



Riverside-San Bernardino-Ontario MSA

Comprehensive Climate Action Plan

Coachella Valley Association of Governments, San Bernardino County Transportation Authority, and Western Riverside Council of Governments

The preparation of the Comprehensive Climate Action Plan was funded by the United States Environmental Protection Agency's (EPA) Climate Pollution Reduction Grant (CPRG). The fund was administered by SBCTA, the lead organization for the planning grant.

Acknowledgements

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Sub-Regional Planning Organizations



CVAG

Coachella Valley Association of Governments (CVAG)



San Bernardino Council of Governments (SBCOG)



Riverside Council of Governments (WRCOG)

Coordinating Entities



Southern California Association of Governments (SCAG)



Mojave Desert Air Quality Management District (MDAQMD)



South Coast Air Quality Management District (SCAQMD)

With Assistance from the Consultant Team



ICF



Environmental Science Associates (ESA)

Fehr & Peers

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Acronyms

BAU: Business-as-Usual
CAP: Climate Action Plan
CARB: California Air Resource Board
CBO: Community-Based Organization
CCAP: Comprehensive Climate Action Plan
CEQA: California Environmental Quality Act
CPRG: Climate Pollution Reduction Grants
CVAG: Coachella Valley Association of Governments
DCFC: Direct Current Fast Chargers
EPA: Environmental Protection Agency
EVCS: Electric Vehicle Charging Stations
GGRF: Greenhouse Gas Reduction Fund
GHG: Greenhouse Gas
HAPs: Hazardous Air Pollutants
IID: Imperial Irrigation District
IRA: Inflation Reduction Act
IREN: Inland Regional Energy Network
ISC3: Inland Southern California Climate Collaborative
MSA: Metropolitan Statistical Area
MTCO₂e: Metric Ton of Carbon Dioxide Equivalent
OGVs: Oceangoing Vessels
PCAP: Priority Climate Action Plan
POU: Publicly Owned Utility
SBCOG: San Bernardino Council of Governments
SBCTA: San Bernardino County Transportation Authority
SCAG: Southern California Association of Governments
SCE: Southern California Edison
VERA: Voluntary Emission Reduction Agreement
VMT: Vehicle Miles Travelled
WRCOG: Western Riverside Council of Governments
ZEV: Zero-emission Vehicle

TABLE OF CONTENTS

Comprehensive Climate Action Plan

Acknowledgements	ii
Acronyms	iii
Executive Summary	ES-1
Existing GHG Inventories and Climate Action Plans.....	ES-1
GHG Targets.....	ES-3
2045 Subregional Assessments.....	ES-5
GHG Emission Reduction Actions	ES-5
Summary of CCAP engagement.....	ES-5
CPRG Steering Committee	ES-6
Engagement with Municipalities and Stakeholder Agencies.....	ES-6
Public Engagement	ES-6
CCAP Elements/Document Organization.....	ES-6
Chapter 1.....	1-1
CPRG Overview	1-1
CPRG Purpose	1-1
MSA Background	1-1
Policy and Regulatory Background	1-5
Approach to Developing the CCAP.....	1-9
Existing Climate Action in the Region	1-10
Chapter 2.....	2-1
Greenhouse Gas Inventories, Projections, and Reduction Targets	2-1
CVAG	2-2
Unincorporated Riverside County	2-8
SBCOG	2-9
WRCOG.....	2-16
Entire Region (MSA).....	2-23
Chapter 3.....	3-1
GHG Reduction Measures	3-1
State Measures Summary.....	3-1
Energy-State-SB100: Renewables Portfolio Standard.....	3-2
Energy-State-SB350: SB 350 Clean Energy and Pollution Reduction Act	3-2
Energy-State-T24: Title 24 Standards for Non-Residential and Residential	
Buildings	3-2
AB 1470 (Huffman) Solar Water Heaters	3-3
Co-Generation Facilities	3-3
AB 1493 (Pavley I and II) Greenhouse Reductions from New Passenger	
Vehicles	3-4
SB 1383 Methane Capture.....	3-4
Recycling and Waste Diversion Mandates	3-5
Water Conservation Mandates.....	3-5
California Solar Mandate.....	3-6
Regional Measures Summary	3-7
Light Duty Electric Vehicle Infrastructure	3-7
Building Decarbonization	3-14
Goods Movement Decarbonization	3-20

