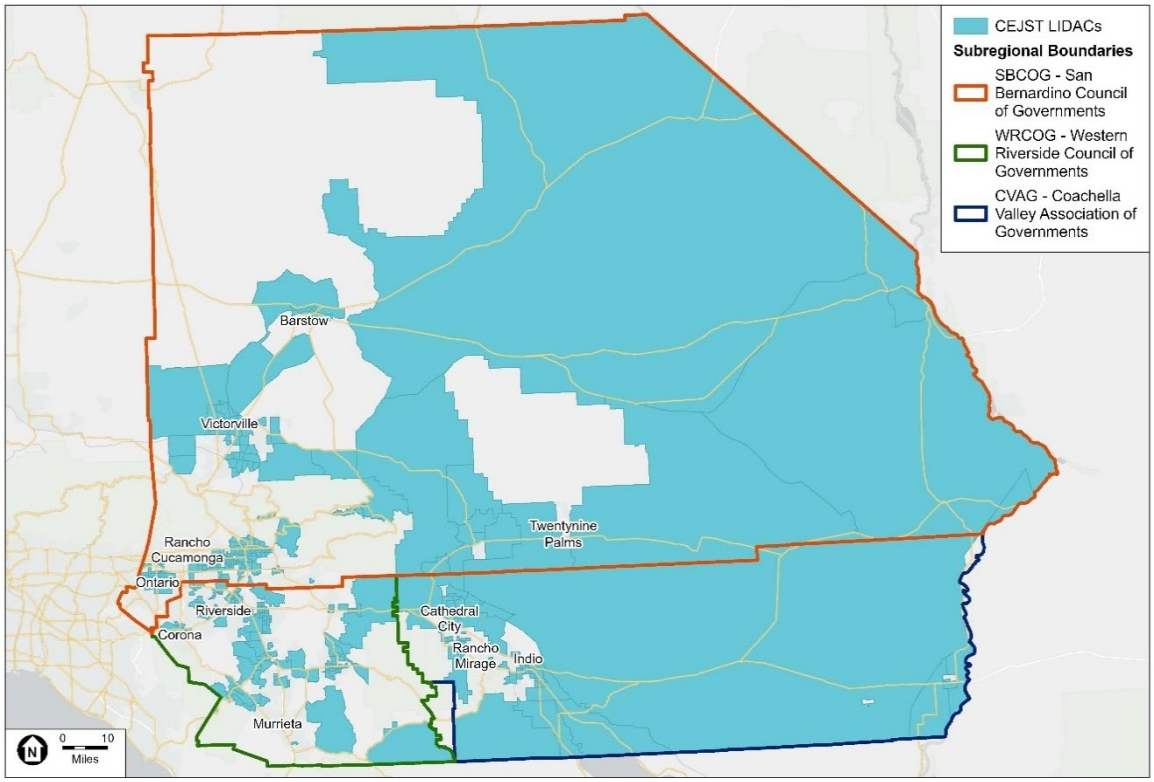
a. Census tracts are considered low income if the percent of the population's household income is at or below 200 percent of the Federal poverty level.

SOURCE: CEQ, 2022 (https://screeningtool.geoplatform.gov/en/methodology#green-space).

CEJST LIDACs in the Region

Between WRCOG, SBCOG, and CVAG there are a total of 913 census tracts, of which 378 or 41 percent are designated as LIDACs. In WRCOG, 133 census tracts or 36 percent qualify as LIDACS; in SBCOG this number is 183, or 44 percent. Although CVAG has the smallest number of census tracts (62), it has the highest proportion of LIDACS at 49 percent. CEJST LIDACs are shown in **Figure 5-1**. Not all LIDACs are contained within high population-dense areas. LIDACs include rural and open space land further northeast, as well as more urban areas in western Riverside and San Bernardino counties.

Figure 5-1 CEJST LIDACs in Riverside−San Bernardino−Ontario MSA



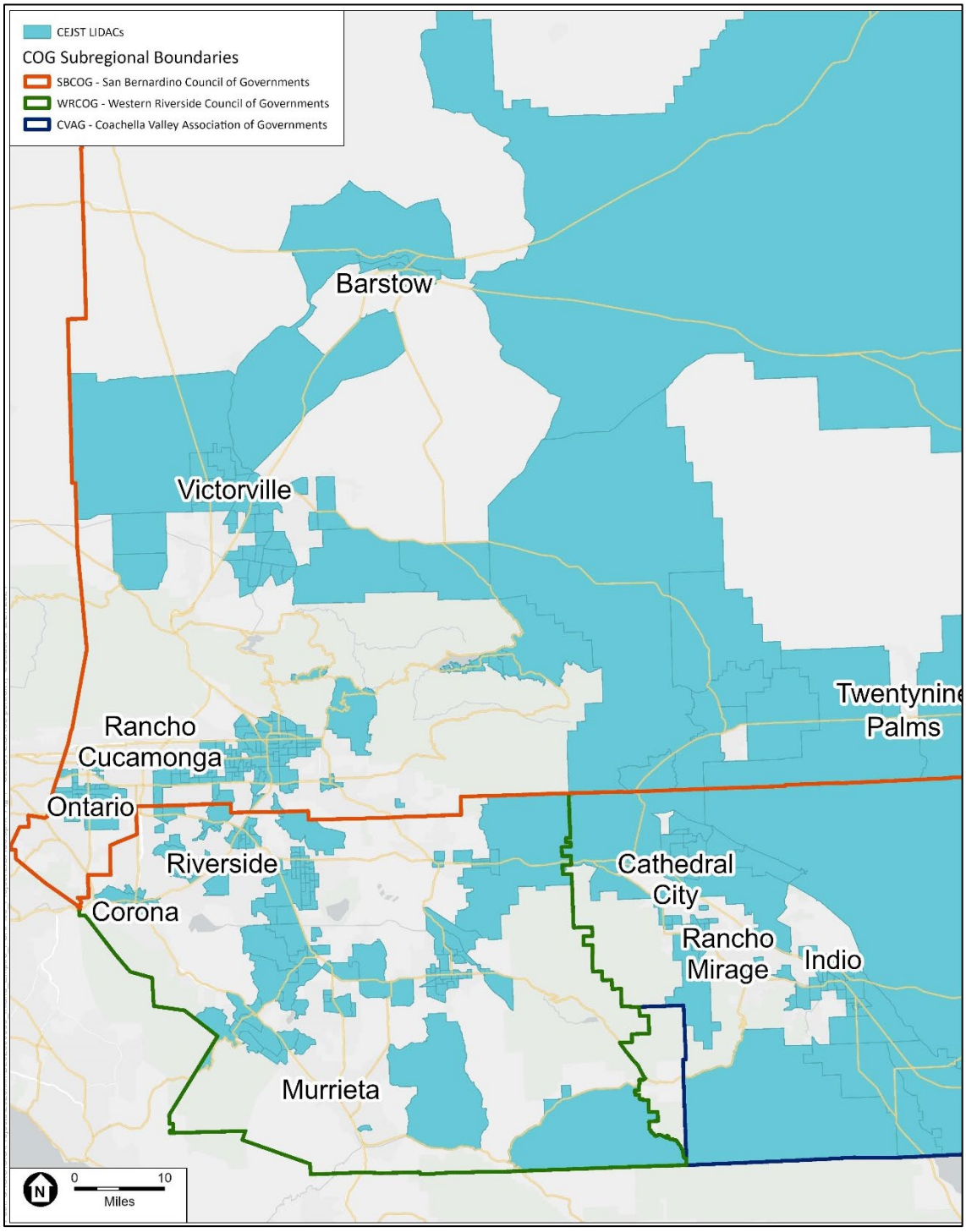
SOURCE: CEJST, 2023; ESA, 2024

In the Inland Empire, most of the population is clustered to the west within more urban cities of Fontana, Moreno Valley, Ontario, Rancho Cucamonga, Riverside, and San Bernardino (Census Bureau, 2023). [47] There are also population density cluster cities further inland, including the cities of Barstow, Indio, Twentynine Palms, and Victorville. LIDACs within western Riverside and San Bernardino counties are shown in closer detail in **Figure 5-2**, where there is greater population density.

Table 5-2 shows the number and percent of census tracts that meet CJEST's criteria for qualifying as a LIDAC within the Riverside−San Bernardino−Ontario MSA. The full list of CEJST LIDAC census tracts is provided in Appendix D to this document. The CJEST indicators with the highest percentages across WRCOG, SBCOG, and CVAG LIDACs include the share of properties at risk of fire in the next 30 years and is low-income, under the Climate Change category; households in linguistic isolation and are low-income, under the Workforce Development category, and share of unemployment and low high-school attainment, under the Workforce Development category. For properties at risk of fire in 30 years and are low-income, CVAG ranks the highest at 18 percent of census tracts, followed by WRCOG with 20 percent and SBCOG with 13 percent. For households in linguistic isolation, the highest percentage of tracts are in CVAG with 27 percent, followed by SBCOG with 12 percent, and WRCOG with 9 percent. Similarly for unemployment and low high-school attainment, the highest percentage of

47 Population density is expressed as persons per square mile (Census Bureau, 2023).

Figure 5-2 CEJST LIDACs in the Western part of the Riverside−San Bernardino−Ontario MSA`



SOURCE: CEJST, 2023; ESA, 2024

Table 5-2
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
Climate Change						
Greater than or equal to the 90th percentile for expected agriculture loss rate and is low income	0	0.0%	3	0.7%	0	0.0%
Greater than or equal to the 90th percentile for expected building loss rate and is low income	24	6.6%	14	3.3%	3	2.3%
Greater than or equal to the 90th percentile for expected population loss rate and is low income	0	0.0%	2	0.5%	0	0.0%
Greater than or equal to the 90th percentile for share of properties at risk of flood in 30 years and is low income	13	3.6%	12	2.9%	11	8.6%
Greater than or equal to the 90th percentile for share of properties at risk of fire in 30 years and is low income	72	19.7%	53	12.6%	23	18.0%
Energy						
Greater than or equal to the 90th percentile for energy burden and is low income	2	0.5%	15	3.6%	15	11.7%
Greater than or equal to the 90th percentile for PM2.5 exposure and is low income	90	24.6%	115	27.4%	0	0.0%
Health						
Greater than or equal to the 90th percentile for asthma and is low income?	0	0.0%	10	2.4%	0	0.0%
Greater than or equal to the 90th percentile for diabetes and is low income	6	1.6%	11	2.6%	5	3.9%
Greater than or equal to the 90th percentile for heart disease and is low income	12	3.3%	10	2.4%	11	8.6%
Greater than or equal to the 90th percentile for low life expectancy and is low income	9	2.5%	12	2.9%	3	2.3%
Housing						
Tract experienced historic underinvestment and remains low income	0	0.0%	0	0.0%	0	0.0%
Greater than or equal to the 90th percentile for housing burden and is low income?	37	10.1%	49	11.7%	19	14.8%
Greater than or equal to the 90th percentile for share of the tract's land	0	0.0%	0	0.0%	2	1.6%

Table 5-2
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
area that is covered by impervious surface or cropland as a percent and is low income?						
Share of homes with no kitchen or indoor plumbing (percentile)	16	4.4%	17	4.1%	7	5.5%
Legacy Pollution						
There is at least one abandoned mine in this census tract and the tract is low income.	0	0.0%	0	0.0%	0	0.0%
There is at least one Formerly Used Defense Site (FUDS) in the tract and the tract is low income.	4	1.1%	13	3.1%	3	2.3%
Greater than or equal to the 90th percentile for proximity to hazardous waste facilities and is low income?	16	4.4%	19	4.5%	1	0.8%
Greater than or equal to the 90th percentile for proximity to superfund sites and is low income?	29	7.9%	16	3.8%	0	0.0%
Greater than or equal to the 90th percentile for proximity to RMP sites and is low income?	13	3.6%	26	6.2%	14	10.9%
Transportation						
Greater than or equal to the 90th percentile for diesel particulate matter and is low income?	15	4.1%	42	10.0%	0	0.0%
Greater than or equal to the 90th percentile for DOT transit barriers and is low income?	32	8.7%	36	8.6%	4	3.1%
Greater than or equal to the 90th percentile for traffic proximity and is low income?	22	6.0%	23	5.5%	0	0.0%
Water and Wastewater						
Greater than or equal to the 90th percentile for leaky underground storage tanks and is low income?	3	0.8%	0	0.0%	2	1.6%
Greater than or equal to the 90th percentile for wastewater discharge and is low income?	14	3.8%	6	1.4%	0	0.0%
Workforce Development						
Greater than or equal to the 90th percentile for households in linguistic isolation and has low HS attainment?	32	8.7%	49	11.7%	34	26.6%
Greater than or equal to the 90th percentile for low median household income as a percent of area median income and has low HS attainment	13	3.6%	29	6.9%	22	17.2%

Table 5-2
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
Greater than or equal to the 90th percentile for households at or below 100% federal poverty level and has low HS attainment?	15	4.1%	33	7.9%	12	9.4%
Greater than or equal to the 90th percentile for unemployment and has low high school attainment?	45	12.3%	68	16.2%	26	20.3%

SOURCE: CEQ, 2022.

tracts are in CVAG, followed by SBCOG with 16 percent, and WRCOG with 12 percent. Housing burden and low income are also high indicators, with the highest count of tracts in CVAG with 15 percent, followed by SBCOG with 12 percent, and WRCOG with 10 percent.

Other significant indicators above the 90th percentile, though not across WRCOG, SBCOG, and CVAG altogether, include exposure to fine particulate matter (PM 2.5) and low income, under the Energy category; exposure to diesel particulate matter (diesel PM) and low income, under the Transportation category, and; low median income and low high-school attainment, under the Workforce Development category. Exposure to PM 2.5 is the top CJEST indicator for both WRCOG and SBCOG, at 25 percent and 27 percent, respectively. The highest percentage of tracts for diesel PM exposure is in SBCOG, with 10 percent. The highest percentage of tracts for low median income and low high-school attainment is in CVAG, at 17 percent.

U.S. EPA EJScreen

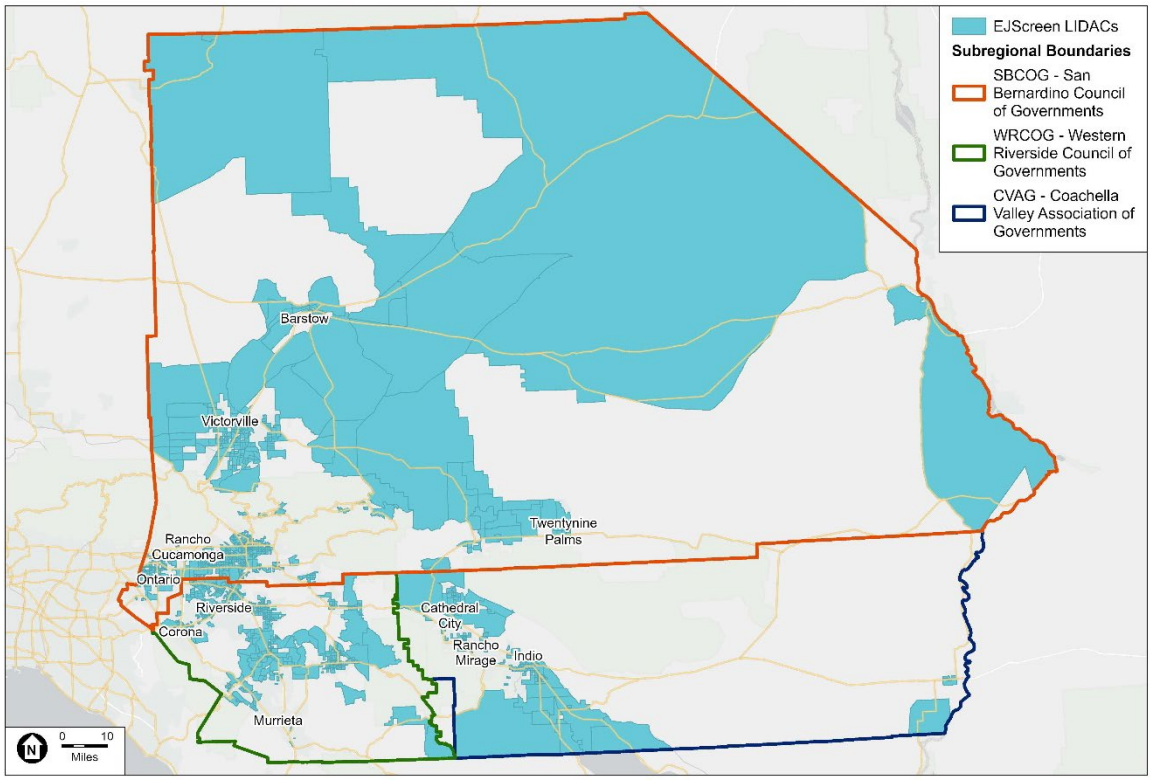
Data from the U.S. EPA's EJScreen is included in this section as a supplement to CEJST data for identifying LIDACs in the Inland Empire region. EJScreen identifies LIDACs as any census block group that is at or above the 90th percentile for 13 Supplemental Indexes when compared to the nation or state:

- PM 2.5
- Ozone
- Diesel PM
- Air Toxics Cancer Risk
- Air Toxics Respiratory Hazard Index
- Toxic Releases to Air
- Traffic Proximity
- Lead Paint
- Risk Management Plan (RMP) Facility Proximity

- Hazardous Waste Proximity
- Superfund Proximity
- Underground Storage Tanks, and
- Wastewater Discharge (USEPA, 2023).

EJScreen combines environmental indicators with socioeconomic indicators to identify percentiles for block groups. Socioeconomic indicators include percentage of low income, percentage of unemployed, percentage of limited English speakers, percentage of less than high school education, and low life expectancy. Block groups that have the highest intersection (above the 90th percentile) between both environmental and socioeconomic indicators are designated as LIDACs (EPA, 2023). **Figure 5-3** shows the LIDAC block groups in Riverside and San Bernardino Counties identified through EJScreen.

Figure 5-3 EJScreen LIDACs in Riverside−San Bernardino−Ontario MSA



SOURCE: EJScreen, 2023; ESA, 2023

Within the Riverside−San Bernardino−Ontario MSA, there are a total of 2,802 block groups, of which 1,298 or 46 percent are identified as LIDACs using EJScreen. The highest number of LIDAC block groups are within SBCOG, with 702, or 52 percent of that subregion's total. CVAG has 156 block groups or 42 percent that are identified as LIDAC, and WRCOG has 440 block groups or 41 percent. For WRCOG, CVAG, and SBCOG, ozone is the top EJScreen indicator for LIDACs with 41 percent, 20 percent, and 50.2 percent, of block groups being in the 90th percentile, respectively. Each of these COGs has a high proportion of block groups in the 90th percentile for hazardous waste proximity; for this indicator 18 percent of WRCOG LIDACs, 18

percent of CVAG LIDACs, and 25 percent of SBCOG LIDACs are above the 90th percentile for proximity to hazardous waste. Notable also is the indicator for fine particulate matter (PM 2.5) which shows 23 percent of WRCOG LIDACs and 29 percent of SBCOG LIDACs above the 90th percentile for this environmental hazard. **Table 5-3** provides the count and percentages for block groups in WRCOG, SBCOG, and CVAG by EJScreen's Supplemental Indexes.

Table 5-3
EJScreen LIDACs (Block Groups) in Inland Empire

Indicators	WRCOG		CVAG		SBCOG	
	Count	Percentage	Count	Percentage	Count	Percentage
Percentile for Particulate Matter 2.5 Supplemental Index	248	22.9%	0	0.0%	390	29.1%
Percentile for Ozone Supplemental Index	439	40.5%	151	40.1%	674	50.2%
Percentile for Diesel particulate matter Supplemental Index	126	11.6%	12	3.2%	291	21.7%
Percentile for Air toxics cancer risk Supplemental Index	120	11.1%	0	0.0%	268	20.0%
Percentile for Air toxics respiratory HI Supplemental Index	136	12.6%	3	0.8%	305	22.7%
Percentile for Toxic Releases to Air Supplemental Index	28	2.6%	0	0.0%	42	3.1%
Percentile for Traffic proximity Supplemental Index	130	12.0%	46	12.2%	241	18.0%
Percentile for Lead paint Supplemental Index	57	5.3%	23	6.1%	163	12.1%
Percentile for Superfund proximity Supplemental Index	139	12.8%	0	0.0%	279	20.8%
Percentile for RMP Facility Proximity Supplemental Index	95	8.8%	53	14.1%	193	14.4%
Percentile for Hazardous waste proximity Supplemental Index	191	17.6%	67	17.8%	340	25.3%
Percentile for Underground storage tanks Supplemental Index	21	1.9%	24	6.4%	7	0.5%
Percentile for Wastewater discharge Supplemental Index	170	15.7%	21	5.6%	198	14.8%

SOURCE: U.S. EPA, 2023

CalEPA Priority Populations Identification

To support the LIDAC analysis, the analysis includes LIDAC designations used by the state of California to provide a more comprehensive understanding of impacted communities. California state regulations[48] designate LIDACs, or "Priority Populations", based on a combination of

48 California Senate Bill 535 and Assembly Bill 1550

environmental and socioeconomic indicators, similar to those used within the CEJST and EJScreen. These are identified through the state's Priority Populations Investments 4.0 mapping tool, which identifies disadvantaged communities as well as low-income communities (together these are designated "Priority Populations).

Disadvantaged communities are identified through the California Office of Environmental Health Hazard Assessment (OEHHA), based on a pollution burden index. Census tracts that are above the 75th percentile for combined pollution and population indicators are considered disadvantaged. These indicators include:

Pollution Burden Indicators:

- Ozone concentration
- PM 2.5 concentration
- Drinking water contaminants
- Childrens lead risk from housing
- Pesticide use
- Toxic releases from facilities
- Cleanup sites
- Groundwater threats
- Hazardous waste
- Impaired waters
- Solid waste sites

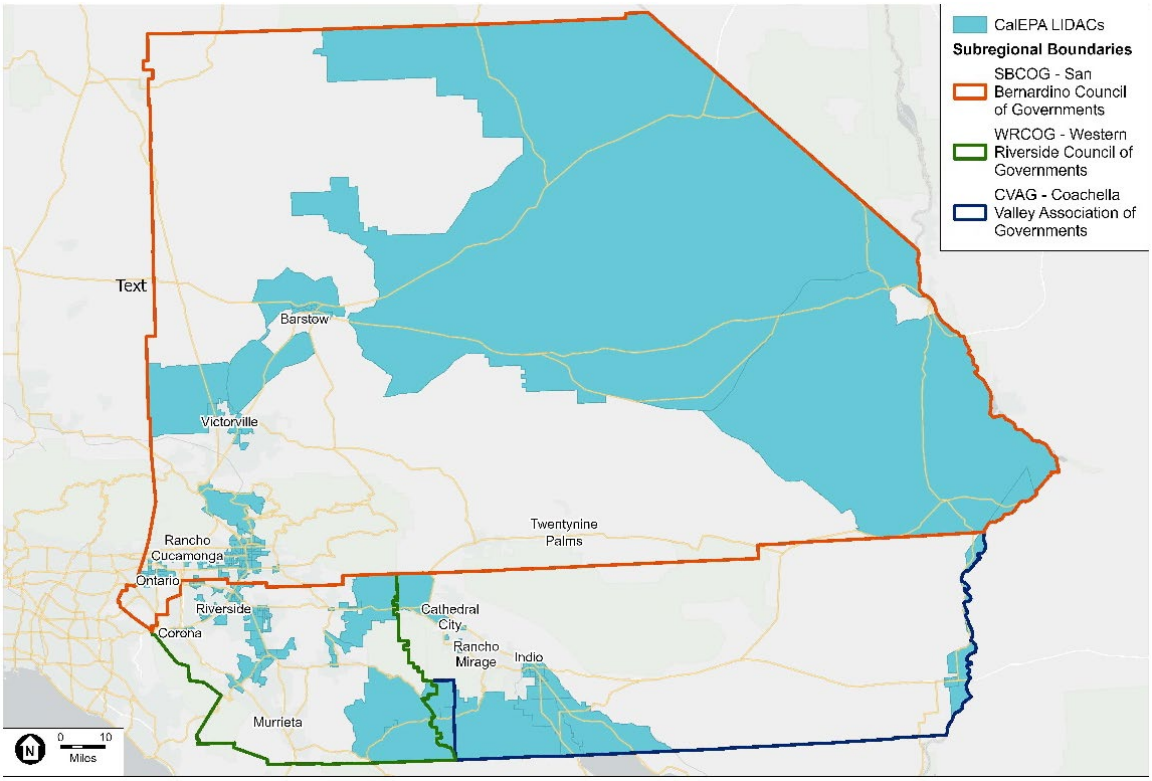
Population Indicators:

- Asthma rate
- cardiovascular disease
- low birth weight of infants
- housing burden
- linguistic isolation
- poverty unemployment.

Separately, low-income census tracts are identified as those that are at or below 80 percent of the state's median income, or at or below the thresholds designated as low income by the California Department of Housing and Community Development.

Figure 5-4 shows the census tracts within the Inland Empire that are identified as Priority Populations through CalEPA's criteria. Of the total 913 census tracts in WRCOG, CVAG, and SBCOG, 236 of these or 26 percent are designated Priority Populations. By percentage, the

Figure 5-4 CalEPA Priority Populations in Riverside−San Bernardino−Ontario MSA



SOURCE: CCI, 2023; ESA, 2024

highest amount of census tracts designated as Priority Populations are in SBCOG, with 125 census tracts or 30 percent of the total. The second highest is CVAG with 31 census tracts designated, or 24 percent. WRCOG has 80 census tracts, or 22 percent.