CVAG Measures.....	3-25
Meeting GHG Reduction Targets	3-57
Unincorporated Riverside County Measures	3-61
Meeting GHG Reduction Targets	3-71
SBCOG Measures.....	3-72
Meeting GHG Reduction Targets	3-109
WRCOG Measures	3-111
Meeting GHG Reduction Targets	3-140
Chapter 4.....	4-1
Co-benefits Analysis.....	4-1
California Priority Populations for Climate Investments.....	4-1
Vulnerability Assessment	4-2
Co-Benefits to CCAP Measures	4-7
GHG Reduction Measure Co-Benefits Analysis	4-10
Chapter 5.....	5-1
Workforce Planning Analysis.....	5-1
Methods	5-1
Building Energy	5-1
On-Road Transportation	5-4
Off-Road Transportation.....	5-7
Solid Waste	5-8
Agriculture.....	5-9
Water and Wastewater	5-10
Chapter 6.....	6-1
References.....	6-1

Executive Summary

This Comprehensive Climate Action Plan (CCAP) serves as a detailed roadmap for reducing greenhouse gas (GHG) emissions across the Riverside-San Bernardino-Ontario metropolitan statistical area (MSA), which includes the Counties of Riverside and San Bernardino, California. The CCAP is intended to show pathways for meeting 2030 and 2045 GHG reduction targets and does not have the effect of law or a policy mandate. Three regional government organizations represent the city and county governments in the MSA for the purposes of the CCAP: Coachella Valley Association of Governments (CVAG), San Bernardino Council of Governments (SBCOG), and Western Riverside Council of Governments (WRCOG). The CCAP builds on the MSA's Priority Climate Action Plan (PCAP)¹ and 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 and other sub-regional government agencies, as well as local governments throughout the region. The lead organization for purposes of the Climate Pollution Reduction Grant (CPRG) Planning Grant Program is the San Bernardino County Transportation Authority (SBCTA)/San Bernardino Council of Governments (SBCOG).² Henceforth, it will be referred to as SBCOG.

Existing GHG Inventories and Climate Action Plans

Many local jurisdictions in California have aligned with the state's GHG targets (e.g., 2030 and 2045) by developing local GHG inventories and CAPs. The state's latest scoping plan (2022) for addressing greenhouse gas emissions 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.³ The California Air Resource Board (CARB) recommends that 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 includes 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. The County of Riverside completed a Climate Action Plan in 2015 with an update in 2019. More than 25 local CAPs have been completed in the region since 2010, including seven in the WRCOG subregion, eight in the SBCOG subregion, and ten in the CVAG subregion. The Subregional CAPs developed for the SBCOG and WRCOG subregions, in addition to the County of Riverside CAP, include emissions targets that align with the California goal of reducing emissions levels statewide to 40 percent below 1990 levels by 2030. Neither the SBCOG nor the WRCOG CAPs, however, provide emissions targets beyond 2030.

¹ SBCOG, 2024

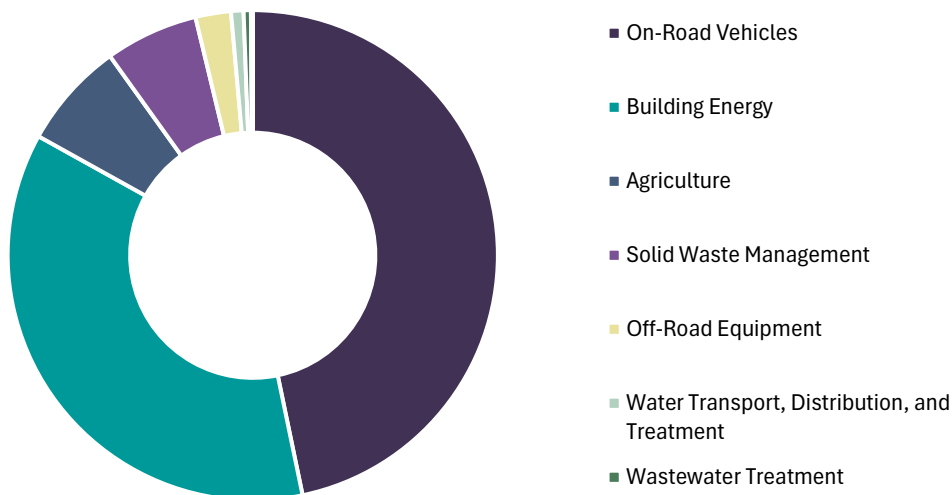
² SBCTA and SBCOG are a dual entity, with transportation being the focus of SBCTA. In 2016, the agency sponsored Senate Bill 1305 (Morrell), consolidating the County Transportation Commission, local transportation authority, service authority for freeway emergencies and local congestion management agency 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).