Vulnerability Assessment

The following section presents a vulnerability assessment to describe the increased risk faced by LIDACs to the effects of climate change hazards, including increased air pollution, extreme heat and extreme temperatures, flooding, drought, and wildfires.

Air Pollution

The impacts of climate change combined with the region's unique geographic and environmental conditions are likely to contribute to worsening air quality in the future. Positioned downwind of the Los Angeles metropolitan area and surrounded by high mountain ranges, the San Bernardino valley region is subject to some of the most significant air quality issues in the United States. Similarly, the Western Riverside and Coachella Valley subregions, located north of the Salton Sea, typically experience high levels of ozone and particle pollution, and may experience worsening conditions due to increasing airborne dust (Hopkins, 2018).

Rising levels of air pollution from primary pollutants – ozone, PM 2.5 and diesel PM – is contingent on various factors, including local and regional emission rates, temperature, wind patterns, and wildfire severity. Regional wildfires are expected to become more frequent and severe in the coming decades and cause worsening pollution due to far-ranging smoke impacts (CNRA, 2018).

Ozone

Climate change directly contributes to rising global temperatures that can have adverse effects on the natural environment. Rising temperatures can exacerbate ground-level ozone formation and intensify the 'heat island' effect in urban areas. Ozone pollution is largely attributed to trucks, cars, planes, trains, industrial facilities, agricultural operations, construction sites, and dry cleaning (OEHHA, 2021). Levels of ozone tend to peak in the afternoon and on hot days. Exposure to ozone, even at low levels, can lead to a variety of negative health impacts, such as lung irritation, inflammation, and the worsening of chronic illnesses. Sensitive groups are particularly vulnerable to the effects of ozone, including children, older adults, outdoor workers, and individuals who spend extended periods outdoors.

Inland Empire communities typically have some of the highest levels of ozone pollution in Southern California (SCAQMD, 2022) and exceed state and/or federal ozone standards. Most of San Bernardino County and eastern Riverside County are within the Mojave Desert Air Quality Management District (MDAQMD). The non-desert portions of Riverside County (Riverside County portion of the Mojave Desert Air Basin and Salton Sea Air Basin, or Coachella Valley) and San Bernardino County (southwestern corner of San Bernardino County) are within the South Coast Air Quality Management District (SCAQMD). Ozone concentrations in SCAQMD exceed both California Ambient Air Quality Standards (AAQS) and National Ambient Air Quality Standards (NAAQS). The northwestern and central MDAQMD region[49] is in nonattainment for NAAQS for ozone; the north, east, and southern areas of the MDAQMD region, including the CVAG subregion, is either in attainment or unclassified for NAAQS for ozone (CARB, 2022).

Ozone pollution is not assessed within the CEJST. However, Resilient IE (WRCOG, 2020) describes projections for both San Bernardino and Riverside counties. Ozone pollution and high ozone days are anticipated to increase by 2050; San Bernardino County could experience more than 7 additional days per year with unhealthy ozone levels by 2050, and ozone pollution in Western Riverside County is projected to increase by 5 to 10 parts per billion (ppb) by 2050 (WRCOG, 2020).

Fine Particulate Matter (PM 2.5)

Fine particulate matter or PM 2.5 refers to a mixture of tiny airborne particles made up of organic chemicals, dust, soot, and metals. Each particle is less than 2.5 micrometers in diameter, smaller than the width of a human hair. PM 2.5 particles originate from various sources, including vehicles, factories, wood burning, and other human activities. This pollution poses significant risk to human health as the small particle size can penetrate deep into the lungs, leading to a range of

49 Includes western Riverside County and southwestern corner of San Bernardino County that are not within SCAQMD.

health issues including heart and lung disease. Children, older adults, and individuals with asthma or other existing lung or heart disease are most susceptible to the adverse effects of PM 2.5 (OEHHA, 2021).

The MDAQMD region that includes the majority of San Bernardino County and eastern Riverside County is in attainment for state standards (AAQS) and in attainment and/or unclassified for national standards (NAAQS) for PM 2.5 (CARB, 2022). The SCAQMD region that includes the non-desert areas of Riverside County and San Bernardino County is in nonattainment for both AAQS and NAAQS.[50]

According to the CJEST, 25 percent of WRCOG census tracts have a percentile greater than or equal to 90 for PM 2.5 exposure and are also low income. In SBCOG this number is 27 percent, and in CVAG there are no census tracts that are greater than the 90th percentile for PM 2.5 and are also low income (CEQ, 2022).

Diesel Particulate Matter (diesel PM)

Diesel particulate matter comes from the exhaust of trucks, buses, trains, ships, and other equipment powered by diesel engines. This kind of particulate matter consists of a mixture of gases and solid particles that encompass a wide array of chemicals. Diesel PM is found in greater concentrations near ports, rail yards, and highways. Similar to PM 2.5, diesel PM particles can travel deep into the lungs and cause health problems including eye, throat, and nose irritation, heart and lung disease, and lung cancer. Children and older adults are more sensitive to the adverse effects of diesel PM exposure (OEHHA, 2021).

Of census tracts in the Riverside−San Bernardino−Ontario MSA, SBCOG has the highest percentage of tracts (10 percent) that are both low income and in the 90th percentile for diesel PM. WRCOG has 4 percent of census tracts which fall into this category while CVAG has no tracts that are above the 90th percentile for diesel PM and are low income (CEQ, 2022).

Vulnerabilities

Increasing concentrations of ozone, PM 2.5, and diesel PM are expected to pose significant health risks for more sensitive groups in the Inland Empire. These groups include children, older adults over age 65, individuals with existing health conditions, individuals without reliable access to health care, pregnant individuals, outdoor workers, and people experiencing homelessness. Air pollution negatively impacts health outcomes by contributing to chronic disease and respiratory issues, such as asthma, pulmonary disease, pneumonia, and bronchitis. It can also affect cardiovascular health, leading to heart disease, heart failure, and cardiac arrest. Other factors that contribute to poor air quality, such as extreme heat events or wildfires, may require shelter-in-place practices that can disrupt daily routines, affect work and school attendance, as well as individual and household incomes, and mental and physical health.

50 Includes western Riverside County and southwestern corner of San Bernardino County that are not within SCAQMD.

Extreme Heat

Inland Empire residents are familiar with warmer conditions due to the region's desert-like environments and Mediterranean and semi-arid climate known for hot and dry summers. The built environment is generally designed to withstand warmer temperatures. However, climate change will bring a new "normal" characterized by increased average and maximum temperatures, alongside more frequent and intense extreme heat days that persist for extended durations. Historically in San Bernardino County and Riverside County, extreme heat days averaged 4 days from 1961−1990 (Cal-Adapt, 2018). For San Bernardino and Riverside Counties, on average this is expected to increase to 27 additional extreme heat days per year by mid-century under a Medium Emissions (RCP 4.5) Scenario (Cal-Adapt, 2018). The urban heat island effect is also expected to further exacerbate these conditions in more heavily urban areas. In these areas the high density of buildings, paved roads, and other high albedo and impermeable surfaces absorb and re-emit the sun's heat with greater intensity, resulting in higher daytime and nighttime temperatures.

These conditions have the potential to impact public health, air pollution, energy demand and costs, water resources, and natural lands and wildlife. Specific to public health, higher temperatures can increase risk for heat-related illnesses, such as heat exhaustion and heat stroke, and worsen existing cardiovascular and respiratory illnesses. Severe cases, such as heat stroke, can impact mental health and lead to missed school and workdays, cause stress, aggression, fatigue, confusion, coma, and even death. Extreme heat is the cause of more deaths per year on average than all other weather-related hazards in the United States combined (Bedsworth, 2018). There were over 10,000 heat-related deaths recorded in the U.S. from 2004 to 2018 (USEPA, 2022). In 2006, a prolonged heat wave in California killed over 600 people and resulted in 1,200 hospitalizations and 16,000 emergency department visits (CNAP, 2015).

Flooding

While annual average precipitation levels are expected to decrease in Southern California, the severity of individual precipitation events is likely to increase, increasing the risk from urban flooding, riverine flooding, and landslides and mudslides (WRCOG, 2020). Additionally, the Inland Empire's unique topography makes it susceptible to flooding. Existing designated floodplains within SBCOG are also expected to expand, reflecting increased flood risk to infrastructure for energy transmission, stormwater draining, and transportation. More frequent and severe flooding can affect critical and emergency services, evacuation routes, and emergency response. It can also result in property damage, population displacement, injuries, and economic impacts on agriculture. Prolonged flooding can lead to increased mold, contributing to respiratory health issues. There is also potential for stagnant waters to facilitate transmission of vector-borne diseases, such as West Nile virus.

Based on data from CJEST, 4 percent of census tracts in WRCOG fall at or above the 90th percentile of properties at risk of a flood in the next 30 years and are low income. In SBCOG, slightly fewer census tracts fall into this category at 3 percent. In CVAG, 9 percent of tracts fall into this category (CEQ, 2022).

Vulnerabilities

Flooding can have a particularly negative effect on vulnerable populations, including individuals experiencing homelessness, older adults over age 65 and living alone, and rural residents who rely heavily on transportation infrastructure (WRCOG, 2020). Other vulnerable groups include those without access to a car, children, and individuals with disabilities. Rural populations face increased risk from potential flash floods that can occur in remote desert areas. For farmers and agricultural workers, there is an increased risk of displacement and economic loss due to potential damage to crops and other agricultural equipment.

Homes, buildings, and roadways are also at risk, especially if they are not built for precipitation and flooding hazards. Damage to property disproportionately affects low-income communities as these households often lack financial resources essential for rebuilding after a flood.

Flooding can also result in extreme air quality impacts, as evidenced by the aftermath of the flooding from Tropical Storm Hilary in 2023. The erosion of topsoil, mudflows, and dirt deposits resulted in high levels of particulate matter in the air, leading to unhealthy to hazardous air quality index values in Coachella Valley, which was highly unusual for that time of year.

Drought

Southern California has long experienced periods of drought, however, with climate change droughts are expected to occur more frequently, more intensely, and for longer durations than the region's historical norms. More severe and prolonged drought can affect reliability and quality of water supplies, leading to shortages that can affect water prices, costs for food, and water security. Dry conditions increase the region’s susceptibility to wildfires and poor air quality. Additionally, stress on vegetation and trees can increase pests and diseases that contribute to plant mortality, and further increase wildfire risks. Communities that rely on agriculture may face significant economic challenges as crops are threatened by these adverse conditions.

Vulnerabilities

Agricultural workers and low-income households may be disproportionately affected by drought, due to impacts on working lands, water shortages, water limits, and increases in costs for water. Individuals and families that depend on income from agriculture, including immigrant communities and seasonal workers will be most affected by these conditions.

Wildfires

Climate change creates more favorable conditions for frequent wildfires and prolonged fire seasons, due to warming global temperatures, drought and dry conditions, and loss of vegetation from these factors. Regional wildfires can significantly affect air quality due to large amounts of carbon dioxide, black carbon, brown carbon, and ozone precursors that are released into the atmosphere (NOAA, 2018). Wildfire smoke can travel long distances and impact communities far removed from fire sites.

In the Inland Empire, wildfire is a natural hazard that has a high probability of occurring and represents one of the greatest risks to life and property (WRCOG, 2020). The mountain regions of the Inland Empire in particular are expected to see increases in wildfire events by mid-century.

In WRCOG 20 percent of low-income census tracts are in the 90th percentile for properties at risk of fire in the next 30 years and are low income. In the CVAG subregion, the figure is slightly lower at 18 percent, while in SBCOG it is 13 percent (CEQ, 2022).

Vulnerabilities

The increasing frequency and severity of wildfires can disproportionately affect low-income residents, individuals with disabilities or mobility issues, individuals without access to health care, individuals without access to a vehicle, children under age 5, adults over age 65 and who live alone, linguistically isolated individuals, and people experiencing homelessness. These groups may have greater difficulty with evacuations during wildfire threats, due to limited financial resources, unreliable transportation, or language barriers during emergencies.

As wildfires also contribute to heightened air pollution, there is higher risk to outdoor workers and individuals with pre-existing health conditions. For communities that are safe distances away from active fires, there may still be impacts from wildfire smoke that requires sheltering indoors, affecting outdoor workers, active commuters, and individuals experiencing homelessness. Agricultural workers face heightened risks of economic loss resulting from potential damage to crops and reduced work opportunities. Agricultural workers, low-income individuals and households, and individuals who are out of the workforce may face additional challenges in recovering from property losses caused by wildfires, including potential limitations in accessing financial resources and support services.

Summary of Vulnerabilities

The compounding impacts of climate change, including worsening air quality, extreme heat, flooding, drought, and wildfires, pose significant and disproportionate challenges for vulnerable populations who already face socioeconomic disparities. Poor air quality will pose greater threat to public health, especially for children, older adults, and those with existing health concerns. Extreme heat amplifies the risk of heat-related illnesses and increases demand and cost for energy resources. Flooding and wildfires increase the threat of displacement and exacerbate challenges for communities with limited resources for adaptation and response.

Co-Benefits to PCAP Measures

Identifying LIDACs and understanding their climate change vulnerabilities allows for targeted and equitable planning to ensure adopted measures are tailored to address specific challenges. Many of the measures identified in this PCAP provide additional social, economic, or environmental advantages to LIDACs in addition to reducing GHG emissions. The primary goal of the co-benefits assessment is to qualitatively identify the indirect benefits (co-benefits) that the PCAP measures could provide in areas such as public health, economic development, resource allocation, and others. This information is crucial in empowering communities to assess the

advantages specific to their jurisdictions when evaluating and prioritizing measures to reduce GHG emissions. These co-benefits directly impact the well-being, awareness, and resilience of communities. Co-benefits evaluated for this PCAP are described below.

Air Pollution

The PCAP includes GHG reduction measures that will result in enhanced air quality for LIDACs. As outlined in the Vulnerability Assessment, San Bernardino and Riverside counties face a high air pollution burden compared to national averages. LIDACs in these counties are exposed to air pollution at significantly higher rates and possess fewer resources to shield themselves from its effects. Implementing GHG reduction measures that reduce air pollution will help alleviate existing burdens on LIDACs. Communities that bear a disproportionate burden of PM 2.5, Diesel PM, ozone, and fugitive emissions will experience fewer harmful pollutant exposures, leading to improved health outcomes through a reduction in respiratory, cardiovascular, and other health-related issues.

Other Pollution

Various activities involved in the extraction, refining, transportation, and storage of fossil fuels have the potential to cause soil and groundwater contamination due to leaks, spills, and other discharges along the entire supply chain. LIDACs are often faced with increased exposure to hazardous pollution resulting from such incidents. GHG reduction measures that facilitate the transtion from fossil fuels to renewable energy sources can help alleviate these inequitable burdens.

Public Health

Measures aimed at reducing GHG emissions can have broader public health benefits beyond lower pollution levels. For example, initiatives focused on decreasing vehicle travel by improving bicycle networks can promote increased physical activity, leading to better health outcomes. Additionally, by reducing vehicle travel, such measures can contribute to a decrease in road accidents, decreasing injury and mortality rates. Pollution reduction has significant implications for public health, reducing the risks associated with chronic diseases, respiratory issues, and overall physical and mental well-being. It's important to note that LIDACs, which often face the harshest conditions from pollution and environmental degradation, can particularly benefit from these measures that prioritize public health co-benefits.

Resource Conservation

GHG reduction measures are often tied to greater resource conservation through the prioritization of optimal resource use. The preservation of ecosystems and other natural resources helps ensure they are available for future generations. A key component of this is responsible management and production of resources such as energy, water, waste, and raw materials. LIDACs in particular can benefit from these measures as they are often disproportionally impacted by resource scarcity and environmental

pollution. Reduced energy consumption can lead to lower utility costs, which is particularly beneficial for low-income households that typically spend a higher percentage of their income on energy bills. Sustainable land use practices can lead to the creation of green spaces and healthier living environments, contributing to a higher quality of life in these communities. Additionally, investments in waste reduction initiatives contribute to environmental health and create job opportunities in recycling and waste management sectors, often in areas where low-income groups reside.

Economic Development

Many of the GHG reduction measures in this plan will contribute to economic benefits by generating new opportunities in the form of “green” jobs and improved resource distribution. Measures that promote energy conservation and community resilience drive economic revitalization across a diverse range of sectors, including transportation, agriculture, waste management, and water conservation. Growth in these sectors can provide opportunities for LIDACs in the form of green jobs which often provide skill development and livable wages. The positive effects of these changes extend beyond direct employment in green industries, stimulating greater overall economic activity within communities, even for those not directly engaged in the green sector. A thriving green economy enhances this effect because as green businesses grow, they demand services and goods, stimulating other local businesses and creating a cycle of positive economic growth.

Community Awareness & Capacity Building

A number of the GHG measures presented in this plan center around expanding community awareness of climate change and building capacity for resilience. Educating community members on climate hazards and vulnerabilities lays a foundation for informed action. Enhanced awareness of climate threats increases individual and collective capacity for communities to address climate change in their day-to-day lives, as part of their sustainability activities including commutes, purchases, material discards, and other actions. Residents become more empowered to take action when they are well informed and are also better able to participate directly in planning processes. This also helps to increase local support for cities to invest resources and funding for climate action.

Parks and Urban Greening

Urban greening measures contribute to lower GHG emissions by increasing energy efficiency and reducing the urban heat island effect. Green spaces have been shown to improve mental and physical health outcomes, increase property values, encourage social cohesion, and improve air quality. For LIDAC’s these efforts are particularly beneficial as these communities are often located in environments with fewer green amenities or limited access to green spaces. Urban greening provides aesthetic improvements to the environment and promotes physical activity, improved physical and mental health, placemaking and community gathering, and outdoor recreation. Urban greening measures can improve air quality by producing oxygen and trapping particulate matter and other pollutants on leaf surfaces. Urban greening can also mitigate hazards such as stormwater flooding and the

urban heat island effect, to which low income and disadvantaged communities are particularly vulnerable.

Community Resilience

Measures that promote community resilience can be particularly beneficial to LIDACs, which typically have a lower capacity to adapt to climate change hazards. With fewer resources, LIDACs face greater challenges in anticipating, preparing for, and recovering from climate-related shocks like heat waves, wildfires, and flood events, as well as infrastructure disruptions such as power outages and stormwater system backups. Measures that promote urban greening, energy efficiency, water conservation, and other sustainability benefits not only reduce GHG emissions but also enhance overall community resilience, particularly for LIDACs.

Socioeconomic Equity and Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people, regardless of race or income, in the development, implementation, and enforcement of environmental laws, regulations, and policies. GHG reduction measures that promote environmental justice include those that reduce the disproportionate burden of environmental harm experienced by low income and disadvantaged communities. Socioeconomic equity refers to the fair distribution of resources, opportunities, and privileges within a society, aiming to address and reduce disparities in wealth, income, and access to essential services. LIDACs often bear the brunt of environmental harm, leading to adverse health outcomes and reduced quality of life. Disparities in wealth and access to essential services further exacerbate existing inequalities. Measures that advance socioeconomic equity include those that promote job growth within LIDACs and those that limit impacts on agricultural workers and low-income communities.

GHG Reduction Measure Benefits Analysis

The GHG reduction measures in this plan will bring both direct and indirect co-benefits to LIDACs in the Inland Empire. The three regional measures in the PCAP are assessed individually, while the PCAP's extensive local measures, as outlined in Chapter 4 for CVAG, SBCOG and WRCOG, are grouped into categories that represent an overarching strategy (e.g., Shift to Renewable Energy) to facilitate the co-benefits assessment. Measures within the same strategy are expected to yield similar co-benefits for LIDACs. In some cases, an individual measure has been grouped with more than one strategy.

Table 5-4 summarizes the anticipated LIDAC co-benefits associated with each regional measure and with each local strategy grouping in the PCAP. Qualitative assessments of co-benefits are provided in the following sections.

Table 5-4
GHG Reduction Measures and LIDAC Co-Benefits

	Air Pollution	Other Pollution	Public Health	Resource Conservation	Economic Development	Community Awareness & Capacity Building	Parks and Urban Greening	Community Resilience	Socio-economic Equity and Environmental Justice
Greenhouse Gas Reduction Measures									
Regional Measures									
EV Infrastructure	X	X	X		X	X		X	X
Decarbonize Existing Buildings	X	X	X	X	X			X	
Goods Movement	X	X	X					X	X
Local Strategies									
Building and Appliance Electrification	X	X	X	X	X			X	X
Energy Efficiency and Resilience	X	X	X	X		X		X	X
Green Building and Urban Design	X	X	X	X		X	X	X	X
Shift to Renewable Energy	X	X	X	X	X	X		X	X
Reduce VMT through Land Use Changes	X	X	X			X	X	X	X
Clean Vehicles and Reduced Tailpipe Emissions	X	X	X		X				
Mode Shift	X	X	x		X	X		X	X
Expand and Improve Transit	X	X	X			X			X

Table 5-4
GHG Reduction Measures and LIDAC Co-Benefits

	Air Pollution	Other Pollution	Public Health	Resource Conservation	Economic Development	Community Awareness & Capacity Building	Parks and Urban Greening	Community Resilience	Socio-economic Equity and Environmental Justice
Materials Recycling and Waste Reduction	X	X	X	X	X	X		X	X
Water Conservation			X	X				X	
Expand Community Resilience			X			X		X	X
Promote Sustainable Business Practices			X		X			X	
Expand Carbon Sequestration	X		X				X	X	
Local Agriculture	X		X	X				X	

Regional Measures

Light Duty EV Infrastructure

Expansion of EV infrastructure will help support a faster transition to zero emission vehicles and yield significant GHG reductions locally and regionally, especially for medium- and heavy-duty vehicles. This transition will provide direct co-benefits for improved air quality and public health. Additional indirect benefits encompass lower healthcare costs related to hospital visits for respiratory and cardiovascular conditions, which are frequently exacerbated in populations residing closer to major corridors, as well as decreased noise pollution attributed to ZEVs. This is particularly important for dense, residential clusters located near major roadways and goods movement corridors, where many LIDACs reside. Publicly available EV infrastructure also expands options for personal vehicle ownership.

Decarbonize Existing Buildings

Existing buildings contribute significantly to regional GHG emissions due to their energy needs for heating and cooling. Generally, decarbonizing existing buildings requires a transition to renewable electricity as a primary energy source, along with increased energy efficiency and more reliance on renewable or low-carbon fuels where a shift to electrification is not feasible. Building electrification can provide multiple co-benefits for lower-income and rent-burdened households, including reduced utility bills, better indoor air quality and improved energy resilience.

Decarbonize Goods Movement

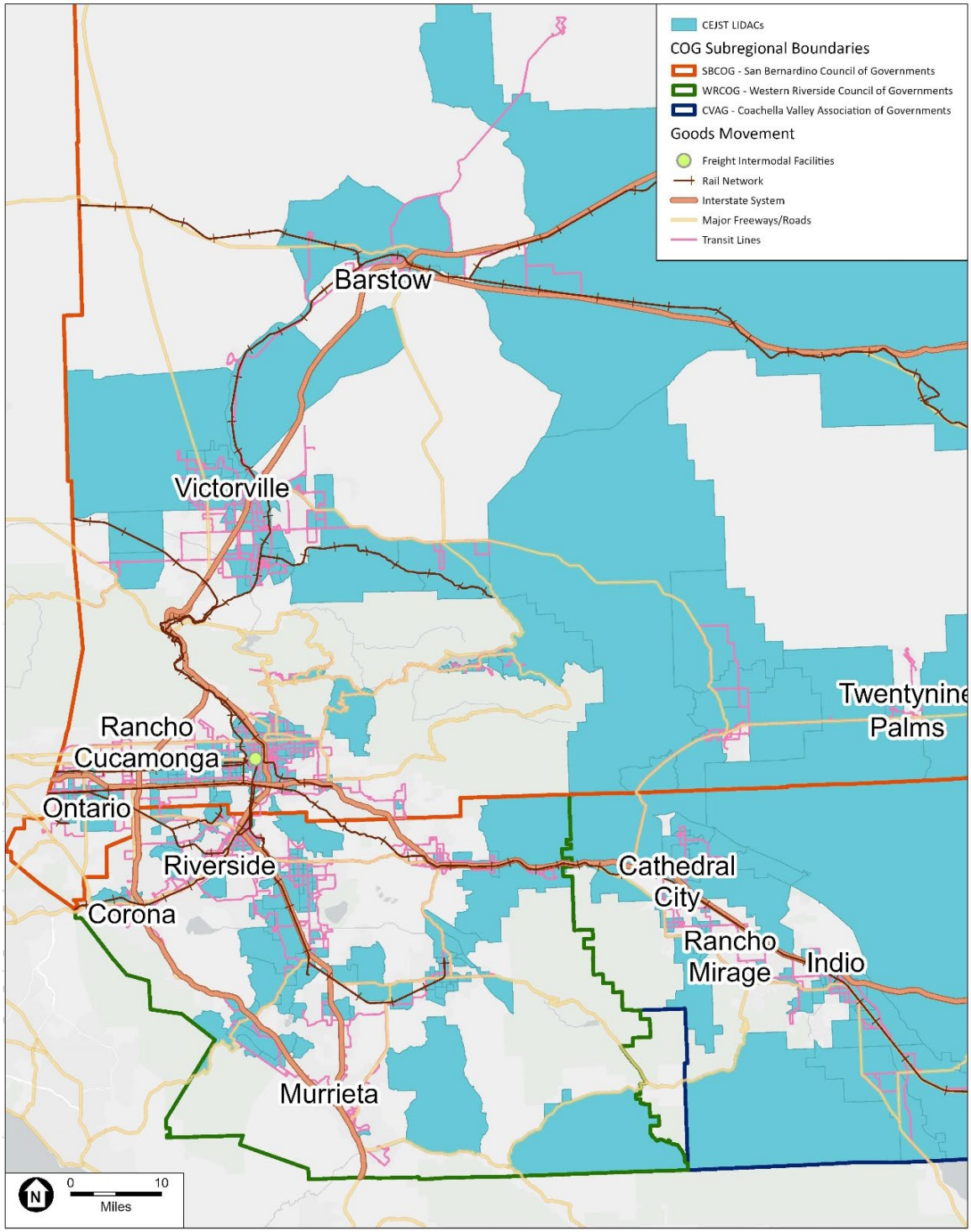
Goods movement is a significant and key marker of Southern California's economy. However, goods movement corridors often traverse LIDAC communities, affecting local and regional air quality and posing significant exposure and risk to public health. LIDACs and goods movement facilities in western Riverside-San Bernardino-Ontario MSA are shown in **Figure 5-5.** Decarbonizing goods movement involves vehicle electrification and a transition to cleaner fuels, which reduces air pollution and leads to improved public health outcomes and reduced healthcare costs for individuals within LIDACs. Moreover, the transition to decarbonized goods movement holds the potential to mitigate noise pollution, fostering a quieter and more pleasant living environment for nearby residents. Ultimately, these co-benefits contribute to the creation of healthier and more resilient communities.

Local Measures

Building and Appliance Electrification

Building and appliance electrification holds several co-benefits for LIDACs. The adoption of electric appliances and systems can lead to significant energy cost savings for residents in these communities. Electric appliances are generally more energy-efficient, reducing utility bills and alleviating the financial burden on low-income households. Additionally, the shift away from fossil fuel-powered appliances, such as gas stoves and water heaters, can contribute to improved indoor air quality and improved health outcomes.

Figure 5-5 CEJST LIDACS and Goods Movement in Riverside-San Bernardino-Ontario MSA



SOURCE: Caltrans, 2024; CEJST, 2023; ESA, 2024

Furthermore, the introduction of reach codes for new buildings that go beyond the state's minimum requirements can result in the construction of more energy-efficient and sustainable housing options for LIDACs. This can translate into more comfortable and healthier living conditions, as well as a decreased reliance on fossil fuels.

The electrification of landscaping equipment and the replacement of older, inefficient appliances with electric alternatives can also promote environmental sustainability and reduce noise pollution in these communities. **Table 5-5** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support building and appliance electrification.

Table 5-5
Building and Appliance Electrification

WRCOG Measures	
WRCOG LE-4	Building and Appliance Electrification
WRCOG LE-8	Reach Codes for New Buildings - Going Beyond Title 24
CVAG Measures	
CVAG	Building Electrification
CVAG	Electric Lawn Equipment
Regional: CVAG	Efficient Pool Pump Installation
Regional: CVAG	Refrigerator, Dishwasher, Clothes Washer or Dryer Replacement
Regional: CVAG	Induction range or cooktop
Regional: CVAG	Electric clothes dryer (heat pump or electric resistance)
Regional: CVAG	Heat pump for space heating and cooling
Regional: CVAG	Heat pump water heater (unitary and central)
Regional: CVAG	HVAC Replacement
Regional: CVAG	Diesel engine conversions
SBCOG Measures	
SBCOG MO-31,32,33	Upgrade Existing Home Appliances
Regional: SBCOG Energy-3	Building Electrification
Regional: SBCOG Off Road-3	Electric Landscaping Equipment

Energy Efficiency and Resilience

The implementation of energy efficiency and resilience measures can result in a variety of co-benefits for LIDACs by way of reducing financial burdens associated with energy costs, improving quality of life in urban and climate-impacted areas, and promoting equitable access to resources. For example, improving energy efficiency of existing buildings, whether residential, commercial, or municipal, can lead to substantial reductions in energy usage and associated bills. This financial relief is particularly impactful for low-income households where utility costs can account for a significant proportion of their monthly budget.

Other measures such as energy efficiency workshops and programs tailored for LIDACs can empower residents with knowledge and skills to manage their energy consumption more

effectively, leading to long-term behavioral changes that contribute to further savings and environmental benefits. Things like upgrades in traffic and street lighting not only enhance community safety but also reduce municipal energy costs, freeing up public funds that can be reinvested in local communities.

The introduction of energy performance targets for new and existing constructions ensures that buildings are not only more cost-effective to maintain but also healthier to live in. Improved insulation, air sealing, and the installation of ENERGY STAR certified appliances and fixtures like ceiling fans and LED bulbs enhance indoor air quality and comfort, reducing health risks associated with poor insulation and ventilation.

Promoting energy efficiency in low-income residents and incentivizing home energy assessments directly engages LIDACs in energy-saving practices. These initiatives, coupled with support for the deployment of new technologies like occupant-controlled smart thermostats and solar window films, ensure that the latest advancements in energy efficiency are accessible to disadvantaged communities.

Additionally, larger infrastructure projects like the Sanitary District WRP Energy Efficiency Project and the Coachella Water Authority Well Site Energy Improvements not only enhance the resilience and efficiency of essential public services but also present opportunities for local job creation and skill development in emerging green sectors. **Table 5-6** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to improve energy efficiency and resilience.

Table 5-6
Improve Energy Efficiency and Resilience

WRCOG Measures	
WRCOG LE-3	Improve Energy Efficiency of Existing Buildings
WRCOG LE-5	Traffic & Street Light Upgrades
CVAG Measures	
CVAG SNE 4, Indio CA 1	Energy Efficiency Workshops/Programs
CVAG SNE 2.9, Indio Existing Policy	Traffic & Street Light Upgrades
CVAG CA 1	Commercial Benchmarking
CVAG CA 1	Municipal Benchmarking
CVAG SNE 2.6	Energy Performance Targets for New Construction
CVAG SNE 2.7, Indio CAP Reductions	Energy Performance Targets for Existing Buildings
CVAG CA 2	Residential Transfer of Title Energy Disclosure
CVAG CA 7	Support Deployment of New Technologies
CVAG Coachella CAP	Commercial and Residential Conservation and Efficiency Ordinance
CVAG	Sanitary District WRP Energy Efficiency Project
CVAG	Incentivize Home Energy Assessments
CVAG	Coachella Water Authority Well Site Energy Improvements
Regional: CVAG	Thermal Bridging Removal

Table 5-6 Improve Energy Efficiency and Resilience	
Regional: CVAG	Duct testing/sealing and/or new ducts, returns and registers
Regional: CVAG	Occupant controlled smart thermostat
Regional: CVAG	Ceiling fans must be ENERGY STAR certified
Regional: CVAG	Air Sealing
Regional: CVAG	Insulation
Regional: CVAG	Solar Window Film
Regional: CVAG	Electrical wiring and panel upsizing
Regional: CVAG	Automatic circuit sharing devices
Regional: CVAG	Remediation and safety
Regional: CVAG	Build on I-REN's Public Sector Program
Regional: CVAG	Attic Fan Installation
Regional: CVAG	HVAC Maintenance Program
Regional: CVAG	Shade: Awning or blackout UV window shades
Regional: CVAG	LED bulbs and fixtures
SBCOG Measures	
SBCOG Energy-1	Energy Efficiency for Existing Buildings: Education and Outreach
SBCOG Energy-2	Promote Energy Efficiency in Low-Income Residents
SBCOG Energy-1	Promote Commercial and Industrial Facility Commissioning
Regional: SBCOG Energy-3	Energy Efficiency for Existing Buildings
Regional: SBCOG Energy-2	Outdoor Lighting
Regional: SBCOG Wastewater-2	Equipment Upgrades

Green Building and Urban Design

The implementation of green building and urban design measures holds numerous co-benefits for LIDACs when tailored to ensure improvements for these communities. The planting of shade trees and the incorporation of cool roofs and pavements can mitigate the urban heat island effect, providing relief from extreme heat during hot summers. This is especially crucial for LIDACs, as they often reside in areas with limited green spaces.

Moreover, the emphasis on green building practices can help ensure that housing in LIDACs becomes more sustainable and affordable in the long term. Energy-efficient structures and the use of renewable materials can lower utility costs, making housing more affordable for low-income individuals and families. Additionally, the creation and preservation of urban forests, parks, open spaces, and rooftop gardens contribute to improved mental and physical well-being by offering recreational opportunities and green spaces for relaxation.

Urban tree planting initiatives and GHG performance standards for new development can further reduce air pollution, mitigate the effects of climate change, and promote healthier communities. Overall, the integration of these green building and urban design measures in a way that prioritizes the needs of LIDACs will result in cooler, more energy-efficient, affordable, and

environmentally friendly neighborhoods. **Table 5-7** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support green building and urban design.

Table 5-7
Green Building and Urban Design

WRCOG Measures	
WRCOG LE-6	Shade Trees
WRCOG LE-7	Cool Roofs and Pavements
CVAG Measures	
CVAG SNE 1.11, 4.6	Shade Trees
CVAG SNE 4.5	Cool Paving
CVAG SNE 2.1,2.2	Passive Solar Design
CVAG Indio CAP Reductions	Promote Green Building
CVAG	Climate Appropriate Design Guidelines
CVAG SNE 4.6, 1.11	Urban Forest
CVAG SNE 13.2-5,13.9,13.10,13.12, 13.14,13.15	Parks and Open Space
SBCOG Measures	
Regional: SBCOG Land Use-1	Promote Rooftop Gardens
Regional: SBCOG Land Use-2	Urban Tree Planting
Regional: SBCOG PS-1	GHG Performance Standard for New Development

Shift to Renewable Energy

Energy production is fundamental for powering essential aspects of daily life, from heating and cooling homes to operating appliances and medical equipment. The transition from fossil fuels to renewable energy offers several co-benefits for LIDAC. For example, traditional energy sources such as coal, oil, and natural gas significantly contribute to GHG emissions and air pollution, impacting both climate change and public health.

The adoption of Community Choice Energy/Green Grid Offerings and the expansion of local renewable energy production can lead to more affordable and accessible clean energy options for LIDAC residents. This can also result in lower electricity bills, reducing the financial strain on low-income households. Similarly, upgrading municipal facilities to incorporate renewable energy not only reduces emissions but can also generate cost savings that the community can reinvest in programs and services. Other benefits can come from the development of alternative energy sources and the utilization of open spaces for renewable energy projects which can create job opportunities within LIDACs, contributing to economic development.

The promotion of Net Zero Buildings and the inclusion of electric charging infrastructure in renewable energy master plans ensure that LIDACs have access to energy-efficient and sustainable housing options and transportation choices, reducing both energy costs and emissions. Measures related to solar installations and on-farm renewable energy generation can provide LIDACs with cleaner and more affordable energy sources.

For low income and disadvantaged communities who often face greater health risks from pollution, renewable energy systems promote environmental justice by providing cleaner air and economic benefits in the form of lower energy bills. Overall, measures focused on shifting to renewable energy offer opportunities for reduced energy costs, job creation, improved housing and transportation options, and enhanced environmental quality, ultimately improving the well-being of these communities. **Table 5-8** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support the shift to renewable energy.

Table 5-8
Shift to Renewable Energy

WRCOG Measures	
WRCOG LE-2	Community Choice Energy/Green Grid Offerings
WRCOG LE-1	Expand Local Renewable Energy Production
CVAG Measures	
CVAG SNE 2.3, Indio CAP Reductions	Alternative Energy Development
CVAG SNE 2.13	Open Space for Renewable energy
CVAG CA 1, SNE 2.14, 4.1	Municipal Facility Upgrades; Renewable Energy at City Facilities
CVAG SNE 2.4	Community Choice Aggregation
CVAG CA 7	Net Zero Buildings
CVAG	Electric Charging and renewable energy master plan
Regional: CVAG	Solar Installation
Regional: CVAG	Solar agriculture water pumps
Regional: CVAG	On-farm renewable energy generation
Regional: CVAG	Solar Installation
Regional: CVAG	Solar agriculture water pumps
Regional: CVAG	On-farm renewable energy generation (Renewable)
SBCOG Measures	
Regional: SBCOG Energy-4	Solar Installations for New Commercial/Industrial Development
Regional: SBCOG Energy-5	On-site Solar Energy for New and Existing Warehouse Space
Regional: SBCOG Energy-6	Solar Installations for Existing Housing
Regional: SBCOG Energy-7	Solar Installations for Existing Commercial Buildings
Regional: SBCOG Wastewater-1	Methane Recovery
Regional: SBCOG Agriculture-1	Methane Capture at Large Dairies

Reduce VMT Through Land Use Changes

The design of the built environment significantly impacts reliance on motorized vehicles, determining the extent to which vehicle travel is necessary or avoidable. Strategic land use changes can support reductions in Vehicle Miles Traveled (VMT) by encouraging a concentration of uses which minimizes car dependency. The implementation of measures aimed at reducing Vehicle Miles Traveled (VMT) through land use changes presents several co-benefits for LIDACs.

Transit-Oriented Development (TOD) and the expansion of public transportation, such as a Metrolink expansion, can improve accessibility to jobs, education, and essential services, reducing the need for car ownership and associated expenses. Citywide zoning code updates and subdivision ordinances that prioritize mixed-use and connected development can be used to foster vibrant neighborhoods with access to various amenities, enhancing the overall quality of life for LIDACs. Improved access to housing is another co-benefit. Policies related to parking requirements, increased housing density, and enhanced land use diversity can lead to more affordable housing options within these communities. This can alleviate housing cost burdens, making it easier for low-income residents to find suitable accommodation.

In summary, measures aimed at reducing VMT through land use changes, when tailored to the needs of LIDACs, offer co-benefits that include increased access to affordable housing, improved transportation options, economic development, reduced urban sprawl, and enhanced environmental quality. **Table 5-9** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to reduce VMT through land use changes.

Table 5-9
Reduce VMT Through Land Use Changes

WRCOG Measures	
WRCOG LT-4	Parking Pricing and Limited Requirements
WRCOG LT-7	Increase Housing Density
WRCOG LT-8	Increase Land Use Diversity
WRCOG LT-9	Transit Oriented Development
Regional WRCOG: RT-1	Metrolink Expansion
CVAG Measures	
CVAG	Citywide Zoning Code Update
CVAG Indio MA 3	Subdivision Ordinance
CVAG Indio LUA 2,4,6,9	Prioritize Mixed-Use, Connected Development
CVAG Coachella LU&T, Indio MG 8, MA 6	Managed Parking
CVAG Indio LUA 11	Create Infill Housing
SBCOG Measures	
SBCOG	Parking Policy and Event Parking
SBCOG 8	Smart Growth and Infill - mix-use development

Clean Vehicles and Reduced Tailpipe Emissions

Policy measures related to Clean Vehicles and Reduced Tailpipe Emissions can result in co-benefits for LIDACs in the form of improved air quality, enhanced mobility, and cost-savings. For example, traffic signal coordination and idling ordinances can reduce congestion, leading to lower emissions and better air quality. This is of particular importance for LIDACs located near high traffic surface streets who are exposed to pollutants from nearby vehicles. Reducing tailpipe emissions through local and regional Zero Emission Vehicle (ZEV) initiatives benefits LIDACs in the form of improved air quality.

These initiatives can be coupled with efforts to make ZEVs more accessible to LIDACs that may not have access to electric vehicle charging at home. Mobility for LIDACs is further enhanced by programs like Electric Bike and Scooter Programs and Golf Cart Routes, which offer affordable and eco-friendly transportation alternatives. Other vehicle transition programs like Neighborhood Electric Vehicles program and Community Fleet Electrification along with Electric-Powered Construction Equipment initiatives not only provide cleaner transportation options but also create local job opportunities in maintenance and operation, fostering economic growth within these communities. **Table 5-10** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support clean vehicles and reduce tailpipe emissions.

Table 5-10
Clean Vehicles and Reduced Tailpipe Emissions

WRCOG Measures	
WRCOG LT-6	Traffic Signal Coordination
WRCOG LT-10	Local ZEV Programs
Regional WRCOG: RT-3	Regional Zero Emission Vehicle (ZEV) Initiatives
CVAG Measures	
CVAG Indio MG 8	Low-Carbon Vehicles
CVAG Indio 2019 CAP Reductions	Support Fuel Efficient and Alternative Fuel Vehicles
CVAG Coachella CAP	Intelligent Transportation Systems (ITS) / Traffic Flow
CVAG	Downtown Electric Charging Parking Lot
CVAG	Electric Bike and Scooter Program
CVAG Indio Mobility Element	Golf Cart Routes and Neighborhood Electric Vehicles
CVAG	Electric Charging and renewable energy master plan
CVAG Indio MA 8	Vehicle Idling
Regional: CVAG	Upgrades and Expansion on traffic signal coordination (CVSync)
Regional: CVAG	Neighborhood Electric Vehicles program
SBCOG Measures	
SBCOG G-2, G-3	Install Community Charging Stations
SBCOG	Vehicle Idling
Regional: SBCOG On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric
Regional: SBCOG	Community Fleet Electrification
Regional: SBCOG	Electric-Powered Construction Equipment
Regional: SBCOG	Idling Ordinance

Mode Shift

Implementing measures that minimize the presence and duration of cars on the road plays a pivotal role in lowering community GHG emissions. These measures can also have co-benefits for LIDACs that result from improved local environmental conditions.

Enhanced bicycle transportation systems offer LIDAC residents accessible and eco-friendly transportation alternatives, reducing the financial burden associated with car ownership. These measures encourage cycling as a mode of transport, providing a cost-effective way for

community members to access jobs, schools, and essential services. Additionally, enhancing pedestrian infrastructure, along with Safe Routes to School initiatives, ensures safer and more convenient mobility options for students and families in these communities, promoting active and healthier lifestyles while reducing the need for car trips. These combined efforts contribute to reduced transportation costs and improved overall well-being for LIDACs.

Carshare and carpool programs, coupled with Transportation Demand Management strategies, provide LIDACs with cost-effective transportation alternatives, reducing their reliance on private vehicles and associated expenses. These measures not only improve access to jobs, education, and essential services but also contribute to improved air quality in LIDACs.

Overall, Mode Shift measures, when implemented with a focus on equity and inclusivity, offer co-benefits that include enhanced access to affordable and sustainable transportation options, improved safety, reduced transportation costs, and healthier living environments for LIDACs. **Table 5-11** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support mode shift.

Table 5-11
Mode Shift

WRCOG Measures	
WRCOG LT-1	Bicycle Infrastructure Improvements
WRCOG LT-2	Pedestrian Infrastructure Improvements
WRCOG LT-3	Carshare & Carpool Programs
REGIONAL WRCOG: RT-2	Transportation Demand Management
CVAG Measures	
CVAG Indio MA 1,2,7	Complete Street and Bicycle Network
CVAG Indio MA 7	Safe Routes to School
CVAG Indio MG 8	Bicycle Parking
CVAG Indio IMG 7	Employee Carpooling Program
CVAG Indio 2019 CAP Reductions	Support Transportation Demand Management
CVAG Indio 2019 CAP Reductions	Improve Pedestrian and Bicycle Infrastructure
CVAG Coachella CAP	Transportation Demand Management (TDM)
Regional: CVAG	CalVans or City Coachella Tesla car sharing program
Regional: CVAG	CVLink Multimodal Access
SBCOG Measures	
Regional: SBCOG Transportation-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting
Regional: SBCOG Transportation-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization
Regional: SBCOG Transportation-4	Expand Bike Routes

Expand and Improve Transit

Fostering an inclusive and equitable urban mobility landscape through targeted measures benefits LIDACs when done in a way that addresses their specific transportation needs. These measures can also contribute to improved environmental and socioeconomic conditions for community members. Increasing transit service frequency and subsidizing transit costs can significantly enhance transportation affordability and mobility resources for LIDAC residents. These measures facilitate easier access to employment, education, and healthcare facilities while also reducing the financial burden of transportation.

The introduction of dockless/micromobility and new mobility programs, coupled with the expansion of public transit options and "Last Mile" connectivity, promises to bridge existing gaps in transit systems. These interventions cater to the unique needs of LIDACs, offering flexible, cost-effective, and efficient transportation alternatives. By promoting mass transit and implementing smart bus technologies, LIDACs benefit from improved travel times and transit reliability, which support a high quality of life and economic opportunities. **Table 5-12** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to expand and improve transit services.

Table 5-12
Expand and Improve Transit

WRCOG Measures	
WRCOG LT-5	Increase Transit Service/Frequency
WRCOG LT-11	Subsidized Transit
WRCOG LT-12	Dockless/ Micromobility/ New Mobility Programs
CVAG Measures	
CVAG Indio MG 3	Service Network, Promote Mass Transit
CVAG Indio MG 3, Coachella LU&T	Commuter Transit
CVAG Indio 2019 CAP Reductions	Expand Public Transit Options and "Last Mile" Connectivity
CVAG	Implement airport shuttle program, encourage/require low-emitting mass transit options for events
SBCOG Measures	
SBCOG On Road-2	SBCOG Smart Bus technologies

Materials Recycling and Waste Reduction

Materials recycling and waste reduction measures offer a range of co-benefits for LIDACs. These measures reduce hazards associated with improper waste disposal, which can lead to improved air and water quality. Recovering and reusing materials, as emphasized in recycling and waste reduction efforts, can stimulate local economic opportunities within LIDACs by creating jobs and supporting recycling industries. Similarly, initiatives like zero waste programs and greener waste management practices can generate local jobs in waste management, food recovery, and composting, providing valuable economic opportunities within LIDACs. In addition to job creation, collaboration with local food banks, through food share strategies, can help improve

food access in these communities, addressing food insecurity issues. Public education and outreach components can be used to empower residents with knowledge about sustainable waste practices, fostering a sense of environmental stewardship and community engagement.

Overall, these measures offer co-benefits that encompass economic opportunities, improved food access, environmental enhancements, and community empowerment, collectively contributing to the well-being and resilience of LIDACs. **Table 5-13** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support materials recycling and reduce waste.

Table 5-13
Materials Recycling and Waste Reduction

WRCOG Measures	
WRCOG LR-1	Zero Waste Initiatives
CVAG Measures	
CVAG IPS 5.13. Indio IA 4	Construction and Demolition Debris
CVAG IPS 5.10	Electronic Waste
CVAG IPS 5.9	Greener Waste Management Practices
CVAG IPS 5.15	On-site Collection and Storage of Recyclables
CVAG IPS 5.16	Public Education
CVAG IPS 5.14	Recyclable Materials - All City Operations
CVAG IPS 5.2	Reduce Use of Toxics
CVAG Indio IA 8	Event Waste Diversion
CVAG IPS 5.3, Indio CAP Red	Solid Waste Diversion and Recycling
CVAG Indio 2019 CAP Reductions	Green Purchasing
CVAG IA 4	Multifamily Recycling and Composting
CVAG IPS 5.4, IA4	Zero Waste
CVAG IA 7	Food Share Program
SBCOG Measures	
SBCOG 20	Construction and Demolition Waste Recovery Ordinance
Regional: SBCOG Waste-1	Waste Diversion

Water Conservation

By decreasing water consumption and promoting efficient water use, these measures can lead to reduced energy demands for water treatment and distribution. Pumping, treating, and transporting water requires a significant amount of energy, primarily derived from fossil fuels, contributing to GHG emissions. Additionally, the promotion of water conservation and efficient practices, as seen in public education campaigns, rebate programs, and ordinances, can result in reduced water heating needs, further reducing energy consumption and GHG emissions. Reduced energy demands in water treatment and distribution translate into potential cost savings that can directly benefit financially vulnerable communities. **Table 5-14** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to conserve water.

Table 5-14 Water Conservation	
WRCOG Measures	
WRCOG LW-1	Increase Recycled Water Use
CVAG Measures	
CVAG SNE 3.1	Conservation Performance Targets New Construction
CVAG SNE 3.3, CA 6	Greywater Ordinance
CVAG SNE 3.7, 13.14, CA 5	Sustainable Landscape Design and Water Conservation
CVAG SNE 3.6	Public Education
CVAG SNE 3.5, Indio Existing Policy	Recycled Water
CVAG Indio Existing Policy	Water Conservation Rate Schedule
CVAG Indio Existing Policy	Water Rebate Program
CVAG Coachella CAP	Water Conservation Ordinance for Existing Homes and Businesses
Regional: CVAG	Low-flow showerheads and faucets
Regional: CVAG	Turf rebate water efficient landscape conversion program
SBCOG Measures	
SBCOG Local WW-1, wastewater-3	Recycled Water
SBCOG Local W-1	Develop Programs to Promote Water Efficiency and Conservation
Regional: SBCOG Water-1	Require Adoption of the Voluntary CALGREEN water efficiency measures for New Construction
Regional: SBCOG Water-2	Require Adoption of the Voluntary CALGREEN water efficiency measures for Existing Buildings
Regional: SBCOG Water-3	Encourage Water-Efficient Landscaping Practices

Expand Community Resilience

Measures that increase community resilience to climate change are particularly vital for LIDACs as they are often most vulnerable to climate-related hazards. Heat island mitigation measures, for example, help make neighborhoods more livable even during the hottest times of the year. These mitigation measures coupled with placemaking efforts help create inclusive, accessible neighborhoods where people enjoy spending time in their own community, reducing the need for long commutes and costs associated with traveling. Weatherization programs that offer financial assistance to communities for home improvements are especially beneficial when oriented to LIDACs. These programs help ensure communities have proper insulation and efficient filtration systems, which reduce energy costs and improve living conditions. Formalized vulnerability assessments also help highlight the unique conditions within a particular community that need attention in the face of changing climate conditions. Resilience centers with programming and resources support communities before, during, and after disasters. Communities with these resources are then better equipped to adapt to and mitigate the impacts of climate change, leading to improved sustainability and quality of life in the face of environmental challenges. **Table 5-15** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to increase community resilience.