³ CARB, 2022a

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 CCAP. These subregional GHG inventories, along with the County of Riverside GHG inventory, are summarized below by sector in **Table ES - 1** and **Figure ES-1**, as well as an estimate of total emissions for the region in million metric tons of carbon dioxide equivalent (MTCO₂e).⁴ The totals by sector indicate that on-road transportation contributes the largest share of regional emissions, at 47 percent, followed by building energy (consumption of natural gas and electricity) at 36 percent, agriculture at 7 percent, solid waste disposed at landfills at 6 percent, mobile offroad equipment at 2 percent, and water and wastewater treatment at less than 1 percent each. WRCOG quantified emissions from commuter rail, which contributes less than one percent of total regional GHG emissions. Riverside County quantified aviation emissions for aircraft trips within Riverside County, which comprised less than 1 percent of total regional GHG emissions. 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 CCAP. The CCAP builds on the existing measures to establish a more cohesive, regional approach to reducing GHG emissions. The PCAP laid the groundwork for the CCAP and offered an initial list of local and regional measures for reducing emissions. The CCAP will utilize frameworks and plans from the PCAP while also building on them to advance long term climate action and sustainability across the MSA.

Figure ES-1 GHG Emissions by Sector for the Entire Region



⁴ For comparison purposes, the inventory summaries in ES-1 include the sectors that were included for all subregions. Please note that the subregional inventories were completed for different years, which may be suitable for high-level comparison purposes but do not include differences that may have occurred between those years (i.e., population change, economic impacts of pandemic, etc.).

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

Sector	CVAG (2023)	SBCOG (2016)	WRCOG (2017)	Unincorporated Riverside County (2017) ⁵	Region Total	% of Region total
On-Road Vehicles	1,550,113	8,223,640	3,862,079	1,766,784	15,402,616	46.74%
Building Energy	1,464,682	5,649,589	3,670,257	1,188,139	11,972,667	36.33%
Agriculture	1,405	559,685	85,846	1,670,954	2,317,890	7.03%
Solid Waste Management	250,020	1,074,629	493,433	204,365	2,022,447	6.14%
Off-Road Equipment	157,570	247,911	362,752	3,883	772,116	2.34%
Water Transport, Distribution, and Treatment	28,135	146,750	93,971	N/A	268,856	0.82%
Wastewater Treatment	15,343	70,039	28,477	44,606	158,465	0.48%
Aviation	N/A	N/A	N/A	26,786	26,786	0.08%
Commuter Rail	N/A	N/A	13,704	N/A	13,704	0.04%
Total	3,467,267	15,972,243	8,610,519	4,905,517	32,955,546	100.00%

Note: Totals may not add up due to rounding.

GHG Targets

GHG targets for 2030 were established for the individual cities that are incorporated in the MSA and for the unincorporated portions of Riverside County. The targets are not uniform and are either mass-based or as a unit per service population.⁶ GHG targets for 2045 were not established at a city-level. Rather, the 2045 GHG target was evaluated at subregional levels and at a regional level. In both target-years, the GHG targets are consistent with California-mandated statewide GHG targets. The targets are detailed in the respective subregional sections of Chapter 2 and the 2030 GHG targets for the subregions are summarized below in **Table ES - 2** through **Table ES - 5**.