Table 5-15 Expand Community Resilience	
CVAG Measures	
CVAG	Heat Island Mitigation Plan
CVAG Indio LUA 7	Placemaking Program
CVAG CA 3	Low Income Weatherization Assistance Program
CVAG	Vulnerability/Resiliency Assessment
CVAG	Coachella Resiliency Center
Regional: CVAG	Air Filtration
SBCOG Measures	
SBCOG 26	Climate Change Awareness and Education

Promote Sustainable Business Practices

Promoting sustainable business practices can yield benefits for low income and disadvantaged communities. The development of sustainable cannabis grow facilities and eco-friendly commercial buildings can lead to a healthier local environment. When designed and managed in resource-conscious ways these businesses can reduce waste and emissions, and even incorporate green spaces into their design, which collectively contribute to better air and water quality in the surrounding areas. Additionally, an emphasis on green jobs opens up new employment opportunities for residents of LIDACs. These jobs, which are often in the forefront of sustainable practices and renewable energy technologies, provide employment and skills training in fast-growing, future-proof industries. This can lead to a more resilient local economy and greater job security for community members. **Table 5-16** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to promote sustainable business practices.

Table 5-16 Promote Sustainable Business Practices	
CVAG Measures	
CVAG	Promote Sustainable Cannabis Grow Facilities and Other Large Commercial Buildings
SBCOG Measures	
SBCOG 28	Green Jobs

Expand Carbon Sequestration

Carbon sequestration measures can greatly improve air quality, as trees and plants act as natural air filters, absorbing pollutants and releasing oxygen. The implementation of shade trees, parks, and rooftop gardens provides natural cooling, reducing the need for air conditioning and thus lowering energy bills. Furthermore, tree give-away programs and initiatives promoting local gardens empower residents of LIDACs to actively participate in environmental stewardship. This involvement can foster a sense of community ownership and responsibility towards local environments, while also providing educational opportunities regarding sustainability and climate action. These measures can also create job opportunities in LIDACs, offering employment in the

planting, maintenance, and care of these green spaces. **Table 5-17** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to expand carbon sequestration.

Table 5-17 Expand Carbon Sequestration	
WRCOG Measures	
WRCOG LE-6	Shade Trees
CVAG Measures	
CVAG SNE 1.11, 4.6	Shade Trees
CVAG SNE 4.6, 1.11	Urban Forest
CVAG SNE 13.2-5,13.9,13.10,13.12, 13.14,13.15	Parks and Open Space
Regional: CVAG	Tree Give-away
SBCOG Measures	
SBCOG 27	Carbon Sequestration
REGIONAL: SBCOG Land Use-1	Promote Rooftop Gardens
REGIONAL: SBCOG Land Use-2	Urban Tree Planting

Local Agriculture

A large share of GHG emissions result from food production, including transportation, refrigeration, deforestation for farming, and other food system processes. In addition to reducing GHG emissions from food production, this measure provides benefits to LIDACs by supporting local farms, community gardens, and sustainable food production.

For LIDACs, access to locally produced, fresh food from community gardens and local farms is particularly valuable. Choosing such options not only lowers GHG emissions associated with food production but also improves community health by addressing health disparities often faced in these communities with limited food access. Local food production and community gardens provide benefits for LIDACs, including the creation of local jobs, enhancing resilience within these communities, and improving overall well-being. Sustainable organic farming and production methods can further promote healthier food options. Additionally, local food production reduces emissions related to transportation, as less fuel is needed to transport food to consumers. Thus, supporting local agriculture and community gardens not only addresses environmental concerns but also provides numerous co-benefits that positively impact the lives and livelihoods of LIDACs. **Table 5-18** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support local agriculture.

Table 5-18 Local Agriculture	
WRCOG Measures	
WRCOG LA-1	Local Agriculture/Community Gardens

CHAPTER 6 – References

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Appendix A

WRCOG Local Climate Action Plans

This appendix includes tables of GHG reduction measures found in seven existing local Climate Action Plans (CAPs) in the Western Riverside Council of Government (WRCOG) region developed by the cities of Beaumont, Corona, Lake Elsinore, Murrieta, Moreno Valley, and Riverside, as well as the County of Riverside. The reduction measures tables are taken directly from each CAP, with the original table numbers referenced in each table header. A column has been added to each table to show alignment with measures in the (Priority Climate Action Plan (PCAP). If a local CAP measure is not accounted for in the WRCOG Subregional CAP, it is categorized as "None Identified." Additionally, local CAP measures identified as "not quantified - supporting action" indicate that the measure is not quantified by the WRCOG Subregional CAP, or it is a general or supporting measure that is not tied to a specific sector.

City of Beaumont CAP (2015): Table A-1a
Summary of Community GHG Reduction Strategies and Emission Reductions (From CAP Table 8)

Goal and Policy	2020 Emission Reductions ($MTCO_2e$)	2030 Emission Reductions ($MTCO_2e$)	PCAP Aligning Measure
Goal 1: Increase Energy Efficiency in Existing Residential Units			
1.1: Energy Efficiency Education and Best Practices	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
1.2: Increase Community Participation in Existing Energy Efficiency Opportunities	40	121	LE-3: Improve Energy Efficiency of Existing Buildings
1.3: Promote or Establish Free or Required Home Energy Evaluations	-		LE-3: Improve Energy Efficiency of Existing Buildings
1.4: Promote Residential Home Energy Renovations	2,123	6,368	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 2: Increase Energy Efficiency in New Residential Development			
2.1: Encourage or Require Energy Efficiency Standards Exceeding State Requirements	8,166	24,497	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 3: Increase Energy Efficiency in Existing Commercial Units			
3.1: Energy Efficiency Training, Education, and Recognition in the Commercial Sector	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
3.2: Increase Business Participation in Existing Energy Efficiency Programs	575	1,725	LE-3: Improve Energy Efficiency of Existing Buildings
3.3: Incentivize or Require Non-Residential Energy Audits	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
3.4: Establish, Promote, Incentivize, or Require Non-Residential Retrofits.	1,232	3,696	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 4: Increase Energy Efficiency in New Commercial Development			
4.1: Encourage or Require Energy Efficiency Standards Exceeding State Requirements	3,521	10,562	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 5: Increase Energy Efficiency through Water Efficiency			
5.1: Support Water Efficiency through Enhanced Implementation of SB X7-7	1,259	3,776	SW-1: Water Conservation Measures
5.2: Exceed Water Efficiency Standards	1	4	SW-1: Water Conservation Measures
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect			
6.1: Tree Planting for Shading and Energy Efficiency	1	4	LE-6: Shade Trees
6.2: Light-reflecting Surfaces for Energy Efficiency	-	-	LE-7: Cool Roofs and Pavements

City of Beaumont CAP (2015): Table A-1a
Summary of Community GHG Reduction Strategies and Emission Reductions (From CAP Table 8)

Goal and Policy	2020 Emission Reductions ($MTCO_2e$)	2030 Emission Reductions ($MTCO_2e$)	PCAP Aligning Measure
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled			
7.1: Encourage Non-Motorized Transportation Options	30	89	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements
7.2: Encourage, Promote, Incentivize, or Expand the Use of Pass Transit System or other Transit Services	95	866	LT-5: Increase Transit Service and Frequency
7.3: Create Bicycle Master Plan to Expand Bike Routes Around the City	13	866	LT-1: Bicycle Infrastructure Improvements
7.4: Promote Ride Sharing Programs within Businesses	147	441	LT-3: Carshare & Carpool Programs
7.5: Electrify the Fleet	501	1,504	LT-10: Local ZEV Programs
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation			
8.1: Reduce Waste to Landfills	7,499	22,496	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use			
9.1: Promote Clean Energy	-	-	
Goal 10: Decrease GHG Emissions of New Development through Application of CEQA Screening Tables			
10.1: Energy Efficiency and Renewable Energy in New Development	2,825	4,742	SE-2: Title 24 Building Energy Standards
10.2: Encourage Solid Waste Reduction in New Development	156	266	LR-1: Zero Waste Initiatives
10.3: Encourage VMT Reduction in New Development	116,839	171,674	LT-10: Transit Oriented Development

City of Beaumont CAP (2015): Table A-1b
Summary of Municipal GHG Reduction Strategies and Emission Reductions (From CAP Table 9)

Goal and Policy	2020 Emission Reductions ($MTCO_2e$)	2030 Emission Reductions ($MTCO_2e$)	PCAP Aligning Measure
Goal M-1: Participate in Education, Outreach, and Planning Efforts for Energy Efficiency			
M-1.1: Increase Energy Savings through the SCE Energy Leader Partnership	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
Goal M-2: Increase Energy Efficiency in Municipal Buildings			
M-2.1: Conduct Municipal Energy Audit	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
M-2.2: Green Building Participation	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
M-2.3: Demand Response Programs	-	-	LE-2: Community Choice/Utility Renewable Electricity
M-2.4: Direct Install Program	22.88	34.12	LE-3: Improve Energy Efficiency of Existing Buildings
M-2.5: Procurement Policy for Energy Efficient Equipment	21.96	75.58	LE-2: Community Choice/Utility Renewable Electricity
M- 2.8: Recycled Solid Waste	-	-	SR-1: Recycling and Waste Diversion Mandates
M-2.9: Recycled Water	-	-	LW-1: Increase Recycled Water Use
Goal M-3: Increase Energy Efficiency in Community Buildings and Infrastructure			
M-3.1: Traffic Signal and Outdoor Lighting Retrofits	-	-	LE-5: Traffic & Street Light Upgrades
M-3.2: Upgrade or Incorporate Water-Conserving Landscape	-	-	SW-1: Water Conservation Measures
M-3.3: Plant Trees for Shade and Carbon Sequestration	-	-	LE-6: Shade Trees
Goal M-4: On-Road Energy Efficiency Enhancements; Employee Commute and Vehicle Fleet			
M-4.1: Introduce Pass Transit Benefits	-	-	LT-11: Subsidized Transit
M-4.2: Encourage or Incentivize Employee Carpools	3.4	6.5	LT-3: Carshare & Carpool Programs
M-4.3: Encourage or Incentivize Purchase of Hybrid or Electric Vehicles	6.42	8.28	LT-10: Local ZEV Programs
M-4.4: Replace or Supplement Vehicle Fleet with Hybrid/Electric Vehicles	22.4	76.5	LT-10: Local ZEV Programs
M-4.5: Install E-Vehicle Chargers	3.5	5.6	LT-10: Local ZEV Programs
Goal M-5: Reduce Energy Consumption in the Long Term			
M-5.1: Ongoing Actions and Projected Reductions	276	2,808	-

City of Corona CAP Update (2019): Table A-2
Summary of Community GHG Reduction Strategies and Emission Reductions (based on CAP Table 9)

Goals and Measures	2030 Emission Reductions ($MTCO_2e$)	2040 Emission Reductions ($MTCO_2e$)	PCAP Aligning Measure
Goal 1: Increase Energy Efficiency in Existing Residential Units			
1.1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
1.2: Increase Community Participation in Existing Energy Efficiency Programs	3,715	3,885	LE-3: Improve Energy Efficiency of Existing Buildings
1.3: Home Energy Evaluations	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
1.4: Residential Home Energy Renovations	2,276	2,380	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 2: Increase Energy Efficiency in New Residential Units			
2.1: Exceed Energy Efficiency Standards	3,918	4,097	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 3: Increase Energy Efficiency in Existing Commercial Units			
3.1: Energy Efficiency Training, Education, and Recognition in the Commercial Sector	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
3.2: Increase Business Participation in Existing Energy Efficiency Programs	7,031	7,557	LE-3: Improve Energy Efficiency of Existing Buildings
3.3: Nonresidential Building Energy Audits	-	-	LE-3: Improve Energy Efficiency of Existing Buildings
3.4: Nonresidential Building Retrofits	37,592	40,406	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 4: Increase Energy Efficiency in New Commercial Units			
4.1: Exceed Energy Efficiency Standards	5,742	6,172	LE-3: Improve Energy Efficiency of Existing Buildings
Goal 5: Increase Energy Efficiency through Water Efficiency			
5.1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	1,524	1,607	LW-1: Increase Recycled Water Use SW-1: Water Conservation Measures
5.2: Exceed Water Efficiency Standards	-	-	SW-1: Water Conservation Measures
Goal 6: Decrease Energy Demand through Reducing Urban Heat Island Effect per Title 24 Requirements			
6.1: Tree Planting for Shading and Energy Saving	-	-	LE-6: Shade Trees
6.2: Light-Reflecting Surfaces for Energy Saving	601	633	LE-7: Cool Roofs and Pavements

City of Corona CAP Update (2019): Table A-2
Summary of Community GHG Reduction Strategies and Emission Reductions (based on CAP Table 9)

Goals and Measures	2030 Emission Reductions ($MTCO_2e$)	2040 Emission Reductions ($MTCO_2e$)	PCAP Aligning Measure
Goal 7: Decrease Greenhouse Gas Emissions through Reducing Vehicle Miles Traveled			
7.1: Alternative Transportation Options	53,944	57,849	LT-2: Pedestrian Infrastructure Improvements LT-4: Parking Pricing and Limited Requirements
7.2: Implement Bicycle Master Plan to Expand Bicycle Routes around Corona	482	517	LT-1: Bicycle Infrastructure Improvements
Goal 8: Decrease Greenhouse Gas Emissions through Reducing Solid Waste Generation			
8.1: Reduce Waste to Landfills	20,271	21,378	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Goal 9: Decrease Greenhouse Gas Emissions through Increasing Clean Energy Use			
9.1: Clean Energy	21,999	21,999	LE-3: Improve Energy Efficiency of Existing Buildings
9.2: Join CCA Program	214,052	230,348	LE-2: Community Choice/Utility Renewable Electricity

City of Lake Elsinore (2011): Table A-3
Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)

Measure Number and Title	2020 GHG Reduction Potential ($MTCO_2e$)	2030 GHG Reduction Potential ($MTCO_2e$)	PCAP Aligning Measure
State-Level Measures			
AB 1493 (Pavley)	118,167	225,199	-
Low Carbon Fuel Standards	46,841	89,268	-
Heavy/Medium Duty Efficiency	1,065	2,029	-
Passenger Vehicle Efficiency	17,033	32,461	-
Renewable Portfolio Standard	56,422	107,527	-
Total Reductions from State Measures	**239,528**	**456,484**	
Local Strategies and Measures			
Transportation and Land Use Measures			
Strategy T-1: Increase Bicycle, Pedestrian and Public Transit Travel			
Measure T-1.1: Safe Routes to School	288	576	LT-2: Pedestrian Infrastructure Improvements
Measure T-1.2: Pedestrian Infrastructure	557	1,115	LT-2: Pedestrian Infrastructure Improvements
Measure T-1.3: Street and Sidewalk Maintenance and Improvements	Contributes to T-1.2 and T-1.4	Contributes to T-1.2 and T-1.4	LT-2: Pedestrian Infrastructure Improvements
Measure T-1.4: Bicycle Infrastructure	2,230	4,460	LT-1: Bicycle Infrastructure Improvements
Measure T-1.5: Bicycle Parking Standards	Contributes to T-1.4	Contributes to T-1.4	LT-1: Bicycle Infrastructure Improvements
Measure T-1.6: Public Transit Incentives	2,527	5,055	LT-5: Increase Transit Service and Frequency LT-11: Subsidized Transit
Strategy T-2: Manage Vehicle Parking			
Measure T-2.1: Designated Parking for Fuel-Efficient Vehicles	872	1,744	LT-10: Local ZEV Programs
Strategy T-3: Increase Efficiency of Land Use Patterns			
Measure T-3.1: Mixed-Use, High Density, Infill, and Transit-Oriented Development	27,107	54,215	LT-9: Transit-Oriented Development

City of Lake Elsinore (2011): Table A-3
Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)

Measure Number and Title	2020 GHG Reduction Potential ($MTCO_2e$)	2030 GHG Reduction Potential ($MTCO_2e$)	PCAP Aligning Measure
Measure T-3.2: Mixed-Use, Infill, and Transit-Oriented Development Incentives	Included in T-3.1	Included in T-3.1	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
Measure T-3.3: Density Bonus Incentive	Included in T-3.1	Included in T-3.1	LT-7: Increase Housing Density LT-9: Transit-Oriented Development
Measure T-3.4: Neighborhood Commercial Centers	Included in T-3.1	Included in T-3.1	LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
Strategy T-4: Reduce Trips			
Measure T-4.1: Commute Trip Reduction Program	1,608	3,216	RT-2: Telecommuting LT-3: Car Share and Carpool Programs LT-11: Subsidized Transit
Strategy T-5: Increase the Use of Low- and Zero-Emissions Vehicles			
Measure T-5.1: Hybrid and Fuel-Efficient Vehicle Incentives	26,924	53,848	RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives LT-10: Local ZEV Programs
Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy	25	50	LT-10: Local ZEV Programs: Infrastructure and Vehicle Purchases
Subtotal Transportation and Land Use	**62,138**	**124,279**	
Energy Measures			
Strategy E-1: Reduce Energy Demand of New Construction			
Measure E-1.1: Tree Planting Requirements	378	757	LE-6: Shade Trees
Measure E-1.2: Cool Roof Requirements	5,934	11,868	LE-7: Cool Roofs and Pavements
Measure E-1.3: Energy Efficient Building Standards	41,302	82,604	SE-2: California Building Energy Efficiency Standards
Strategy E-2: Increase Energy Efficiency of Existing Buildings			
Measure E-2.1: Energy Efficiency Upgrades and Retrofits	26,528	53,057	LE-3: Improve Energy Efficiency of Existing Buildings
Measure E-2.2: Green Business Certification Program	Included in E-2.1 (2,998)	Included in E-2.1 (5,997)	LE-3: Improve Energy Efficiency of Existing Buildings

City of Lake Elsinore (2011): Table A-3
Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)

Measure Number and Title	2020 GHG Reduction Potential ($MTCO_2e$)	2030 GHG Reduction Potential ($MTCO_2e$)	PCAP Aligning Measure
Measure E-2.3: Compact Fluorescent Light Bulb (CFL) Distribution Program	Included in E-2.1 (60)	Included in E-2.1 (60)	LE-3: Improve Energy Efficiency of Existing Buildings
Strategy E-3: Increase in Energy Efficiency of Municipal Buildings and Facilities by 15% by 2020 and 20% by 2030			
Measure E-3.1: City HVACs	3	3	LE-3: Improve Energy Efficiency of Existing Buildings
Measure E-3.2: Energy Efficient Street and Traffic Signal Lights	274	548	LE-5: Traffic & Street Light Upgrades
Measure E-3.3: Street Light Automatic Daylighting Control Devices	100	100	LE-5: Traffic & Street Light Upgrades
Measure: E-3.4: Energy Efficient Lights, Ballasts, and Occupancy Sensors at City Facilities	33	33	LE-3: Improve Energy Efficiency of Existing Buildings
Measure E-3.5: Municipal Energy Efficiency Upgrades and Purchasing Standards	471	629	LE-3: Improve Energy Efficiency of Existing Buildings
Strategy E-4: Reduce Water Consumption			
Measure E-4.1: Landscaping Ordinance	3,602	7,205	LW-1: Increase Recycled Water Use
Measure E-4.2: Indoor Water Conservation Requirements	6,940	13,881	SW-1: Water Conservation Measures
Strategy E-5: Increase the use of renewable energy			
Measure E-5.1: Renewable Energy Incentives	3,566	7,132	LE-1: Expand Local Renewable Energy Production
Subtotal Energy	**89,131**	**177,817**	
Solid Waste Measures			
Strategy S-1: Increase Solid Waste Diversion			
Measure S-1.1: Commercial Recycling	6,366	7,074	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Measure S-1.2: Tiered Solid Waste Rate Structure	1,696	1,884	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Measure S-1.3: Recycling Receptacles at City Buildings and Facilities	<1	1	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates

City of Lake Elsinore (2011): Table A-3
Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)

Measure Number and Title	2020 GHG Reduction Potential ($MTCO_2e$)	2030 GHG Reduction Potential ($MTCO_2e$)	PCAP Aligning Measure
Measure S-1.4: Construction and Demolition Waste Diversion	152	152	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Measure S-1.5: Green Waste Program	212	414	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Strategy S-2: Decrease Waste Generated			
Measure S-2.1: Municipal Purchasing Policy	<1	<1	LR-1: Zero Waste Initiatives
Subtotal Solid Waste	**8,427**	**9,525**	
Public Education and Outreach Measures			
Strategy EO-1: Expand Community Education and Outreach			
Measure EO-1.1: Green Page on City's Webpage	Contribute to transportation, energy, and solid waste measures.		Not quantified- Supporting actions
Measure EO-1.2: Quarterly Brochures with Emissions Reduction Information	Contribute to transportation, energy, and solid waste measures.		Not quantified- Supporting actions
Measure EO-1.3: Themed Events	Contribute to transportation, energy, and solid waste measures.		Not quantified- Supporting actions
Measure EO-1.4: Multi-Modal Transportation Access Guide	Contribute to transportation measures.		Not quantified- Supporting actions
Subtotal Public Education and Outreach	**Not applicable**		
Total Reduction from Local Measures	**159,696**	**311,621**	
Total Reduction from State and Local Measures	**399,224**	**768,105**	

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
Transportation Cap Strategies					
TR-1	Partner with Moreno Valley Unified School District (MVUSD), Val Verde Unified School District (VVUSD), and Moreno Valley College to establish an online system like 511.org that links employees and guardians of students to provide carpool matching.	7.2 – 15.8% (CAPCOA)	7.2%	36,671 $MTCO_2e$	LT-3: Carshare & Carpool Program
TR-2	Continue to implement a Safer Routes to School program for increased bicycle and pedestrian safety to and from schools.	7.2 – 15.8% (CAPCOA)	7.2%	36,671 $MTCO_2e$	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements
TR-3	Establish a goal of achieving a 10 percent increase in alternative mode use by people employed in Moreno Valley, working with businesses with over 50 employees to implement on a voluntary basis Transportation Demand Management strategies and programs identified in Connect SoCal, the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), including but not limited to: implementing commuter benefit programs, promoting telecommuting and alternative work schedule options, and other financial incentives.	5.0 – 30.0% (Victoria Transport Policy Institute)	10.0%	50,932 $MTCO_2e$	RT2: Transportation Demand Management
TR-4	Create a Transportation Demand Management program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	5.0 – 10.0% (Victoria Transport Policy Institute)	5.0%	25,466 $MTCO_2e$	RT2: Transportation Demand Management
TR-5	Implement trip reduction programs in new residential, commercial, and mixed-use developments.	5.0 – 10.0% (Victoria Transport Policy Institute)	5.0%	25,466 $MTCO_2e$	T2: Transportation Demand Management
TR-6	Advocate for transit service improvements by area transit providers with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	0.3 – 20.0% (CAPCOA)	1.0%	5,093 $MTCO_2e$	LT-5: Increase Transit Service & Frequency
TR-7	Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	0.5 – 12.7% (CAPCOA)	12.7%	64,683 $MTCO_2e$	LT-10: Local ZEV Programs
TR-8	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	0.4 – 20.3% (CAPCOA)	1.0%	5,093 $MTCO_2e$	LT-10: Local ZEV Programs

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
TR-9	Consider requiring new multi-family residential and mixed use development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LT-8: Increase Land Use Diversity
TR-10	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements
Total Emissions Reduction				**250,075 $MTCO_2e$**	
Industrial Cap Strategies					
I-1	Actively promote the use of energy-efficient building operations systems in existing and new industrial facilities with the goal of achieving a 40 percent energy reduction in 30 percent of industrial square footage citywide by 2040. Effectiveness should be confirmed through commissioning of new systems.	12.0 − 16.0% (0.4 x 0.3 = 0.12; Mills, E.)	12.0%	38,416 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings SE-2: California Building Energy Efficiency Standards
I-2	Promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Moreno Valley Utility (MVU), Southern California Edison (SCE)) and other private sector funding sources, with the goal of providing 25 percent of energy needs with solar in 30 percent of industrial and warehouse square footage by 2040. Examples of incentives include reduced permit fees or streamlined permit approval processes.	7.0% (0.25 x 0.3 = 0.75; CAPCOA)	7.0%	22,409 $MTCO_2e$	LE-1: Expand Local Renewable Energy Production
I-3	Work with electricity providers (e.g. MVU, SCE) to encourage large commercial and industrial facilities to participate in energy efficient upgrade programs including installation of solar PV systems and EV chargers and to establish annual targets.	0.2 – 5.5% (CAPCOA)	0.5%	1,601 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Industrial Cap Strategies					
I-4	Develop and implement Technology Advancement Program, working with industrial, warehousing, and distribution facilities to encourage innovation, development of new emissions reduction technologies, and energy efficient/alternative fueled equipment upgrades. Provide incentives through partnerships with regional, statewide, and federal programs.	0.4 – 20.3% (CAPCOA)	1.0%	3,201 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Total Emissions Reduction				**65,628 $MTCO_2e$**	

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
Residential Cap Strategies					
R-1	Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.	25.0% (NRDC)	25.0%	13,549 $MTCO_2e$	LE-7: Cool Roofs and Pavements
R-2	Require new construction and major remodels to install interior real-time energy smart meters in line with current utility provider (e.g. MVU, SCE) efforts.	7.0% (ACEEE)	7.0%	5,280 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
R-3	Develop and implement program to incentivize single-family residential efficiency retrofits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide by 2040.	0 – 15.0% 0.5 x 0.3 = 0.15; CAPCOA)	15.0%	3,185 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
R-4	Prioritize cap and trade funds to assist low-income homeowners achieve energy-efficient improvements and fund weatherization programs.	3.7 – 7.5% (CAPCOA)	3.7%	9,793 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
R-5	Apply for and prioritize Community Block Development Grant funds to assist low-income homeowners achieve energy-efficient improvements.	3.7 – 7.5% (CAPCOA)	3.7%	9,793 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
R-6	Develop program and funding strategy to incentivize conversion of natural gas heated homes and nonresidential buildings to electricity.	2.0 – 4.0% (CAPCOA)	2.0%	4,185 $MTCO_2e$	LE-4: Building & Appliance Electrification
R-7	Develop and implement program to incentivize multi-family residential efficiency audits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction in 30 percent of the projected amount of multi-family homes citywide by 2035	0 – 15.0% 0.5 x 0.3 = 0.15; CAPCOA)	15.0%	12,955 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Residential Cap Strategies					
R-8	Provide a toolkit of resources, including web-based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
R-9	Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Total Emissions Reduction				**58,742 $MTCO_2e$**	
Commercial Cap Strategies					
C-1	Expand efforts to install energy-efficient lighting technologies in new and existing private parking lots.	0 – 68% (CAPCOA)	20.0%	21,999 $MTCO_2e$	LE-5: Traffic & Street Light Upgrades
C-2	Facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships such as expansion of utility provider (e.g. MVU, SCE, SoCal Gas) programs to reduce energy use.	5.2 – 15.0% (CAPCOA)	5.2%	8,307 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
C-3	Promote energy efficiency financing programs to medium to large sized commercial facilities.	0.4% (EPA)	0.4%	479 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
C-4	Promote Moreno Valley Utility and Southern California Edison direct install energy efficiency programs to help small businesses identify opportunities to save electricity.	0.4% (EPA)	0.4%	158 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
C-5	Actively engage with Moreno Valley businesses to identify areas for GHG reduction and financial savings.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Total Emissions Reduction				**30,945 $MTCO_2e$**	

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
Off-Road Cap Strategies					
OR-1	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting. Partner with the SCAQMD to establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers. Require new buildings to provide electrical outlets in an accessible location to facilitate use of electric-powered lawn and garden equipment. In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	0 – 49.5% (CAPCOA)	1.0%	4,928 $MTCO_2e$	N/A
OR-2	Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles. Require provision of clear signage reminding construction workers to limit idling. Require project applicants to limit GHG emissions through one or more of the following measures: substitute electrified or hybrid equipment for diesel/gas powered, use alternative-fueled equipment on site, avoid use of on-site generators.	2.5 – 22.0% (CAPCOA)	2.5%	1,232 $MTCO_2e$	N/A
Total Emissions Reduction				**6,160 $MTCO_2e$**	
Public Cap Strategies					
PS-1	Participate in Savings by Design program to identify ways to improve the energy efficiency for all new municipal buildings and facilities. As part of the Savings by Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10%.	0.2 – 5.5% (CAPCOA)	5.5%	66 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
PS-2	Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy efficient equipment.	5.0 – 10.0% (EPA)	10.0%	121 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings

City of Moreno Valley Draft CAP (2021): Table A-4
CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	2040 Estimated GHG Emissions Reduction ($MTCO_2e$ per year)	PCAP Aligning Measure
PS-3	Support Moreno Valley Utility and Southern California's efforts to conduct an annual municipal energy audit to determine if energy efficient retrofits are effective in reducing emissions from City operations.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
PS-4	Utilize Energy Management tools to monitor long-term impacts of municipal efficiency projects.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-3: Improve Energy Efficiency of Existing Buildings
Total Emissions Reduction				**187 $MTCO_2e$**	
Natural Resources Cap Strategies					
NC-1	Require new landscaping to be climate appropriate.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LW-1: Increase Recycled Water Use SW-1: Water Conservation Measures
NC-2	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	General: Covered by multiple measures; Except for Native Landscaping
NC-3	Increase and maintain urban greening in the community by maintaining Tree City USA status and promoting tree planting and urban gardening programs.	Supportive (CAPCOA)	0%	0 $MTCO_2e$	LE-6: Shade Trees
Total Emissions Reduction				**0 $MTCO_2e$**	

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e/yr$)			PCAP Aligning Measure
				2030	2035	2050	
BE-1	Building Energy	Community Renewable Energy	The City shall create or join a Community Choice Aggregation (CCA) program or create a partnership with SoCal Edison's off-site renewable energy programs (i.e., Green Rate Program), which allows building renters and owners to opt into cleaner electricity sources.	28,306	22,210	0	LE-2: Community Choice/Utility Renewable Electricity
BE-2	Building Energy	Municipal Renewable Energy	Develop renewable energy generation systems on City-owned property for use in municipal operations.	26	39	0	LE-1: Expand Local Renewable Energy Production
BE-3	Building Energy	Zero Net Energy Standard	Phase in Zero Net Energy Standard for residential developments by 2030 and nonresidential development by 2035 • Develop and adopt a Zero Net Energy Standard for residential and nonresidential development by 2025 • Begin phase-in of standard beginning in 2025 with standard applying to residential land uses and large nonresidential projects • Fully phase in Zero Net Energy Standard by 2030, requiring all new residential and commercial projects to comply with Zero Net Energy Standard • Fully phase in Zero Net Energy Standard by 2035, requiring all new industrial projects to comply with Zero Net Energy Standard	24,659	50,094	113,303	LE-8: Reach Codes for New Buildings- Going Beyond Title 24
BE-4	Building Energy	Energy Efficiency and Electrification Program	Work with WRCOG's Western Riverside Energy Partnership to develop and implement a comprehensive electrification and energy efficiency retrofit program focused on the reduction of natural gas use in existing residential and commercial land uses. The program would include the goal of reducing natural gas in existing residential and nonresidential land uses 20% by 2030.	33,664	50,800	79,757	LE-4: Building & Appliance Electrification

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e/yr$)			PCAP Aligning Measure
				2030	2035	2050	
			• The program would include but not be limited to strategies focused on reductions from: o Pool-related energy use (e.g., pool cover rebate program) o Electrification retrofits for natural gas appliances in existing residential and commercial land uses (i.e., hot water heaters, cooktops, heating systems)				
LU-1	Land Use	Jobs-Housing Balance Strategy	Encourage flexibility in land use regulations to respond to requirements of new and emerging business and industry types to help create sustainable jobs-housing balance.	10,373	10,418	12,261	N/A
LU-2	Land Use	Tree Planting Program	Develop a tree planting program to plant trees throughout the City to increase carbon sequestration.	6,301	12,956	19,612	LE-6: Shade Trees
LU-3	Land Use	Open Space Conservation	Work with the Western Riverside Regional Conservation Authority (RCA) and the Center for Natural Lands Management to implement land use conservation programs for the City. The program would include a minimum acreage of land preserved through conservation easements and, therefore, would not be permitted for future development.	16,095	18,240	20,385	N/A
T-1	Transportation	EV Programs	Increase electric vehicles and alternative fuel vehicles to 21% of the City's vehicle mix by 2030 and 23% by 2035 by incentivizing EV purchases and promoting EV ownership for residents and businesses.	82,205	87,335	120,574	LT-10: Local ZEV Programs

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e/yr$)			PCAP Aligning Measure
				2030	2035	2050	
T-2	Transportation	EV Programs	Adopt an electric vehicle (EV) charging station ordinance that requires the following for new development: • Installation of one EV charger per single-family housing unit; and 6% of total parking spaces require EV charger infrastructure installation for new multi-family projects • 3% of total parking spaces require EV charger installation for new nonresidential projects	See T-1	See T-1	See T-1	LT-10: Local ZEV Programs
T-3	Transportation	TOD Affordable Housing Program	Prioritize mixed-use and transit-oriented affordable housing projects to achieve the City's affordable housing targets in the SCAG Regional Housing Needs Assessment.	5,036	5,572	7,670	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
T-4	Transportation	Murrieta Bike Network	Increase the City's bike and pedestrian infrastructure, including implementing the Downtown Murrieta Bike Network, developing comprehensive bike parking standards, and increasing the total percentage of City streets that include bike lanes throughout the City.	367	20	0	LT-1: Bicycle Infrastructure Improvements
T-5	Transportation	Traffic Signalization	Improve traffic flow and reduce traffic congestion by implementing a comprehensive traffic signalization synchronization and update.	1,213	1,265	1,500	LT-6: Traffic Signal Coordination
T-6	Transportation	Traffic Calming Program	Implement a traffic calming measure program to increase the percentage of City streets and intersections with calming traffic measures.	890	929	3,306	LT-6: Traffic Signal Coordination

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e/yr$)			PCAP Aligning Measure
				2030	2035	2050	
T-7	Transportation	Transportation Demand Management Program	Implement a Citywide TDM Program to reduce communitywide VMT 1. Update Development Code to require employers with 50 or more employees to implement commute trip reduction programs. Commute trip reduction programs voluntary for employees include: o Alternative modes of commuting incentive program (e.g., walking, biking, etc.); o Ride-sharing and preferential parking; o Discounted transit fee program; or o Telecommuting or alternative work schedules 2. Implement a comprehensive ridesharing program targeted at residents working in neighboring cities and long-distance commuters (i.e., San Diego, Los Angeles). 3. Monitor progress annually on TDM program to measure progress towards achieving a nine percent reduction in VMT by 2030 and an 11 percent reduction by 2035.	8,954	11,416	18,373	RT-2: Telecommuting LT-3: Car Share and Carpool Programs
T-8	Transportation	Transit Network	Work with RTA and WRCOG to expand the transit network in the City and increase service frequency with a priority on expanding services to neighboring cities where Murrieta residents work.	8,659	21,555	25,145	LT-5: Increase Transit Service/Frequency

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e/yr$)			PCAP Aligning Measure
				2030	2035	2050	
T-9	Transportation	GHG Fee Program	Develop and implement a no-net-increase in GHG emissions threshold for new development projects in the City and develop a GHG Fee Program to offset remaining GHG emissions from new development that cannot be achieved through project design features or other CAP measures. As part of implementation of this measure, the City shall: • Adopt a set of strategies to reduce GHG emissions from new development through project- specific mitigation measures (See Implementation Descriptions below for suggestion of potential strategies.) • Develop a process in which the remainder of emissions that cannot be reduced through project-specific measures shall be quantified and offset through a combination of a local emissions offset program to be set up by the City and other offset registry programs (See Implementation Descriptions below for a description of the local emissions offset program.)	41,357	76,481	108,756	N/A
SW-1	Solid Waste	Waste Reduction Program	Encourage recycling or the re-use of materials to reduce the amount of solid waste generated within the City with the goal of achieving a 90% waste diversion rate by 2035.	4,583	7,215	11,120	LR-1: Zero Waste Initiatives
SW-2	Solid Waste	Construction Waste Diversion	Require all construction projects to exceed CalGreen construction waste diversion requirements by 15 percent.	998	827	686	LR-1: Zero Waste Initiatives
WW-1	Water	Landscaping and Water Conservation Program	Reduce outdoor water use by 10% at residential, commercial, and public properties by installing efficient irrigation systems and plants with lower watering needs.	55	44	0	SW-1: Water Conservation Measures

City of Murrieta CAP Update (2020): Table A-5
Summary of GHG Reduction Measure Performance (From CAP Appendix B, Table 2)

Measure #	Sector	Measure Title	Description	GHG Reductions ($MTCO_2e$/yr)			PCAP Aligning Measure
				2030	2035	2050	
WW-2	Water	Rainwater Catchment Program	Encourage property owners to recycle water with rainwater catchment and greywater systems in existing and new developments.	5	4	0	LW-1: Increase Recycled Water Use

NOTES:
$MTCO_2E$ = METRIC TONS OF CARBON DIOXIDE EQUIVALENT.
Source: Ascent Environmental 2019.

City of Riverside CAP (2016): Table A-6a
2020 and 2035 Reductions from State and Regional Measures (From CAP Table B.3-1)

State and Regional Measures by Sector		2020 Reductions ($MTCO_2e/yr$)	2035 Reductions ($MTCO_2e/yr$)	PCAP Aligning Measure
SR-1	Renewables Portfolio Standard	363,096	372,020	SE-1: Renewables Portfolio Standard (RPS)
SR-2	2013 California Building Energy Efficiency Standards (Title 24, Part 6)	19,156	62,927	SE-2: Title 24 Building Energy Standard
SR-3	HERO Residential Program	38,681	64,964	N/A
SR-4	HERO Commercial Program	6,618	86,276	N/A
SR-5	Edison Energy Action Plans	N/A	N/A	N/A
Energy Subtotal		**427,551**	**586,187**	
SR-6	Pavley & Low Carbon Fuel Standard	429,447	694,841	ST-1: Pavley, Advanced Clean Cars, & LCFS
SR-7	Metrolink Expansions	9,045	11,289	RT-1: MetroLink Expansion
SR-8	Express Lanes	23,858	29,779	LT-12: Congestion Pricing/Express Lanes
SR-9	Congestion Pricing	1,272	1,588	LT-12: Congestion Pricing/Express Lanes
SR-10	Telecommuting	15,905	19,853	RT-2: Transportation Demand Management
SR-11	Goods Movement	8,893	10,811	RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives
SR-12	Electric Vehicle Plan and Infrastructure	31,811	39,705	RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives
Transportation Subtotal		**520,232**	**807,866**	
SR-13	Construction and Demolition Waste Diversion	1,789	4,865	SR-1: Recycling and Waste Diversion Mandates
Solid Waste Subtotal		**1,789**	**4,865**	
Total Reductions from State and Regional Measures		**949,572**	**1,398,918**	

City of Riverside CAP (2016): Table A-6b
2020 and 2035 Reductions from Local Measures (From CAP Table B.3-2)

Local Measures by Sector		2020 Reductions ($MTCO_2e/yr$)	2035 Reductions ($MTCO_2e/yr$)	PCAP Aligning Measure
E-1	Traffic and Street Lights	549	4,153	LE-5: Traffic & Street Light Upgrades
E-2	Shade Trees	96	841	LE-6: Shade Trees
E-3	Local Utility Programs – Electricity	32,197	43,491	LE-3: Improve Energy Efficiency of Existing Buildings
E-4	Renewable Energy Production on Public Property	Supporting	Supporting	LE-1: Expand Local Renewable Energy Production
E-5	UC Riverside Carbon Neutral Program	32,959	32,959	NA
E-6	Riverside Public Utilities Technology Grants	Supporting	Supporting	NA
Energy Subtotal		**65,801**	**81,444**	
T-1	Bicycle Infrastructure Improvements	15,905	20,889	LT-1: Bicycle Infrastructure Improvements
T-2	Bicycle Parking	2,168	2,889	LT-1: Bicycle Infrastructure Improvements
T-3	End of Trip Facilities	1,119	1,491	LT-1: Bicycle Infrastructure Improvements
T-4	Promotional Transportation Demand Management	909	1,212	RT-2: Telecommuting LT-3: Car Share and Carpool Programs
T-5	Traffic Signal Coordination	51,693	68,754	LT-6: Traffic Signal Coordination
T-6	Density	1,259	1,887	LT-7: Increase Housing Density
T-7	Mixed-Use Development	769	1,153	LT-8: Increase Land Use Diversity
T-8	Pedestrian Only Areas	1,399	1,824	LT-2: Pedestrian Infrastructure Improvements
T-9	Limited Parking Requirements for New Development	17,482	24,757	LT-4: Parking Pricing and Limited Requirements
T-10	Bus Rapid Transit Services	1,399	2,330	LT-5: Increase Transit Service and Frequency
T-11	Voluntary Transportation Demand Management	2,185	3,095	RT-2: Telecommuting LT-3: Car Share and Carpool Programs
T-12	Accelerated Bike Plan Implementation	3,496	4,951	LT-1: Bicycle Infrastructure Improvements
T-13	Fixed Guideway Transit	-	13,981	LT-5: Increase Transit Service and Frequency
T-14	Neighborhood Electric Vehicle Programs	3,496	4,660	LT-10: Local ZEV Programs
T-15	Subsidized Transit	3,496	4,951	LT-11: Subsidized Transit

City of Riverside CAP (2016): Table A-6b
2020 and 2035 Reductions from Local Measures (From CAP Table B.3-2)

Local Measures by Sector		2020 Reductions ($MTCO_2e/yr$)	2035 Reductions ($MTCO_2e/yr$)	PCAP Aligning Measure
T-16	Bike Share Program	210	280	LT-1: Bicycle Infrastructure Improvements
T-17	Car Share Program	2,797	3,728	LT-3: Carshare & Carpool Programs
T-18	SB 743 as Alternative to LOS	2,028	2,703	LT-9: Transit-Oriented Development
T-19	Alternative Fuel and Vehicle Technology and Infrastructure	5,245	6,991	LT-10: Local ZEV Programs
T-20	Eco-Corridor	Supporting	Supporting	NA
Transportation Subtotal		**111,811**	**172,526**	
W-1	Water Conservation and Efficiency	10,748	10,748	SW-1: Water Conservation Measures
Water Subtotal		**10,748**	**10,748**	
SW-1	Yard Waste Collection	468	1,238	SR-1: Recycling and Waste Diversion Mandates
SW-2	Food Scrap and Paper Diversion	571	9,317	SR-1: Recycling and Waste Diversion Mandates
Solid Waste Subtotal		**1,039**	**10,555**	
A-1	Local Food and Agriculture	Supporting	Supporting	-
Total Local Action Reductions		**189,399**	**275,273**	

County of Riverside CAP (2019): Table A-7
R2 Measures and Associated Emissions Reduced from 2030 and 2050 Inventories (From CAP Table 5-1)

	2030 $MTCO_2e$ Reductions	2050 $MTCO_2e$ Reductions	PCAP Aligning Measure
Transportation			
R2-T1: Alternative Transportation Options	161,932	368,711	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements LT-9: Transit Oriented Development
R2-T2: Adopt and Implement a Bicycle Master Plan to Expand Bike Routes Around the County	2,234	5,086	LT-1: Bicycle Infrastructure Improvements
R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses	182,846	416,332	LT-3: Carshare & Carpool Programs
R2-T4: Electrify the Fleet	274,370	624,729	RT-3: Regional Zero Emission Vehicle (ZEV) Initiatives LT-10: Local ZEV Programs
Transportation Total	**621,382**	**1,414,858**	
Energy			
R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	Supporting	Supporting	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE2: Increase Community Participation in Existing Energy Efficiency Programs	16,845	28,091	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE3: Home Energy Evaluations	Supporting	Supporting	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE4: Residential Home Energy Renovations	11,749	19,592	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE5: Exceed Energy Efficiency in New Residential Units	39,408	318,632	LE-8: Reach Codes for New Buildings
R2-EE6: Energy Efficiency Training, Education, and Recognition in Commercial Sector	Supporting	Supporting	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs	31,878	67,730	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE8: Non-Residential Building Energy Audits	Supporting	Supporting	LE-3: Improve Energy Efficiency of Existing Buildings
R2-EE9: Non-Residential Building Retrofits	173,554	368,747	LE-3: Improve Energy Efficiency of Existing Buildings

County of Riverside CAP (2019): Table A-7
R2 Measures and Associated Emissions Reduced from 2030 and 2050 Inventories (From CAP Table 5-1)

	2030 $MTCO_2e$ Reductions	2050 $MTCO_2e$ Reductions	PCAP Aligning Measure
R2-EE10: Energy Efficiency Enhancement of Existing and New Infrastructure	Supporting	Supporting	LE-5: Traffic & Street Light Upgrades
R2-EE11: Exceed Energy Efficiency in New Commercial Units	33,418	580,161	LE-8: Reach Codes for New Buildings
Energy Total	**306,851**	**1,382,953**	
Clean Energy			
R2-CE1: Clean Energy	34,204	34,204	LE-1: Expand Local Renewable Energy Production
R2-CE2: Community Choice Aggregation Program Reductions (If Implemented)	609,022	609,022	LE-2: Community Choice/Utility Renewable Electricity
Clean Energy Total	**643,226**	**643,226**	
Advanced Measures			
R2-L1: Tree Planting for Shading and Energy Saving	13	22	LE-6: Shade Trees
R2-L2: Light-Reflecting Surfaces for Energy Saving	1,845	3,294	**None Identified**
Advanced Measures Total	**13**	**22**	
Water Efficiency			
R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	5,666	10,114	LW-1: Increase Recycled Water Use SW-1: Water Conservation Measures
R2-W2: Exceed Water Efficiency Standards	116	206	SW-1: Water Conservation Measures
Water Efficiency Total	**5,781**	**10,320**	
Solid Waste			
R2-W1: Reduce Waste to Landfills	88,362	157,742	SR-1: Recycling and Waste Diversion Mandates
Solid Waste Total	88,362	157,742	
Total Reductions	**1,667,460**	**3,612,416**	

Appendix B

Greenhouse Gas Inventory Methods

Appendix B explains the methodologies used to calculate the greenhouse gas (GHG) inventory for each of the subregions and each of the economic sectors.

Appendix B also includes the methodologies used to estimate the GHG reductions from the Regional Measures described in Chapter 4.

Coachella Valley Association of Governments

Activity data and emissions can be scaled up from local greenhouse gas (GHG) inventories that are similar in scope to the desired inventory, or they can be scaled down from state, regional, or national level data using the appropriate scaling factors related to geography or reporting year.

According to the GHG Protocol for Cities,[1] inventory data can be scaled using the following formula:

$$Inventory\ Data = (Factor\_(Inventory\ Data))/(Factor\_(Available\ Data)) \times Available\ Data$$

In this formula, $Available\ Data$ refers to the activity or emissions data available that needs to be scaled, while $Inventory$ is the activity or emissions data for the desired geographic area. *Factor* is the scaling factor data point for either the inventory data or the original available data. Potential scaling factors to use include, but are not limited to, activity data, population, or gross domestic product.

To estimate the Coachella Valley Association of Governments (CVAG) 2018 GHG inventory for buildings and agriculture, a top-down approach was used of taking inventory data for the State of California and scaling down to Coachella Valley. The lack of complete GHG inventories for all the localities within CVAG prevented the use of a bottom-up approach of scaling up from local GHG inventories that are similar in scope. To estimate the CVAG 2018 GHG inventory for waste, this same top-down approach was used to estimate landfill and solid waste treatment data, but the wastewater treatment emissions data was scaled up from localities that comprise the Coachella Valley.

For the top-down analysis, state-wide inventory data from the California Air Resources Board (CARB[2]) was used, which was categorized by economic sector for the year 2018 for buildings, agriculture, and waste. Population was used as the scaling factor for buildings and waste, and crop acreage was used as the scaling factor for agriculture. The emissions data from CARB were provided in units of a million metric tons of carbon dioxide equivalent ($MMTCO_2e$) and GWP values were used from AR4. For the CVAG inventory, data was converted to metric tons of carbon dioxide equivalent ($MTCO_2e$) and global warming potential (GWP) values from AR5 were used. The methodology for the GHG inventory for each individual category is described in more detail in the sections below.

1 GHG Protocol. “GHG Protocol for Cities.” https://ghgprotocol.org/ghg-protocol-cities.

2 CARB. “Current California GHG Emission Inventory Data | California Air Resources Board.” California Air Resources Board, 2023. https://ww2.arb.ca.gov/ghg-inventory-data.

Buildings

Categories Included

For the CVAG 2018 buildings GHG inventory, fuel combustion emissions data for existing buildings were used from CARB for California's commercial, industrial, and residential economic sectors. For residential buildings, combustion emissions from natural gas, distillate, kerosene, biodiesel, renewable diesel, wood, and global warming potential (GWP) were included. For commercial buildings, combustion emissions from natural gas, distillate, kerosene, gasoline, biodiesel, ethanol, and LPG were included. For industrial buildings, combustion emissions from natural gas, distillate, kerosene, gasoline, biodiesel, ethanol, LPG, propane, and residual fuel oil were included. The state-wide data from CARB was provided in $MMTCO_2e$ and used GWP values from AR4. That data was converted into $MTCO_2e$ using GWP values from AR5.

Scaling

To scale down from the state-wide existing buildings emissions data to CVAG buildings emissions data, population was used as the scaling factor in the following formula:

$$CVAG\ Buildings\ Data\_(2018) = (CVAG\ Population\_2018)/(CA\ Population\_2018) \times CA\ Buildings\ Data\_2018$$

2018 population data for California[3] and Coachella Valley[4] was pulled from the U.S. Census Bureau's American Community Survey.

To calculate electricity emissions for buildings for CVAG, electricity consumption data was used for Riverside County's residential and non-residential buildings in 2018 from the California Energy Commission (CEC).[5] This electricity consumption data was given in gigawatt hours (GWh), which was converted into megawatt hours (MWh) and then multiplied by the eGRID2018[6] CO2e electricity emissions factors for California in MTCO2e/MWh, which was adjusted to align with AR5 GWPs.

Scaling

To scale down from the Riverside County buildings electricity emissions data to CVAG data, population was used as the scaling factor in the following formula:

$$CVAG\ Buildings\ Data\_(2018) = (CVAG\ Population\_2018)/(Riverside\ Population\_2018) \times Riverside\ Buildings\ Data\_2018$$

3 United States Census Bureau. "S0201: Selected Population Profile in the United States." United States Census Bureau, 2024.

4 United States Census Bureau. "DP05: ACS Demographic and Housing Estimates." United States Census Bureau, 2024. https://data.census.gov/table?g=060XX00US0606590520&y=2018.

5 California Energy Commission. "Electricity Consumption by County." California Energy Commission, 2024. https://ecdms.energy.ca.gov/elecbycounty.aspx.

6 https://www.epa.gov/sites/default/files/2020-01/documents/egrid2018_summary_tables.pdf

2018 population data for Riverside[7] and Coachella Valley[8] was pulled from the U.S. Census Bureau's American Community Survey.

Non-residential building electricity consumption data from CEC was not broken out into commercial and industrial for Riverside County, so it was assumed that the ratio of commercial and industrial emissions to the total non-residential building combustion emissions data from CARB was the same for non-residential electricity emissions. The amount of electricity emissions was calculated for commercial and industrial sectors for CVAG by applying this ratio to the total non-residential electricity emissions data scaled down to CVAG from Riverside County. This calculation is shown in the table below:

Ratio of non-residential electricity building emissions	**2018**
Commercial	= CVAG commercial combustion emissions/Total CVAG non-residential combustion emissions = 0.53
Industrial	= CVAG industrial combustion emissions/Total CVAG non-residential combustion emissions = 0.47

Agriculture

Categories Included

For the CVAG 2018 Agriculture GHG inventory, state-wide data was used from CARB's Agriculture & Forestry economic sector for agriculture residue burning, agriculture soil management, enteric fermentation, histosol cultivation, manure management, and rice cultivation emissions for 2018. State-wide agriculture energy use emissions from CARB were excluded in our analysis because this was fuel combustion data largely from vehicle transportation. The state-wide data from CARB was provided in $MMTCO_2e$ and used GWP values from AR4. That data was converted into $MTCO_2e$ using GWP values from AR5.

Scaling

To scale down from state-wide agriculture data to CVAG agriculture data, total crop acreage was used as the scaling factor in the following formula:

$$\begin{aligned} &CVAG\ Ag\ Data\_(2018) \\ &= (CVAG\ Crop\ Acreage\_2018)/(CA\ Crop\ Acreage\_2018) \\ &\times CA\ Ag\ Data\_2018 \end{aligned}$$

7 United States Census Bureau. "Census Bureau Tables." Accessed January 26, 2024. https://data.census.gov/table?t=Populations%20and%20People&g=050XX00US06065_060XX00US0606590520&y=2018.

8 United States Census Bureau. "DP05: ACS Demographic and Housing Estimates." United States Census Bureau, 2024. https://data.census.gov/table?g=060XX00US0606590520&y=2018.

2018 crop acreage data for California came from the California Department of Food and Agriculture's 2018-2019 Agricultural Statistics Review[9] and 2018 crop acreage data for CVAG came from the Coachella Valley Water District 2018 Crop Report.[10]

Waste

Landfills and Solid Waste Treatment

Categories Included

For the CVAG 2018 waste GHG inventory, state-wide data from CARB was used within California's broader industrial economic sector for landfills and solid waste treatment for 2018. These categories were selected to include all emissions related to human waste for the state of California. The state-wide data from CARB was provided in $MMTCO_2e$ and used GWP values from AR4. That data was converted into $MTCO_2e$ using GWP values from AR5.

Scaling down

To scale down from state-wide landfill and solid waste treatment data to CVAG data, population was used as the scaling factor in the following formula:

$$\begin{aligned} CVAG\ Waste\ Data\_(2018) \\ &= (CVAG\ Population\_2018)/(CA\ Population\_2018) \\ &\times CA\ Waste\ Data\_2018 \end{aligned}$$

2018 population data for California[11] and Coachella Valley[12] was pulled from the U.S. Census Bureau's American Community Survey.

Wastewater Treatment

Wastewater treatment emissions were calculated using socioeconomic data provided by Fehr & Peers and the International Council for Local Environmental Initiatives (ICLEI) U.S. Community Protocol Appendix F, *Wastewater and Water Emissions Activities and Sources*.[13] Calculated emissions include methods WW.8, WW.11.b, WW.12.b, and WW.15.1 from ICLEI Appendix F. These methods use population data as an input and emissions were calculated for each city within the CVAG region.

9 CDFA. "California Agricultural Statistics Review 2018-2019," 2019. https://www.cdfa.ca.gov/statistics/PDFs/2018-2019AgReportnass.pdf.

10 CV Water District. "Coachella Valley Water District 2018 Crop Report," 2018. https://www.cvwd.org/ArchiveCenter/ViewFile/Item/779.

11 United States Census Bureau. "S0201: Selected Population Profile in the United States." United States Census Bureau, 2024. https://data.census.gov/table/ACSSPP1Y2018.S0201?q=S0201&g=040XX00US06&tid=ACSSPP1Y2019.S0201.

12 United States Census Bureau. "DP05: ACS Demographic and Housing Estimates." United States Census Bureau, 2024. https://data.census.gov/table?g=060XX00US0606590520&y=2018.

13 ICLEI, 2013. US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Appendix F: Wastewater and Water Emission Activities and Sources. Available at: https://icleiusa.org/us-community-protocol/

On-road Transportation

The transportation sector includes emissions from fuel (gasoline, diesel, and natural gas) combusted by on-road passenger vehicles and trucks. Emissions from passenger vehicles and trucks are estimated based on daily vehicle trips and vehicle miles traveled (VMT) by each vehicle type. VMT for the metropolitan statistical area (MSA) was estimated using a trip-based travel forecasting model called RIVCOM, which is the most recent travel demand model for forecasting travel demand in Riverside County and which reflects the most recent Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) and associated Sustainable Communities Strategy (SCS). RIVCOM was used by Fehr and Peers to analyze the transportation network and socioeconomic data such as population, household, and employment, to forecast daily vehicle trips and VMT for each traffic analysis zone (TAZ) within the MSA.[14]

The RIVCOM model has a base year of 2018 and horizon year of 2045. VMT for the inventory year was linearly interpolated from the 2018 and 2045 model values. Fehr & Peers utilized the Regional Targets Advisory Committee (RTAC) VMT Calculation, which is also referred to as the half-accounting method. Using this methodology, 100% of the VMT with two trip ends within a jurisdiction is attributed to that agency, 50% of the VMT with only one trip end is allocated to the jurisdiction (the other 50% is allocated to the jurisdiction where the other trip end is located), and no VMT is allocated for trips that simply pass-through the city. This method is considered state-of-the-practice for use in climate action plans (CAPs) as it allocates the VMT that specific agencies can control to that specific agency as part of the inventory.

Fehr & Peers developed an annualization factor to convert typical weekday daily VMT to annual VMT. This was particularly important for the CVAG region, as the region experiences increases in population during the winter months and the region hosts special events (music festivals, golf tournaments, tennis tournaments, etc.) that can significantly affect VMT generation throughout the year.

To estimate this annualization factor, StreetLight data, which is available through the SCAG data portal, was utilized. Fehr & Peers used StreetLight volume estimates on segments surrounding the I-10 freeway. Specifically, data was pulled for daily volumes for all Tuesdays through Thursdays in the month of March (2022) and annual volumes for all days in the calendar year 2022. The March volumes were used to estimate daily volumes on these roadway segments which would be representative of volumes that are estimated out of the travel demand model. The annual volumes were divided by the “typical March” weekday volume to develop an annualization conversion factor assuming these volumes were a proxy for VMT. The conversion

14 VMT estimates for large urban areas are commonly developed using regional travel demand models. These models are developed and periodically updated, calibrated, and validated for use in long range infrastructure planning, environmental impact assessments, and air quality conformity analyses by local and regional agencies. Trip-based travel forecasting models generate (output) daily vehicle trips for each TAZ across various trip purposes based on inputs such as the transportation network and socioeconomic data such as population, household, and employment. SCAG staff maintain a regional travel demand model that uses a four-step model process to arrive at a set of forecast vehicle trips based on the data described above.

factor developed for this assessment was 321; or, to get from daily model VMT to annual VMT, it should be multiplied by 321 days.

Emissions were calculated using CARB's EMission FACtors 2021 model (EMFAC2021).[15] EMFAC2021 generates vehicle emission rates by area, year, vehicle type, fuel type, speed, and other parameters. EMFAC2021 was run for Riverside County for 2018 in "emission rate" mode to generate vehicle travel emission factors for all vehicle types and fuel types for aggregated (average) speeds. The EMFAC vehicle type categories were aligned with the categories of VMT provided by Fehr & Peers (passenger and truck).[16] The EMFAC emission factors by vehicle type and fuel assigned to passenger VMT and truck VMT were then weighted using region-wide VMT and trip generation profiles for each vehicle type modeled in EMFAC2021.[17] GHG emissions were then calculated by multiplying the weighted emission factors for passenger vehicles, trucks, and buses by the origin-destination VMT for passenger vehicles and trucks supplied by Fehr & Peers.

Offroad Transportation and Equipment

The CARB OFFROAD2021 model was used to estimate fuel use for off-road vehicles and equipment at the county level. The following vehicle classes were included in the inventory: construction and mining, industrial, and transportation refrigeration units. For apportioning fuel use to the CVAG region, regional employment data was obtained from Riverside County Traffic Analysis Model (RIVTAM) as provided by Fehr & Peers.

Countywide fuel consumption values from the OFFROAD2021 model for diesel, gasoline, and natural gas were apportioned to the CVAG cities using employment data. For example, countywide fuel consumption for construction equipment was apportioned to the cities using the pro-rata share of region-wide construction employment for each city (e.g. the City of Blythe had 0.5% of total countywide construction jobs in 2018, so 0.5% of total county fuel use for construction equipment was assigned to the City of Blythe).

Once city-specific fuel use values were computed, heavy-duty vehicle GHG emission factors from the Environmental Protection Agency (EPA[18]) were applied to diesel, gasoline, and natural gas-powered equipment by city. Natural gas was converted from gallons to diesel gallon equivalent (DGE).

15 CARB, EMFAC2021 Model. 2021. Available at: https://arb.ca.gov/emfac/emissions-inventory/4c9f04282a1f85d62a27721058b5a3bb6fd22fb9. Accessed October 2021.

16 The "passenger vehicle" category corresponds to EMFAC vehicle categories LDA, LDT1, LDT2, MCY, and MDV. The "trucks" category corresponds to EMFAC vehicle categories LHDT1, LHDT2, MHDT, HHDT.

17 For example, if the LDA vehicle type represents 70% of VMT at an emission rate of 300 grams CO2 per mile and the LDT1 vehicle type represents 30% of VMT at an emission rate of 350 grams CO2 per mile, the VMT-weighted emission rate for LDA and LDT1 vehicles combined is calculated as follows: 70% * 300 + 30% * 350 = 315 grams CO2 per mile.

18 USEPA, April 2014. Emission Factors for GHG Inventories. Available at: https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf.

Water

Water and electricity consumption data were obtained from the 2020 Coachella Valley Regional Urban Water Management Plan (RUWMP) [19], the City of Blythe's 2020 Urban Water Management Plan (UWMP) [20], and the Coachella Valley Water District's Climate Action and Adaptation Plan.[21]

The RUWMP and City of Blythe UWMP contain electricity use data for each water agency within the CVAG region. Emissions were calculated by multiplying electricity use by the 2018 emission factor (in pounds of CO_2e/MWh) for either Southern California Edison (SCE) or Imperial Irrigation District, depending on the electricity provider for each water agency. Region-wide emissions were apportioned to each CVAG city based on the service population of each water agency.

San Bernardino Council of Governments

Below is a brief summary of the methods used to develop the 2016 GHG inventory for the San Bernardino Council of Governments (SBCOG)/San Bernardino County Transportation Authority (SBCTA) in the 2021 SBCTA climate action plan (CAP). To read about the methodology in more detail, please reference the 2021 SBCOG/SBCTA CAP and associated appendices.[22]

The 2021 SBCOG/SBCTA CAP developed a GHG emissions inventory for 2016 from the following sources:

- Building energy use (including the subsectors of residential and non-residential)
- Light/medium-duty vehicles
- Heavy-duty vehicles
- Off-road equipment
- Agriculture
- Solid waste management
- Wastewater treatment
- Water transport, distribution, and treatment
- Stationary fuel combustion at industrial sources (i.e., stationary sources)

SBCOG and its jurisdictions, with the assistance of ICF and LSA, developed 2016 community GHG inventories and forecasted 2030 and 2045 GHG emissions for each jurisdiction. The

19 Coachella Valley Water District, 2020. 2020 Coachella Valley Regional Urban Water Management Plan. Available at: https://www.cvwd.org/DocumentCenter/View/5482/Coachella-Valley-RUWMP.

20 City of Blythe, 2020. 2020 Urban Water Management Plan. Available at: https://www.cityofblythe.ca.gov/DocumentCenter/View/1657/2020-Urban-Water-Management-Plan-Final-Draft-?bidId=.

21 Coachella Valley Water District, September 2021. Climate Action and Adaptation Plan. Available at: https://www.cvwd.org/DocumentCenter/View/5670/CVWD-Climate-Action--Adaptation-Plan-9282021?bidId=

22 SBCTA. "San Bernardino County Regional Greenhouse Gas Reduction Plan." SBC, March 2021. https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/.

boundaries of the inventory are defined as activities associated with specific jurisdictions. Emissions for a particular source were included in a jurisdiction's inventory if the source of emissions occurs within the geographic boundaries of the jurisdiction, the emissions are associated with land use in the geographic boundary (such as a portion of vehicle emissions that begin or end within the jurisdiction), or if the activity indirectly associated with a source of emissions occurs within the geographic boundaries of the jurisdiction (such as electricity consumption or waste generation).

The 2016 inventories are based mostly on actual 2016 activity data, emission factors from 2016, and socioeconomic data (i.e., population, household, and employment) for the region. The inventories include all significant contributing sectors to GHG emissions, based on the guidelines of the ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI–Local Governments for Sustainability USA, 2012). This inventory was developed with sufficient detail to support the identification of GHG-reduction measures specific to each jurisdiction's community emissions.

Western Riverside Council of Governments

Below is a brief summary of the methods used to develop the 2017 GHG inventory for Western Riverside Council of Governments (WRCOG) member jurisdictions as part of the 2022 WRCOG Subregional Climate Action Plan Update. More detail about the methodology can be found in the 2022 WRCOG Subregional CAP Update and associated appendices.[23]

The 2022 CAP Update included a GHG emissions inventory for 2017 for the following sources:

- Building energy use (including the subsectors of residential and non-residential)
- On-road transportation
- Wastewater
- Off-road equipment
- Water consumption
- Public transit
- Solid waste
- Freight rail
- Agriculture
- Stationary sources

The 2017 inventories were compiled following the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol) developed by ICLEI-Local

23 WRCOG, 2022. 2017 WRCOG Subregional Climate Action Plan Update. Available at: https://wrcog.us/DocumentCenter/View/9987/Climate-Action-Plan-Toolkit.

Governments for Sustainability USA (ICLEI).[24] Business-as-usual forecasts were prepared using a variety of methods, primarily by using socioeconomic data forecasts to estimate future activity and GHG emissions.

Data sources and methods were presented for the WRCOG Subregional Inventory, which includes regional emissions sources that were not apportioned at the city level (such as agriculture and freight rail), and for the individual city inventories, which include city-specific emissions sectors. Where possible, methodological consistency was maintained between the 2017 inventories described herein and the 2010 baseline inventories (Baseline Inventories) established in the 2014 WRCOG Subregional CAP. However, all emissions calculations for the WRCOG Subregional CAP 2017 inventories were completed in Excel workbooks, while the 2010 baseline emissions were calculated using ICLEI's Clean Air & Climate Protection Software (CACP).

Priority Regional Measure Quantification Methodology

Light Duty Electric Vehicle Infrastructure

Emissions reductions resulting from the expansion of electric vehicle (EV) charging infrastructure are estimated using the following methods and assumptions for Level 2 (7.5 KW) and DC Fast Chargers (DCFC; 150 KW).

To estimate electricity usage from EV chargers, the following formula was used:

$$(\#\ of\ chargers\ operational\ per\ year \times \#\ of\ charging\ sessions\ per\ day)/(Grid\ Loss\ Factor) \times days\ per\ year$$

Where:
# of chargers operational per year = variable
# of charging sessions per day = 0.4 for Level 2, 12.0 for DCFC
Grid Loss Factor = 0.9
Days per year = 365

Charging session assumptions were developed using data from Electrify America's Quarterly Reports submitted to the California Air Resources Board (CARB).[25] These reports include actual data on statewide chargers, including the sessions per charger per day. The calculation uses the average sessions per day for Statewide Level 2 Chargers and DCFC. The sum of Level 2 and DCFC electricity was then multiplied by the carbon intensity of electricity (expressed in pounds CO2e per MWh) based on the chargers' operational year, and converted to metric tons. The carbon intensity value uses historical data from EPA's Emissions & Generation Resource Integrated Database (eGRID) Tool[26] to project future year emission factors considering the State's Renewables Portfolio Standard (RPS) requirements for utilities to procure 60 percent

24 ICLEI, 2019. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2. Available at: https://icleiusa.org/us-community-protocol/.

25 CARB, 2023. Electrify America Reports. Available at: https://ww2.arb.ca.gov/resources/documents/electrify-america-reports.

26 EPA, eGRID. Available at: https://www.epa.gov/egrid.

renewable energy by 2030 and 100 percent renewable energy by 2045.[27] For example, electricity generated by EV chargers in year 2045 or later is assumed to produce zero emissions as the electrical grid is anticipated to be carbon-free.

After estimating electricity usage, the amount of displaced vehicle miles traveled (VMT) was calculated by dividing the total electricity usage by the fuel efficiency of an EV (expressed in kWh per mile).[28] The resultant VMT represents the number of miles traveled by EVs that would have otherwise been traveled by internal combustion engine (ICE) vehicles. The VMT was then multiplied by an annual weighted average emission factor (expressed in grams CO2e per mile) derived from EMFAC2021 and converted to metric tons.[29] [30] The net emissions reductions were then calculated as the difference between the emissions generated from charger electricity consumption and the emissions reductions from displacing ICE vehicles with EVs for each year that EV chargers are active.

The capital, electricity, maintenance, and network costs per EV charger were estimated as part of the measure. Capital, maintenance, and network costs were provided to SBCOG by ChargerHelp! For both Level 2 chargers and DCFCs.[31] Electricity costs per kWh and charging fees were estimated using information from CARB.[32] Energy demand and fixed charges were provided by the Energy Coalition.[33]

Building Decarbonization Measure

Municipal Buildings

To estimate the potential GHG emission reductions from a municipal building decarbonization program, a representative project was selected for modeling purposes. The representative project is a medium-sized, public service office building located in Riverside (City Hall), and is assumed to have 56,327.50 square feet. The facility has an assumed average annual energy consumption of 608,126.45 kWh and 7,795.83 therms. For purposes of estimating high-level GHG reduction potential across the region, it was assumed that all 54 member agencies in the region implement that project to calculate GHG savings. The following building decarbonization actions are assumed:

- Various energy efficiency measures (EEMs) that save 10 percent of the facility's annual electric consumption, resulting in 60,819 kWh of electricity savings.

27 CARB, Renewables Portfolio Standard. Available at: https://ww2.arb.ca.gov/our-work/programs/renewables-portfolio-standard.

28 The fuel efficiency of EVs were calculated by running EMFAC2021 in Emissions Inventory mode and dividing the energy consumption of passenger EVs by their total VMT. EMFAC2021 assumes that the fuel efficiency of passenger EVs does not increase over time.

29 CARB, EMFAC2021. Available at: https://arb.ca.gov/emfac/emissions-inventory.

30 The emission factors include all passenger vehicles (EMFAC vehicle types LDA, LDT1, LDT2, MCY, and MDV) within San Bernadino and Riverside Counties for each year from 2020 through 2045. EMFAC2021's latest project year is 2045, therefore emission factors for years after 2045 are assumed to be the same as 2045.

31 ChargerHelp! Correspondence with Josh Lee, SBCOG on February 15, 2024.

32 CARB, Electric Car Charging Overview. Available at: https://driveclean.ca.gov/electric-car-charging.

33 The Energy Coalition, 2024. Inland Empire Electric Vehicle Infrastructure Deployment Proposed Program Guide.

- Water heating sources changed from gas to electric via heat pump water heaters (HPWH). The study assumes the HPWH installation would result in annual natural gas savings of 1,400 therms and, since this is an electrification measure, an increase in annual electricity consumption of 13,000 kWh.
- Heating, ventilation, and air conditioning upgraded with heat pumps that results in annual electricity savings of 30,406 kWh and annual natural gas savings of 234 therms.
- Rooftop solar installation plus battery storage right-sized after EEMs installed. The study assumes 725 kW of solar PV installed and a battery power of 67 kW with a capacity of 305 kWh.

Results for One Representative Decarbonization Project

Project Components	Project Cost	Project Lifetime GHG Reduction ($MTCO_2e$)
Energy Efficiency Upgrades	$83,455	290
Heat Pump Water Heater Installation	$30,000	18
Heat Pump HVAC Installation	$449,015	216
Solar PV and Battery Storage Installation	$1,496,778	3,937
Total	**$2,059,248**	**4,461**

NOTES:

- Energy Efficiency, Heat Pump Water Heater and Heat Pump HVAC Emissions Factors: Greenhouse Gases Equivalencies Calculator - Calculations and References | US EPA
- Renewable Energy Emissions Factors: REopt

Estimated GHG savings associated with energy efficiency, decarbonization, and renewable energy were calculated using the National Renewable Energy Laboratory's (NREL) Renewable Energy Integration & Optimization (REopt®) toolbase. The REopt® platform helps optimize planning of generation, storage, and controllable loads to maximize the value and GHG reductions of integrated distributed energy systems for buildings.

Monthly energy consumption and associated cost data was used to calculate the average energy consumption, costs, and rates for the representative project. Additionally, facility characteristics were incorporated, such as gross floor area (sq.ft.), building use type, and average annual energy consumption for public agencies available in ENERGY STAR® Portfolio Manager® (ESPM) accounts shared by participating agencies and utilized similar publicly available facility characteristics available on the California Energy Commission's AB 802 Public Disclosure Dashboard.

Residential Buildings

The residential sector decarbonization measures were identified based on the CEC's upcoming Equitable Building Decarbonization (EBD) Direct Install Program, and complemented by regional stakeholder input on additional measures appropriate for the region (e.g., solar PV and storage).

The representative project assumed $50 million in funding from the EBD program and considered additional local, state, and rate payer rebate and incentive programs. After applying eligible incentive programs, the EBD funding was allocated to three different building types (single-family, multifamily, and manufactured) by a percentage (85 percent 10 percent, and 5 percent, respectively). The EBD program with complementary state, local, and rate payer incentive programs has the potential to reach over 2,200 homes or units throughout the region.

The GHG reduction potential of the direct install program was estimated by building type. To calculate the GHG emissions reductions of the direct install program, the energy efficiency or fuel switching measures' kWh or therm savings were obtained from the California Electric Technical Reference Manual (CAeTRM) for the three building types (single-family, multifamily, and manufactured). The projected kWh and therm savings are listed by measure and home type in the tables below.

Single-Family Home

Measure (Unit)	kWh Savings	Therm Savings	Typical Home Quantities
HPWH (each)	-1362	197.2	1
Air Source Heat Pump – Ducted (Per Ton)	-106.8	28.08	2.5
Electric/Induction Cooktop (Each)	-172	11.5	1
Electric Dryer (Each)	-270	17.8	1
Smart Thermostat (Household)	89.8	0	1
Weatherization and Insulation (Sq. Ft.)	0.8	0.04	1,500
Low Flow Showerhead (Each)	124	0	2
Low Flow Faucet (Each)	96.7	0	3

Multifamily Home

Measure (Unit)	kWh Savings	Therm Savings	Typical Home Quantities
HPWH (each)	-1112	174.4	1
Air Source Heat Pump – Ducted (Per Ton)	42.2	22.74	2.5
Electric/Induction Cooktop (Each)	-172	11.5	1
Electric Dryer (Each)	-1657	69.4	1
Smart Thermostat (Household)	85.1	0	1
Weatherization and Insulation (Sq. Ft.)	0.96	0.06	1,500
Low Flow Showerhead (Each)	138.5	0	2
Low Flow Faucet (Each)	80.5	0	3

Manufactured Home

Measure (Unit)	kWh Savings	Therm Savings	Typical Home Quantities
HPWH (each)	-1236	183	1
Air Source Heat Pump – Ducted (Per Ton)	52.9	25.4	2.5
Electric/Induction Cooktop (Each)	-172	11.5	1
Electric Dryer (Each)	-270	17.8	1
Smart Thermostat (Household)	92.7	0	1

Weatherization and Insulation (Sq. Ft.)	1.32	0.063	1,500
Low Flow Showerhead (Each)	138.5	0	2
Low Flow Faucet (Each)	80.5	0	3

To calculate the GHG emissions reduction for a typical single-family, multifamily, and manufactured home, the kWh and therm savings for each measure were converted to metric tons (MT) of CO_2 using conversion factors from Southern California Edison (1 kWh=0.000232 $MTCO_2$; 1 therm=0.005321 $MTCO_2$). To estimate the average annual GHG reduction by home type, the GHG equivalents of kWh and therm savings were multiplied by the typical home quantities of the unit of each measure. Finally, the GHG reduction estimate was multiplied by the assumed number of homes and/or units reached under the project.

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Appendix C

Authority to Implement

The Priority Climate Action Plan (PCAP) focuses on greenhouse gas (GHG) reduction measures for the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA), comprised of Western Riverside Council of Governments (WRCOG), San Bernardino County Transportation Authority (SBCTA)/San Bernardino Council of Governments (SBCOG), and Coachella Valley Association of Governments (CVAG).

This Appendix provides a review of the authority of the primary supporting agencies to implement the GHG reduction measures within the MSA. The primary supporting agencies are CVAG, SBCTA/SBCOG, WRCOG, County of Riverside, County of San Bernardino, incorporated cities within Riverside and San Bernardino counties, Southern California Association of Governments, South Coast Air Quality Management District, and Mojave Desert Air Quality Management District. All GHG measures within the PCAP (both regional measures and additional local measures) can be implemented by primary supporting agencies through existing regulatory and/or statutory authority.

General Law and Charter Cities

There are two types of cities within the Riverside-San Bernardino-Ontario Metropolitan Statistical Area: general law and charter cities. Both general law and charter cities are governed by California Government Code, particularly Title 4, Divisions 1−5; Article XI, §3 of the Constitution of California.

Cities have a wide range of planning and implementation authority and a wide range of activities relevant to climate action. These include key activities such as creating and implementing general plans and climate action plans among others; passing ordinances; providing services; building, operating, and maintaining infrastructure; providing incentives; and levying fees and taxes.

Southern California Association of Governments

The Southern California Association of Governments (SCAG), founded in 1965, is a Joint Powers Authority (JPA) under California state law, established as an association of local governments and agencies that voluntarily convene as a forum to address regional issues. SCAG is designated as a Metropolitan Planning Organization (MPO) under federal law, and as a Regional Transportation Planning Agency (RTPA) and a Council of Governments under state law.

The SCAG region encompasses six counties (Riverside, San Bernardino, Imperial, Los Angeles, Orange, and Ventura) and 191 cities, and covers over 38,000 square miles. As an MPO and RTPA, SCAG is tasked with developing long-range regional transportation plans including sustainable communities, strategy and growth forecast components, regional transportation improvement programs, regional housing needs allocations, and a portion of the South Coast Air Quality management plans. In 1992, SCAG expanded its governing body, the Executive Committee, to a 70-member Regional Council to help accommodate new responsibilities mandated by the federal and state governments, as well as to provide more broad-based representation of Southern California's cities and counties. With its expanded membership structure, SCAG created regional districts to provide for more diverse representation. The districts were formed with the intent to serve equal populations and communities of interest. Currently, the Regional Council consists of 86 members.

In addition to the six counties and 191 cities that make up SCAG's region, there are six County Transportation Commissions that hold the primary responsibility for programming and implementing transportation projects, programs, and services in their respective counties. Additionally, SCAG Bylaws provide for representation of Native American tribes and Air Districts in the region on the Regional Council and Policy Committees.

SCAG is responsible for key regional planning processes such as the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), leads a range of planning initiatives focused on sectors such as transit and goods movement, and provides grants and incentives to support local planning and infrastructure projects. SCAG draws its authority from various California Government Codes, particularly Title 1, Division 7, Chapter 5, Article 1.

County of Riverside

The County of Riverside is governed by various sections of the California Government Code, including but not limited to Title 3 (Counties) and Title 5 (Local Agencies), as well as the Charter of the County of Riverside and the County of Riverside Code of Ordinances. Founded in 1893, the County of Riverside covers 7,303 square miles. It boasts a working population of 1,042,800 people and a total population of 2,450,758, making it the 4th most populous county in CA, behind Los Angeles, San Diego, and Orange. There are 28 incorporated cities in the County of Riverside.

The County of Riverside is made up of 44 departments and is governed by a five-member elected Board of Supervisors, each representing a different district of the County. As a subdivision of the state, the County of Riverside is charged with providing numerous services for its residents and land, including law enforcement, tax collection, public health protection, public social services, elections, and flood control, as well as many others.

In addition to the multitude of public services the County provides, the Board directs County of Riverside departments to pursue and implement policies that will promote sustainability, benefit the environment, and improve public health. The County of Riverside draws its authority from various California Government Codes sections, including Title 3 (Counties) and Title 5 (Local Agencies), as well as the Charter of the County of Riverside and the County of Riverside Code of Ordinances.

County of San Bernardino

The County of San Bernardino is governed by various sections of the California Government Code, including but not limited to Title 3 (Counties) and Title 5 (Local Agencies), as well as the Charter of the County San Bernardino and the County of San Bernardino Code of Ordinances. Established in 1853, the County of San Bernadino has over 2.2 million residents and covers 20,105 square miles, making it the largest county by area in the contiguous United States. The County of Riverside stretches from eastern Los Angeles to the Arizona and Nevada borders. It is made up of 24 incorporated cities and other unincorporated areas.

The County of San Bernardino is made up of 42 departments, with an operating budget that exceeds $8.6 billion dollars. It is governed by a five-member elected Board of Supervisors, each representing a different district of the County. As a subdivision of the state, the County is charged with providing numerous services for its residents and land, including law enforcement, tax collection, public health protection, public social services, elections, and flood control, as well as many others. In addition to the multitude of public services the County provides, the Board directs County departments to pursue and implement policies that will promote sustainability, benefit the environment, and improve public health. This includes policies focused on transportation, non-motorized transportation, energy, and zero-emission buses, particularly for GHG reductions.

Coachella Valley Association of Governments

The Coachella Valley Association of Governments (CVAG) is governed by the California Government Code, particularly Title 1, Division 7, Chapter 5, Article 1. Founded in 1973, CVAG is the regional planning agency that coordinates government services within the Coachella Valley. By providing solutions to the common issues of the local governments and Tribes that are its members, CVAG promotes a better quality of life and balanced growth for residents of Central and Eastern Riverside County.

The CVAG region includes 10 cities, unincorporated areas of Riverside County, the Agua Caliente Band of Cahuilla Indians, and the Cabazon Band of Mission Indians. CVAG is governed by a 65-member General Assembly that includes the Riverside County Board of Supervisors, all mayors and council members of the incorporated cities in Eastern Riverside County, and five tribal members each from the Agua Caliente Band of Cahuilla Indians and the Cabazon Band of Mission Indians. CVAG governance is further supported by a 17-member executive committee that meets between sessions of the General Assembly. Executive Committee membership includes the Riverside County Board of Supervisors, mayors, and Tribal Council Chairs. City managers, the County of Riverside Chief Executive Officer, and the Tribal Chief Executive Officer serve as non-voting members. In addition, two members of SCAG's Regional Council are elected by the cities of Coachella Valley to serve as non-voting members.

As the recognized transportation planning agency with the Riverside County Transportation Commission (RCTC), CVAG is charged with preparing a Regional Transportation Plan (RTP) for the Coachella Valley. Central to this effort is the Transportation Project Prioritization Study (TPPS), which identifies and prioritizes transportation projects in the region. The projects within the TPPS are fed into a larger regional planning effort by SCAG. CVAG also manages and distributes funds under the Congestion Management Air Quality (CMAQ) program, programs transportation improvement projects, and administrates the region's Transportation Mitigation Fee Program.

CVAG draws its authority from various California Government Codes, particularly Title 1, Division 7, Chapter 5, Article 1.

San Bernardino County Transportation Authority and San Bernardino Council of Governments

SBCOG is governed by the California Government Code, particularly Title 1, Division 7, Chapter 5, Article 1. Formerly known as the San Bernardino Associated Governments, the San Bernardino County Transportation Authority and San Bernardino Council of Governments (SBCTA/SBCOG) were reformed as sister agencies in 2016, focusing on multimodal transportation initiatives and regional planning/policy, respectively, within San Bernardino County. SBCTA/SBCOG jurisdiction includes San Bernardino County's 24 cities and over 2.2 million residents.

Recognizing that many issues and concerns are not constrained by political boundaries, SBCTA/SBCOG focuses on regional matters. As a single entity, SBCTA consolidates the role of the County Transportation Commission, local transportation authority, and service authority for freeway emergencies and local congestion management. SBCOG serves as the Joint Powers Authority (JPA) that provides a forum for regional planning and policy issues, including transportation as well as housing, public health, energy, and sustainability. Collectively, the purpose of the SBCTA/SBCOG is to speak with a unified voice on important issues that affect its member agencies, better advocate for San Bernardino communities, and strengthen San Bernardino County's standing in the region and State. SBCTA/SBCOG is governed by a Board of Directors with representatives from 24 cities and towns, and 5 supervisorial districts of San Bernardino County. This governing board sets policy and program direction for the organization.

SBCTA/SBCOG draws its authority from various California Government Codes, particularly Title 1, Division 7, Chapter 5, Article 1.

Western Riverside Council of Governments

The Western Riverside Council of Governments (WRCOG) is governed by the California Government Code, particularly Title 1, Division 7, Chapter 5, Article 1. The purpose of WRCOG is to unify Western Riverside County so that it can speak with a collective voice on important issues that affect its members. Representatives from 18 cities, the Riverside County Board of Supervisors, and the Eastern and Western Municipal Water Districts have seats on the WRCOG Executive Committee, the group that sets policy for the organization, and the Riverside County Superintendent of Schools is an ex-officio member. WRCOG represents a population of approximately 1.4 million people.

Recognizing that many issues related to growth are not constrained by political boundaries, WRCOG focuses on a number of regional matters important to our future. By working together through its committee structure and utilizing resources, WRCOG is cost-effective by reducing duplication of effort, sharing information, enabling strong advocacy, and strengthening Western Riverside's standing in the region and the State. In all its efforts, WRCOG strives to "respect local control, provide regional perspective, and make a difference" to elevate the quality of life throughout the subregion. WRCOG draws its authority from various California Government Codes, particularly Title 1, Division 7, Chapter 5, Article 1.

WRCOG also oversees the Inland Regional Energy Network (I-REN). was established to administer, design, and deliver energy efficiency programs in Riverside and San Bernardino counties. Established in 2019 and approved in 2021 by the California Public Utilities Commission (CPUC), I-REN is a consortium of WRCOG, CVAG, and SBCOG, with a mission to provide energy programs and services to help meet local and state energy efficiency goals. I-REN activities are authorized by the CPUC, particularly Decision 12-11-015, Decision 16-08-019, Decision 18-05-041, and Decision 19-12-021.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is established and governed by the California Health and Safety Code, particularly Division 26, Part 3, Sections 40400 et seq. SCAQMD is the regulatory agency responsible for improving air quality for large areas of Los Angeles, Orange, Riverside, and San Bernardino counties, including the Coachella Valley. The region is home to more than 17 million people, or 44 percent of the population of the entire state of California.

The SCAQMD operates within a regulatory framework established by State and federal mandates aimed at addressing air quality concerns. The primary federal mandates that guide the SCAQMD's actions include the Clean Air Act (CAA) and associated amendments. These mandates empower the district to regulate and enforce air quality standards, reduce emissions, and protect public health and the environment.

The CAA requires SCAQMD to develop Air Quality Management Plans (AQMPs), which are the essential blueprints to meet the National Ambient Air Quality Standards (NAAQS). The 2022 AQMP includes new regulations and the development of incentive programs to support early deployment of advanced clean technologies.

In the area that the SCAQMD is responsible for, mobile sources—heavy-duty trucks, ships, airplanes, locomotives, and off-road equipment—account for 80 percent of nitrogen oxide (NOx) emissions. Stationary sources, such as power plants, refineries, and factories, are responsible for the remaining 20 percent. The majority of SCAQMD’s regulatory authority is for stationary sources with authority for fleets and indirect source measures to control mobile sources. The 2022 AQMP requires wide-spread adoption of zero-emission technologies across all mobile and stationary sources.

State law SB 2297 (Rosenthal) Chapter 1546 established SCAQMD’s Clean Fuels Program. The Clean Fuels Program supports the development and demonstration of clean technologies across the mobile source sectors to reduce air pollution and protect public health, especially in disproportionately impacted, low-income disadvantaged communities. SCAQMD also implements incentive programs to spur the transition to the cleanest available technologies, while supporting large-scale commercialization.

SCAQMD also has the authority to regulate stationary sources such as residential, commercial, and large industrial facilities. Building on existing rules and regulations, the 2022 AQMP includes control measures for residential combustion sources to reduce emissions from residential water and space heating, cooking devices, and other combustion sources. Similar control measures are proposed to reduce emissions from commercial buildings as well as small combustion engines and other equipment. Additionally, SCAQMD has large combustion source measures for industrial facilities and equipment such as boilers and process heaters, refineries, emergency standby engines, turbines, electricity generating facilities, landfills, incinerators, and other permitted equipment. In addition to rules and regulations, SCAQMD has incentivized the

transition to cleaner stationary source technologies such as residential heat pumps, commercial boilers, and other equipment.

SCAQMD is the regional agency responsible for local, state, and federal air quality mandates. SCAQMD has both the authority and mandate to reduce air pollution by all means feasible including regulations, rules, and clean technology development, demonstration, and deployment.

SCAQMD draws its authority from the California Health and Safety Code, particularly Division 26, Part 3, Sections 40400 et seq.

Mojave Desert Air Quality Management District

The Mojave Desert Air Quality Management District (MDAQMD) is established and governed by the California Health and Safety Code, particularly Division 26, Part 3, Sections 40400 et seq. Stretched out over more than 20,000 square miles of California's vast desert expanse, the MDAQMD is geographically the second largest of the state's 35 air districts. As the air pollution control agency for San Bernardino County's High Desert and Riverside County's Palo Verde Valley, the District has primary responsibility for regulating stationary sources of air pollution located within its jurisdictional boundaries. The District implements air quality programs required by state and federal mandates, enforces rules and regulations based on air pollution laws, and educates businesses and residents about their role in protecting air quality and the risks of air pollution.

The MDAQMD lies within the Mojave Desert Air Basin, which encompasses desert portions of Kern, Los Angeles, Riverside and San Bernardino counties. The District works to protect the health of nearly 600,000 residents by safeguarding the region's air quality. By partnering with the local communities and businesses, they implement regulations and programs to reduce air pollution and assist the region in attaining ambient air quality standards. This is accomplished through a comprehensive and common-sense program of planning, regulation, compliance assistance, enforcement, monitoring, and public outreach and education. The District consists of 40 dedicated staff members, including engineers, inspectors, planners, community relations, and other professionals, under the direction of the Executive Director/Air Pollution Control Officer.

Air Monitoring staff operates and maintains six monitoring stations—Barstow, Hesperia, Phelan, Trona, Twentynine Palms, and Victorville—within the District's 20,000+ mile jurisdiction. MDAQMD duties are authorized under the California Health and Safety Code, Division 26, Part 3, Chapter 13, Article 4, Sections 41230−41233.

Appendix D

LIDAC and Co-benefits Analysis Methods

This Appendix provides a summary of the methods for identifying Low-Income and Disadvantaged Communities (LIDACs) through the Climate and Economic Justice Screening Tool (CEJST), as well as the list of US Census tracts identified as LIDACs.

LIDAC Identification and Analysis

The CEJST was used to identify LIDACs within the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA). CEJST provides a ranking of burden indicators using percentiles by census tract. Census tracts qualified as a disadvantaged community (LIDAC) if they are above the 90th percentile for at least one CEJST burden indicator under eight categories, shown in **Table D-1** below and in Chapter 5 (Table 5-1):

Table D-1
CEJST Categories of Burden

Category	Disadvantaged Community Identification Communities are identified as disadvantaged if they are in census tracts that:
Climate change	Are at or above the 90th percentile for expected agriculture loss rate OR expected building loss rate OR expected population loss rate OR projected flood risk OR projected wildfire risk AND are at or above the 65th percentile for low income
Energy	Are at or above the 90th percentile for energy cost OR PM 2.5 in the air AND are at or above the 65th percentile for low income
Health	Are at or above the 90th percentile for asthma OR diabetes OR heart disease OR low life expectancy AND are at or above the 65th percentile for low income
Housing	Experienced historic underinvestment OR are at or above the 90th percentile for housing cost OR lack of green space OR lack of indoor plumbing OR lead paint AND are at or above the 65th percentile for low income
Legacy pollution	Have at least one abandoned mine land OR Formerly Used Defense Sites OR are at or above the 90th percentile for proximity to hazardous waste facilities OR proximity to Superfund sites (National Priorities List (NPL)) OR proximity to Risk Management Plan (RMP) facilities AND are at or above the 65th percentile for low income
Transportation	Are at or above the 90th percentile for diesel particulate matter exposure OR transportation barriers OR traffic proximity and volume AND are at or above the 65th percentile for low income
Water and wastewater	Are at or above the 90th percentile for underground storage tanks and releases OR wastewater discharge AND are at or above the 65th percentile for low income
Workforce development	Are at or above the 90th percentile for linguistic isolation OR low median income OR poverty OR unemployment AND more than 10 percent of people ages 25 years or older whose high school education is less than a high school diploma

NOTE:
Census tracts are considered low income if the percent of the population's household income is at or below 200 percent of the Federal poverty level.

SOURCE: CEQ, 2022 (https://screeningtool.geoplatform.gov/en/methodology#green-space).

CEJST census tract data for these indicators was downloaded for use in ArcGIS, to map LIDAC census tracts in San Bernardino and Riverside counties. In ArcGIS, subregional boundaries were added to show LIDAC census tracts in the region covered by the Western Riverside Council of Governments (WRCOG), the San Bernardino Council of Governments (SBCOG), and the Coachella Valley Association of Governments (CVAG). This data was exported to Microsoft Excel format, showing CEJST LIDAC census tracts by subregion. LIDAC census tracts were counted by subregion and divided by total census tracts (LIDAC and non-LIDAC) to provide a

percentage of LIDACs within WRCOG, SBCOG, and CVAG, as well as for the Riverside-San Bernardino-Ontario MSA. These counts and percentages are summarized in **Table D-2** below.

Table D-2
LIDAC Census Tracts by Subregion

Subregion	Total Census Tracts	LIDAC Census Tracts	Percent of LIDACs
WRCOG	366	133	36.3%
SBCOG	419	183	43.7%
CVAG	128	62	48.4%
Total	**913**	**378**	

SOURCE: CEQ, 2022.

To provide the overall percentage of LIDACs within the Riverside-San Bernardino-Ontario MSA (41 percent), LIDAC census tracts across all subregions were divided by total census tracts across all subregions.

The LIDAC identification also included counts and percentages of census tracts in WRCOG, SBCOG, and CVAG by indicator of burden across the eight CEJST categories. This is summarized in **Table D-3** below, and in Chapter 5 (Table 5-2)

Table D-3
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
Climate Change						
Greater than or equal to the 90th percentile for expected agriculture loss rate and is low income?	0	0.0%	3	0.7%	0	0.0%
Greater than or equal to the 90th percentile for expected building loss rate and is low income?	24	6.6%	14	3.3%	3	2.3%
Greater than or equal to the 90th percentile for expected population loss rate and is low income?	0	0.0%	2	0.5%	0	0.0%
Greater than or equal to the 90th percentile for share of properties at risk of flood in 30 years and is low income?	13	3.6%	12	2.9%	11	8.6%
Greater than or equal to the 90th percentile for share of properties at risk of fire in 30 years and is low income?	72	19.7%	53	12.6%	23	18.0%

Table D-3
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
Energy						
Greater than or equal to the 90th percentile for energy burden and is low income?	2	0.5%	15	3.6%	15	11.7%
Greater than or equal to the 90th percentile for PM2.5 exposure and is low income?	90	24.6%	115	27.4%	0	0.0%
Health						
Greater than or equal to the 90th percentile for asthma and is low income?	0	0.0%	10	2.4%	0	0.0%
Greater than or equal to the 90th percentile for diabetes and is low income?	6	1.6%	11	2.6%	5	3.9%
Greater than or equal to the 90th percentile for heart disease and is low income?	12	3.3%	10	2.4%	11	8.6%
Greater than or equal to the 90th percentile for low life expectancy and is low income?	9	2.5%	12	2.9%	3	2.3%
Housing						
Tract experienced historic underinvestment and remains low income?	0	0.0%	0	0.0%	0	0.0%
Greater than or equal to the 90th percentile for housing burden and is low income?	37	10.1%	49	11.7%	19	14.8%
Greater than or equal to the 90th percentile for share of the tract's land area that is covered by impervious surface or cropland as a percent and is low income?	0	0.0%	0	0.0%	2	1.6%
Share of homes with no kitchen or indoor plumbing (percentile)?	16	4.4%	17	4.1%	7	5.5%
Legacy Pollution						
There is at least one abandoned mine in this census tract and the tract is low income?	0	0.0%	0	0.0%	0	0.0%
There is at least one Formerly Used Defense Site (FUDS) in the tract and the tract is low income?	4	1.1%	13	3.1%	3	2.3%
Greater than or equal to the 90th percentile for proximity to hazardous waste facilities and is low income?	16	4.4%	19	4.5%	1	0.8%
Greater than or equal to the 90th percentile for proximity to superfund sites and is low income?	29	7.9%	16	3.8%	0	0.0%

Table D-3
CEJST LIDACs in WRCOG, SBCOG, & CVAG

CEJST – Categories and Indicators of Burden	WRCOG		SBCOG		CVAG	
	Count (#)	Percent (%)	Count (#)	Percent (%)	Count (#)	Percent (%)
Greater than or equal to the 90th percentile for proximity to Risk Management Plan (RMP) sites and is low income?	13	3.6%	26	6.2%	14	10.9%
Transportation						
Greater than or equal to the 90th percentile for diesel particulate matter and is low income?	15	4.1%	42	10.0%	0	0.0%
Greater than or equal to the 90th percentile for DOT transit barriers and is low income?	32	8.7%	36	8.6%	4	3.1%
Greater than or equal to the 90th percentile for traffic proximity and is low income?	22	6.0%	23	5.5%	0	0.0%
Water and Wastewater						
Greater than or equal to the 90th percentile for leaky underground storage tanks and is low income?	3	0.8%	0	0.0%	2	1.6%
Greater than or equal to the 90th percentile for wastewater discharge and is low income?	14	3.8%	6	1.4%	0	0.0%
Workforce Development						
Greater than or equal to the 90th percentile for households in linguistic isolation and has low high school attainment?	32	8.7%	49	11.7%	34	26.6%
Greater than or equal to the 90th percentile for low median household income as a percent of area median income and has low high school attainment	13	3.6%	29	6.9%	22	17.2%
Greater than or equal to the 90th percentile for households at or below 100% federal poverty level and has low high school attainment?	15	4.1%	33	7.9%	12	9.4%
Greater than or equal to the 90th percentile for unemployment and has low high school attainment?	45	12.3%	68	16.2%	26	20.3%

SOURCE: CEQ, 2022.

LIDAC Census Tracts

Provided below is a list of US census tracts identified as LIDACs through the CEJST, by subregion.

Table D-4
CEJST LIDACs in CVAG

CEJST LIDACs in CVAG (Census Tracts)	
6065044911	6065045303
6065045501	6065045609
6065045703	6065045707
6065044403	6065046900
6065044915	6065047000
6065044510	6065047201
6065045000	6065047202
6065045108	6065044806
6065045605	6065044807
6065044701	6065044907
6065044702	6065045209
6065044804	6065045502
6065045604	6065045704
6065045900	6065045705
6065046102	6065044930
6065045207	6065044931
6065045302	6065045120
6065045706	6065045118
6065046200	6065044515
6065049400	6065044516
6065049500	6065044518
6065045121	6065044520
6065045213	6065044521
6065045217	6065044522
6065045222	6065044605
6065045224	6065044606
6065045226	6065044923
6065940400	6065044926
6065941000	6065044509
6065941400	6065044507
6065045304	6065044916

Table D-5
CEJST LIDACs in SBCOG

CEJST LIDACs in SBCOG (Census Tracts)		
6071010415	6071025100	6071009400
6071011900	6071980200	6071009708
6071009710	6071001702	6071003200
6071010011	6071010015	6071001905
6071003612	6071006301	6071001813
6071003803	6071006401	6071000303
6071003804	6071008404	6071000824
6071004001	6071009300	6071000825
6071004003	6071010021	6071005300
6071004101	6071011700	6071005400
6071004103	6071007105	6071005500
6071004104	6071001400	6071004202
6071004302	6071002204	6071004401
6071004403	6071000304	6071006302
6071004404	6071008002	6071000903
6071004505	6071009108	6071001001
6071004507	6071009110	6071001600
6071004603	6071009112	6071002804
6071004604	6071009114	6071003102
6071005701	6071009116	6071003302
6071006203	6071009117	6071000201
6071006204	6071009904	6071003000
6071006604	6071009905	6071003404
6071007303	6071001002	6071003405
6071007305	6071001101	6071003503
6071001803	6071001305	6071003505
6071002901	6071001501	6071003509
6071002902	6071001503	6071003510
6071010018	6071001504	6071003606
6071009500	6071001706	6071003607
6071009713	6071001809	6071003609
6071009716	6071001812	6071003611
6071010409	6071006100	6071009908
6071010411	6071006700	6071009911
6071010700	6071007107	6071009912
6071010019	6071007408	6071009913

Table D-5
CEJST LIDACs in SBCOG

CEJST LIDACs in SBCOG (Census Tracts)		
6071010022	6071007403	6071010025
6071010012	6071006500	6071010026
6071007409	6071007200	6071010417
6071007410	6071007601	6071010419
6071007603	6071008100	6071010420
6071008710	6071009800	6071000301
6071009109	6071010013	6071002502
6071010423	6071010020	6071004201
6071010424	6071010413	6071006201
6071011001	6071010416	6071007407
6071011101	6071940100	6071009712
6071011203	6071000604	6071010410
6071011205	6071000605	6071002501
6071011206	6071000606	6071003401
6071011401	6071010014	6071003403
6071011403	6071010016	6071004900
6071011404	6071010023	6071005800
6071012001	6071010300	6071007000
6071012002	6071002401	6071005200
6071012103	6071002402	6071002101
6071003900	6071003700	6071002103
6071005600	6071004700	6071002306
6071012300	6071004800	6071002801
6071012400	6071005100	6071003301
6071012500	6071006402	6071002803

Table D-6
CEJST LIDACs in WRCOG

CEJST LIDACs in WRCOG (Census Tracts)						
6065042406	6065041004	6065041302	6065040204	6065041410	6065043512	6065043307
6065042407	6065041906	6065042010	6065043313	6065041600	6065043513	6065043309
6065042515	6065030300	6065042209	6065043401	6065041703	6065043274	6065043311
6065042904	6065040301	6065042210	6065043900	6065041704	6065043601	6065043404
6065043003	6065040605	6065046402	6065046500	6065040503	6065043602	6065031300
6065043308	6065044300	6065041813	6065046700	6065040808	6065043813	6065041203
6065043312	6065046404	6065044000	6065048800	6065040809	6065046403	6065042009
6065043405	6065042901	6065040904	6065042514	6065041500	6065042800	6065042517
6065043701	6065042902	6065048901	6065042404	6065042512	6065043220	6065042903
6065042723	6065031002	6065048902	6065042505	6065042507	6065043503	6065043310
6065043001	6065042508	6065040402	6065042510	6065042509	6065044102	6065043505
6065043005	6065043703	6065051300	6065042518	6065042513	6065042412	6065043507
6065043306	6065042405	6065030502	6065042519	6065042520	6065031701	6065044103
6065043403	6065042711	6065040502	6065042720	6065042521	6065042618	6065042409
6065030101	6065031502	6065030503	6065043006	6065042724	6065042740	6065042511
6065030103	6065031602	6065031402	6065044101	6065042729	6065042741	6065042516
6065031601	6065041101	6065030501	6065044200	6065042730	6065043008	6065042706
6065040101	6065041102	6065040202	6065030400	6065043239	6065031401	6065042717
6065043509	6065041301	6065040203	6065041202	6065043316	6065041001	6065044403

Appendix E

Workforce Analysis Methods

This Appendix includes a description of methods and assumptions that will be used to develop a regional labor force assessment, labor force requirements to implement Regional Measures, labor force credential requirements, availability of education and training resources, stakeholder identification, as well as parameters for good jobs. Although this workforce analysis is not complete in the Priority Climate Action Plan (PCAP), the methodology described above will be utilized in the Comprehensive Climate Action Plan (CCAP) to complete an occupational and skills gap analysis and create a workforce development strategy. This analysis will aid in identifying solutions to fill the gaps required to successfully implement the priority measures.

Workforce Analysis Methods

The Climate Pollution Reduction Grants (CPRG) from the Environmental Protection Agency (EPA) call for grantees to reduce climate pollution while building the clean energy economy in a way that benefits all Americans, provides new workforce training opportunities, and effectively addresses environmental injustices in disadvantaged communities. The first phase of the CPRG requires the development of a Priority Climate Action Plan (PCAP) to identify near-term and high impact projects to reduce greenhouse gas (GHG) and other air pollutant emissions. PCAP grant recipients are encouraged to conduct an analysis of workforce development activities needed to implement the priority measures included in the PCAP.

The four Regional Measures developed for Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) in the PCAP include: 1) Light Duty Electric Vehicle (EV) Infrastructure; 2) Building Decarbonization; 3) Goods Movement Decarbonization; and Electrification of Passenger Rail. Several different activities for these Regional Measures will directly impact the local workforce. For the Light Duty Electric Vehicle Infrastructure measure, labor will be required to install, operate, and maintain EV charging and hydrogen fueling stations, and complete electrical upgrades. The Building Decarbonization activities will require labor to perform energy efficiency upgrades to buildings, such as installing heat pump operated water heaters, solar panels, and battery storage systems. The Goods Movement measure will require labor to install EV charging stations at truck stops and electrifying cargo-handling equipment such as forklifts. Similarly, the Electrification of Passenger Rail measure will require contractors and laborers to install traction power stations. Successfully completing these measures will require a qualified workforce with the proper training and skills. Without proper workforce planning, the additional demand that these measures generate can lead to labor and skill shortages throughout the energy efficiency sector, in such occupations as electricians, plumbers, HVAC Technicians, and solar panel installers, among others.

To analyze the local workforce in preparation for these priority measures, it is vital to take multiple factors into account, including examining the structure of the current workforce and the workforce required to implement the measures, anticipated supply of labor appropriate to the measures, inventory of workforce education and training resources to shape and meet the demand for labor and skills gaps, and how workforce measures can benefit the communities that need the most help; these tasks are described below.

Labor Force Assessment

The first step in the labor force assessment will be to develop a taxonomy of all occupations relevant to San Bernardino and Riverside counties' energy and climate-related sectors and other sectors impacted by the priority measures. The taxonomy will follow the Standard Occupational Classification (SOC) system codes to standardize occupations across sources of employment data. The taxonomy of occupations will include jobs in the energy efficiency; renewable energy; weatherization; energy transmission, distribution, and storage; clean transportation; and adaptation and resilience across all relevant industry sectors, including utilities, manufacturing,

construction, wholesale trade, distribution, transportation, professional and business services, and others.

For each of the occupations identified in the taxonomy of energy and climate-related occupations, data will be collected on the number of jobs over the past five years, the current number of jobs, and projected number of jobs over the next ten years in San Bernardino and Riverside counties. The MSA will utilize the Lightcast labor analytics tool, which is commercial software that provides the most detailed information about skills, jobs, and supply and demand throughout the labor market. The Lightcast tool provides employment by detailed occupation (775 occupations by SOC code) and captures all employment, utilizing data from the Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) program, and also including Non-QCEW Employees, Self-Employed, and Extended Proprietors. This will capture payroll and non-payroll workers, providing a more accurate measure of employment than that typically provided by public government data. Along with the number of jobs by detailed occupation, the MSA will collect the median hourly and annual wage, location quotient, annual openings (new jobs and replacement jobs), and the demographic composition of the workforce for each occupation related to clean energy and climate, also using the Lightcast labor market analytics tool.

Labor Force Requirements to Implement Regional Measures

To capture projected employment change, employment projections by year from 2023−2033 for all identified occupations will be collected utilizing Lightcast data, leading forecasting techniques, and information on the MSA's priority measures. The priority measures will affect demand for work in energy and climate-related occupations and should be considered in projecting future employment levels. The employment projections along with the data collected on job skills, knowledge, and credentials (described below) will be used to identify potential future gaps in skill supply and demand in the energy and climate-related sectors in San Bernardino and Riverside counties. The skills gap analysis will be developed for the CCAP.

Skills, Knowledge, Ability, and Credential Requirements/Changes. In addition to the data above, data will also be collected on clean energy and climate-related skill and knowledge requirements, and educational/training/credential requirements. This information will be gathered from real-time job posting analytics from the Lightcast tool and from O*NET, the primary public source of occupational information from the Department of Labor. By utilizing Lightcast and O*NET, detailed descriptions of the tasks, technology skills and other skills, knowledge, and the education and credentials of the workforce, as they relate to clean energy and climate-related job functions will be collected and examined. This analysis will inform decision-making related to prioritizing training, education, and credentials needed for these jobs to help create a workforce capable of meeting the MSA's PCAP measures and goals. An important component of this task will be to identify the changes in skills and knowledge requirements, and educational/training/credential requirements that the MSA's PCAP measures, and new and emerging technologies in the energy sector, will generate.

Determine how the MSA's PCAP measures will affect skills, knowledge, and educational/training/credential requirements for work in the energy and climate-related occupations. As noted above, the MSA's PCAP priority measures will have impacts on the labor market, as demand for some workers will increase. To determine how these policies will affect labor demand for clean energy and climate-related occupations, the MSA will conduct an extensive literature review of existing academic studies and industry reports on the clean energy economy to examine how these policies may impact the labor market. The MSA will also utilize current job postings data from the Lightcast labor analytics tool to examine the skills, knowledge, and credentials that employers are currently requiring from the labor force for the relevant occupations and sectors in San Bernardino and Riverside County.

Inventory of Education and Training Resources

To examine San Bernardino and Riverside counties' workforce training systems and other workforce assets, a workforce training asset map will be developed that identifies programs and entities that provide training, instruction, and educational pathways relevant to the skills needed for the priority measures in the two counties. This information can be leveraged to support workforce development initiatives to address any shortage of workers with the relevant skill sets, ultimately filling the workforce competency gap.

To identify and collect data on education and training resources, the Integrated Post-Secondary Education Data System (IPEDS) from the National Center for Education Statistics will be utilized. IPEDS provides information, such as enrollment and completions by educational/training program from every education and training provider that participates in the federal student financial aid programs.

[1] These include universities, colleges, private for-profit institutions, community and technical colleges, vocational institutions, and non-degree-granting institutions. IPEDS maps each educational and training program to Classification of Instructional Programs (CIP) codes. CIP codes provide a taxonomic scheme that supports the accurate tracking and reporting of fields of study and program completion activity. The MSA will map each relevant occupation by SOC code to a CIP code and compile all the educational institutions and training providers that provide programs in the occupations relevant to the priority measures. The number of completions in those programs over the past three years will be collected to help inform the supply of labor that is available to support the priority measures.

The MSA will supplement IPEDS data with research that identifies other workforce training assets, such as apprenticeships and training provided by employers and labor unions. For example, the MSA will use the U.S. Department of Labor Registered Apprenticeship Partners Information Database System (RAPIDS) to identity relevant apprenticeship programs throughout San Bernadino and Riverside counties.

1 About IPEDS.

Utilizing the data provided by the sources above, the workforce training asset map will identify the following:

- All training/educational programs offered in San Bernadino and Riverside counties that train for occupations relevant to the priority measures
- Description of each program and the competencies offered
- Annual program enrollment and completions
- Program capacity for enrollment, where available

Identify Stakeholders

Effective workforce development requires the engagement and participation of all parties in the workforce supply chain. Stakeholders that will be engaged to inform the workforce development activities include educational institutions who are training the workforce; workforce development boards who are supplying new and incumbent workers; community organizations who are encouraging and supporting the supply of workers to be trained; labor unions and employers who will hire the workers and who best understand the knowledge, skills, and credentials required for successful employment; and policy makers who set goals and incentivize activities toward achieving climate and employment targets, including ensuring that the needs of underserved communities are addressed.

Focus on Good Jobs Principles and Underserved Communities

The workforce assessment will analyze the barriers that underserved communities face and develop strategies for ensuring equitable access to training and employment opportunities created by the priority measures, focused on the Good Job Principles identified by The US Department of Commerce and Department of Labor.[2]https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?WOPISrc=https://us-partner-integrations.egnyte.com/msoffice/wopi/files/bf10133c-c44d-4cc1-b163-1e0fd6351f8c Underserved communities in San Bernardino and Riverside County will be identified using the U.S. Department of Energy (DOE) Climate and Economic Justice Screening Tool.[3] This tool identifies census tracts that DOE has categorized as disadvantaged communities based on a number of burdens, including climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development, and considers socioeconomic characteristics. A census tract is considered disadvantaged if it meets one burden threshold and the associated socioeconomic threshold.

2 https://www.dol.gov/general/good-jobs/principles.

3 https://screeningtool.geoplatform.gov/en/#6.57/34.05/-117.655.

Preparation for CCAP

The data collected above will form the foundation to complete an occupational and skills gap analysis and create a workforce development strategy for the CCAP that identifies solutions to fill the gaps required to successfully implement the priority measures.

The MSA will model trends in occupations and skills and credentials that will be required to achieve CCAP goals. Coupled with labor and economic analysis, this will help identify gaps in the workforce, both quantitative and qualitative. This will then lead to opportunities for a Sector Strategy approach to engaging stakeholders and ensuring that a framework is in place to address the gaps needed to successfully implement the priority measures.

The MSA will bring key stakeholders together for a listening session, primed by the data collection, to learn and assimilate what each stakeholder group brings to the shaping of the workforce and what their needs and gaps are. These stakeholders will include policymakers and implementers, employers, labor unions, educators, public workforce partnerships, and community-based organizations representing underserved communities.

From the workforce data and gap analysis and input gathered from stakeholders, a framework will be developed that can form the basis for action to train and employ a workforce that is ready to meet the MSA’s climate goals and create a healthier, more prosperous environment.

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Appendix F

Engagement Summary

This summary provides an overview of the diverse engagement activities carried out during the development of the PCAP. A variety of engagement activities were employed during development of the PCAP that can be continued and expanded on as the CCAP is developed. The focus of the PCAP engagement process was directed towards forging connections with, and gaining feedback from, key stakeholders in San Bernardino and Riverside counties through a number of targeted channels. Alignment with the program's core objectives and timeline remained a guiding principle throughout the engagement process.

The CPRG program emphasizes the swift rollout of programs and funding opportunities. As such, the engagement process for the PCAP focused on identifying existing strategies, strategies that are in advanced stages of development, or strategies that are realistically expected to be in place during the 2025−2030 timeframe. Additionally, strategies that offer significant benefits for LIDACs, directly or indirectly, were a key focus of the engagement.

Engagement Activities in MSA

Engagement activities included building on SBCOG's and WRCOG's regional climate action planning engagement efforts as well as engagement efforts around other, climate-related programs and projects to enhance community-based organization (CBO) reach and input. Existing CAPs throughout the MSA were reviewed to identify community feedback from LIDACs that could be integrated into the PCAP and the subsequent CCAP. Engagement activities during PCAP development included focus groups with CBOs, development of a steering committee, participation in municipal meetings and agency committees throughout the region, a regional survey, events with city staff and elected officials, and one-on-one meetings with stakeholders.

PCAP Steering Committee

The PCAP Steering Committee, comprising regional, county, and local agencies, was established to facilitate regional coordination, gather input, and engage with a range of stakeholders and decision-makers during the development of the PCAP (participating agencies are listed in **Table F-1** below). Collectively, the agencies in the Steering Committee represent a broad cross-section of the MSA's population, economy, and regional GHG emissions across a number of sectors. While these agencies represent a range of responsibilities and authorities, they also play a key role in planning and implementing local and regional sustainability efforts that are in alignment with CPRG goals and objectives. The Steering Committee was developed in order to leverage the combined technical expertise and collective engagement capacity of the member agencies under the compressed PCAP timeline. In order to garner broader regional feedback, a variety of engagement approaches were used to expand engagement beyond these core agencies.

Table F-1
MSA Steering Committee

Level of Government	Agencies
Regional	Southern California Association of Governments (SCAG) Coachella Valley Association of Governments (CVAG) San Bernardino Council of Governments (SBCOG) Western Riverside Council of Governments (WRCOG) South Coast Air Quality Management District (SCAQMD) Mojave Desert Air Quality Management District (MDAQMD)
County	Riverside County San Bernardino County Riverside County Transportation Commission (RCTC) Riverside Transit Agency San Bernardino County Transportation Authority (SBCTA)
City	The 28 local jurisdictions within Riverside County The 24 local jurisdictions within San Bernardino County

Community Based Organizations

The Southern California Association of Governments (SCAG) led engagement and outreach activities in close coordination with key organizations in the MSA, including SBCOG, WRCOG, City of Riverside, and Inland Southern California Climate Collaborative (ISC3). Engagement with regional organizations and collaboratives is facilitating ongoing and future outreach to CBOs in the MSA, listed in **Table F-2**. Meetings and presentations with the ISC3 and University of California-Riverside (UCR) served to introduce the PCAP process, present GHG reduction strategies, elevate concerns of and for LIDACs, and gather feedback for implementing GHG reduction strategies. The ISC3 helped identify key organizations in the region for ongoing engagement in the PCAP and CCAP, as these organizations focus on climate change, climate and environmental justice, social justice, economic development, immigrant justice, health, transit equity, and natural resources.

Table F-2
Engagement with Community-Based Organizations in MSA

Riverside County
Center for Community Action and Environmental Justice
UC Riverside Center for Social Innovation
Citizens United for Resources and the Environment, Inc. (CURE)
GRID Alternatives
Riverside Community Services Foundation (RCSF)
Riverside Community Health Foundation
Community Access Center (CAC)
Riverside County Leadership Council for Justice and Accountability
Torres Martinez Indian Reservation
Soboba Band of Luiseno Indians
Parkview Legacy Foundation
Riverside Neighbors Opposing Warehouses (R-NOW)
The People's Collective for Environmental Justice
Alianza Coachella Valley
San Bernardino County
Center for Community Action and Environmental Justice
Inland Coalition for Immigrant Justice
Community Climate Connection
Inland Empire Resource Conservation District
Inland Congregation United for Change
Rolling Start, Inc.
El Sol Neighborhood Educational Center (El Sol)
Mary's Mercy Center, Inc.
Inland Empire Biking Alliance
Building Resilient Communities

Table F-2
Engagement with Community-Based Organizations in MSA

San Bernardino Community Service Center, Inc.
San Manuel Band of Mission Indians
Inland Southern California Climate Collaborative (ISC3)
Chicano Indigenous Community for Culturally Conscious Advocacy and Action (ChiCCCAA)

NOTES:
a. Several organizations serve the Inland Empire which includes both Riverside and San Bernardino Counties.

Focus groups with individual CBOs are being planned through March 2024, aligned with the PCAP and CPRG Implementation Grant timeline, and for the duration of the CCAP. The purpose of these focus groups is to inform the PCAP and subsequent CCAP that will cover all GHG sectors and include a full suite of strategies to meet long-range regional GHG targets and emphasize benefits to low-income and disadvantaged communities. The focus groups will provide important input to this process and towards implementation. The focus groups are engaging organizations specializing in key areas relating to the PCAP/CCAP, such as climate change and climate and environmental justice. Insights from the focus groups will help finalize the PCAP and will be incorporated into forthcoming implementation grant applications. This feedback will also inform the development of the CCAP and further engagement and outreach. To enable participation and respect the time and expertise of the participating CBOs, compensation is being offered for the time CBOs invest preparing for and participating in the focus groups.

Engagement with Municipalities and Stakeholder Agencies

SCAG actively engaged in municipal meetings and collaborated with agency committees across the region, which facilitated information gathering and feedback from local government staff and elected officials. This approach ensured alignment with regional objectives and helped garner support for regional action on GHG emissions reduction. Meetings and events held with municipalities and agencies were focused on sharing the goals and timeline of the CPRG program; emphasizing the importance of alignment between the PCAP and the expected implementation grant applications; highlighting the central goal of LIDAC benefits in the PCAP and any successful funding opportunities; and receiving feedback to inform the CPRG planning process and implementation applications.

Engagement activities included informational presentations, discussion groups, stakeholder sessions, one-on-one meetings, and in-person convenings. Ongoing coordination with COGs, agency committees, and other community organizations with a priority on those that represent LIDACs is planned for the Winter and Spring of 2024 to gather input that will help finalize the PCAP and inform the CCAP and implementation process. These engagements will also include input from community, academic, and private sector participants to inform the PCAP.

LIDAC Engagement

Targeted engagement was conducted to help increase participation of LIDACs in the CPRG process. Recognizing that cities or jurisdictions with a high percentage of LIDACs often have limited capacity for climate action planning and grant administration, engaging with COGs representing these areas has been an important element in ensuring LIDAC feedback is incorporated into the PCAP. Due to the resource constraints of many of these cities, COGs functioned as an important forum to facilitate feedback, and COG engagement with cities that represent a high proportion of LIDACs was prioritized. This approach is particularly effective for larger regions, like San Bernardino and Riverside County which have over 50 jurisdictions.

Frequently Asked Questions (FAQ)

A FAQ was developed to provide information of the CPRG program, answering the most common and frequently asked questions of the program. The FAQ page was distributed to SBCOG and WRCOG and its members, with informational response to questions on the CPRG funding availability, the PCAP and CCAP efforts, how the CPRG activities will build on existing efforts, key priorities for the MSA, key factors for selecting GHG reduction targets, how to access funding opportunities, and how to participate in the process.

Engagement Through Additional Programs and Projects

Additional climate-related projects and programs in the MSA provided a unique opportunity to bolster engagement with IE communities and incorporate input gathered through those processes as it relates to the PCAP. These include advisory groups and climate action conferences that convened during the PCAP planning process or prior to its start. SCAG leveraged connections through the COGs, ISC3, and City of Riverside to bring awareness to the PCAP and CCAP process, share GHG reduction targets and strategies, and gather input to inform the process.

Decarbonization Advisory Group

The City of Riverside convened a group of 60+ regional leaders including universities, the private sector, government, labor, trade organizations, non-profit organizations, public utilities, and community leaders in the area, to discuss decarbonization opportunities. Monthly meetings over 2022 and three public hearings led to the City of Riverside adopting an All-Electric Ordinance for new buildings constructed beginning January 1, 2023, as well as decarbonization and renewable energy studies and capital expenditures by UC Riverside, the City of Riverside, Riverside Community College, the private sector (i.e. Kaiser Permanente, etc.) and other stakeholders.

Climate Resilience Nexus Summit

In January of 2024, over 350 researchers, government officials, and community organization leaders convened at the Southern California headquarters of the CARB in Riverside to discuss climate change adaptation and resilience in the Inland Empire, state, and nation. On the heels of record-setting climate extremes like drought, extreme heat, and wildfires in California, the

Governor's Office of Planning and Research hosted the summit to explore opportunities to create the partnerships necessary to accelerate decarbonization efforts.

Climate Action Conference

In January of 2024, UCR hosted over 200 researchers, government officials, businesses, and community organization representatives to discuss climate change adaptation and resiliency technologies, policies, and actions in the Inland Empire. The conference attendees provided meaningful input and support towards decarbonization efforts in the realms of EV, buildings, and goods movement.

Climate Resilient Jobs for the Future Initiative

The Inland Empire Labor Institute and Plug in IE held their first working group meeting in February 2024, funded by a $75,000 Quality Green Jobs Phase 2 planning grant to convene a roundtable of up to 25 cross-sector partners involved in training for green jobs in the region. The IE region was one of nine selected in the United States. These partners include unions and employers, CBOs providing supportive services, local governments in Riverside and San Bernardino counties, and both regional workforce development boards. Green jobs include all occupations that are emerging, changing, or increasing in demand due to climate mitigation and adaptation efforts. Quality Green Jobs Regional Challenge is a multiyear CREST (Climate-Resilient Employees for a Sustainable Tomorrow) initiative led by Jobs for the Future (JFF) that will directly invest nearly $5 million in U.S. communities to develop regional quality green job strategies.

FISTS 2024: 4th IEEE Forum for Innovative Sustainable Transportation Systems

In February 2024, the Forum for Intelligent Transportation Systems and Sustainability (FISTS) brought over 80 researchers, government officials, business leaders, and stakeholders at UCR's Center for Environmental Research and Technology for a forum on transformative sustainable transportation systems. The goal of FISTS is to bring together world leaders in Intelligent Transportation Systems with a focus on the environment and sustainability. Papers will cover technological solutions, demonstrations, and policy. Transportation modes for on-road vehicles, transit systems, shared mobility, and freight systems were discussed with program topics focusing on carbon-neutral transportation solutions, decarbonization of goods movement, zero emissions vehicles and infrastructure, and integrated systems toward climate mitigation and adaptation.

Survey and Information Sharing

To further inform the CPRG planning process, SCAG is leading an on-going survey targeted at local jurisdictions to gather information on their climate action priorities and potential projects for priority implementation. As the survey is ongoing, the results are regularly updated and shared on a dedicated CPRG webpage (hosted by SCAG) to inform the PCAP. This also serves as a forum

to share local and regional priorities around climate action and justice, and potential projects that could support or be part of regional implementation efforts.

Analysis of Existing CAPs

Insights drawn from past planning processes, especially CAPs and other climate-related plans, played a significant role in informing the CPRG and shaping the targets and strategies in the PCAP. Using insights and lessons learned from previous efforts serves to leverage best practices during each phase of the planning process, especially as it relates to benefits to LIDACs.

The analysis of existing CAPs in the region have informed the MSA planning process, and showed that over half of WRCOG's 18 city governments participated in both the 2014 Subregional CAP and the 2021 update. Seven jurisdictions have also developed or are developing a local CAP, independent of the regional CAP efforts. In SBCOG, all jurisdictions were included in the 2014 Regional Greenhouse Gas Reduction Plan and the 2021 update. Seven jurisdictions in SBCOG have independently prepared, or are preparing, a local CAP.

The regional climate action planning efforts demonstrated extensive engagement processes with agencies, stakeholders, community members, and vulnerable population groups, including LIDACs, to inform the GHG reduction measures and strategies. Examples of engagement techniques used in the development of these plans included surveys, focus groups, an FAQ sheet, and subregional committee meetings. On the other hand, most older local CAPs did not specifically target LIDAC benefits, but measures common to these plans have potential to result in direct and indirect benefits to LIDACs during implementation. Recent CAPs from some jurisdictions, such as Ontario and Apple Valley, prioritize engagement and outreach as a key component for successful implementation of GHG measures. This is especially important for implementing the greatest priority projects from these and other local planning documents, many of which focused on improving commutes through transportation infrastructure upgrades, increasing awareness and access to clean energy, and encouraging active transportation. These actions offer additional opportunities for engagement with LIDACs. The planning and implementation of CAPs within the MSA, coupled with dedicated engagement efforts, provide helpful context as to each community's priorities around climate action and GHG reduction measures.