Table ES - 2
CVAG Cities 2030 GHG Reduction Targets

Jurisdiction	GHGs in 2023 ^a	GHG Target in 2030 ^{ab}	GHGs in 2030 ^a	Forecasted to Meet Target?
Blythe *	76,649 MTCO ₂ e	53,413 MTCO ₂ e	47,747 MTCO ₂ e	Yes
Cathedral City *	4.37 MTCO ₂ e/SP	3.05 MTCO ₂ e/SP	3.04 MTCO ₂ e/SP	Yes
Coachella**	4.47 MTCO ₂ e/SP	5.13 MTCO ₂ e/SP	2.86 MTCO ₂ e/SP	Yes
Desert Hot Springs *	4.36 MTCO ₂ e/SP	3.04 MTCO ₂ e/SP	2.95 MTCO ₂ e/SP	Yes
Indian Wells *	13.72 MTCO ₂ e/SP	9.56 MTCO ₂ e/SP	9.44 MTCO ₂ e/SP	Yes
Indio**	5.33 MTCO ₂ e/SP	4.20 MTCO ₂ e/SP	3.28 MTCO ₂ e/SP	Yes
La Quinta**	384,583 MTCO ₂ e	359,538 MTCO ₂ e	263,965 MTCO ₂ e	Yes
Palm Desert *	7.56 MTCO ₂ e/SP	5.27 MTCO ₂ e/SP	5.14 MTCO ₂ e/SP	Yes
Palm Springs** ^c	574,219 MTCO ₂ e	297,430 MTCO ₂ e	427,601 MTCO ₂ e	No
Rancho Mirage *	10.32 MTCO ₂ e/SP	7.19 MTCO ₂ e/SP	6.95 MTCO ₂ e/SP	Yes

NOTE:

a – GHG calculations are based on socioeconomic data from Department of Finance or Riverside County as described in Chapter 1.

b – GHG targets were selected by the individual cities; some were established prior to the PCAP/CCAP work, some were identified in this work.

c – Under this analysis, Palm Springs is not currently forecasted to meet its GHG reduction goal of 40% below 1990 levels by 2030, which equates to 297,430 MTCO₂e, based on the City's 2021 Climate Action Roadmap. Achieving this goal based on the most recent GHG inventory (2023) would require a 52 percent reduction in total emissions.

* Based on DOF socioeconomic data.

**Based on RIVCOM socioeconomic data.

⁵ County of Riverside, 2019

⁶ “Service population” or “SP” is defined as the number of jobs plus the number of residents. Targets using the SP are in terms of GHG emissions divided by the SP.

Table ES - 3
Unincorporated Riverside County GHG Emissions Reduction Targets

GHG Targets	2020	2030	2045 ^a
State-Aligned Target (% change from 1990)	0	-40%	-85%
State-Aligned Target (% change from 2008)	-15%	-49%	-86% ^b
State-Aligned Target (MTCO ₂ e)	5,960,997	3,576,598	981,811
Forecasted to Meet Target?	Yes	No	No
NOTES: a – Interpolated based on the Riverside County CAP calculations through 2050 b – Calculated based on State GHG inventory data for 2008 and AB 1279 GHG target for 2045. Specifically, California GHG inventory for 1990 is 431 MMTCO ₂ e and 478.8 MMTCO ₂ e for 2008. The 2008 GHG emissions would need to be reduced by 86 percent to achieve the AB 1279 GHG target of 64.65 MMTCO ₂ e.			

Table ES - 4
SBCOG Jurisdictions' Emissions Reductions Targets

Jurisdiction	Baseline Level	Planned 2030 Reductions (MTCO ₂ e)	Forecasted to Meet Target with Plan?
Adelanto	2020 BAU	40%	Yes
Apple Valley	2005	40%	Yes
Barstow	2020 BAU	40%	Yes
Big Bear Lake	2008	32%	Yes
Chino	2008	46%	Yes
Chino Hills	2008	35.1%	Yes
Colton	2008	46%	Yes
Fontana	2008	46%	Yes
Grand Terrace	2020 BAU	42%	Yes
Hesperia	2020 BAU	40%	Yes
Highland	2016	40%	Yes
Loma Linda	2008	25%	Yes
Montclair	2016	42%	Yes
Needles	2020 BAU	35.9%	Yes
Ontario	2016	40%	Yes
Rancho Cucamonga	2016	40%	Yes
Redlands	2008	35.1%	Yes
Rialto	2016	40%	Yes
San Bernardino	2016	40%	Yes
Twentynine Palms	2008	46%	Yes
Upland	2016	40%	Yes
Victorville	2008	40%	Yes
Yucaipa	2008	46%	Yes
Yucca Valley	2020 BAU	40%	Yes
Unincorporated San Bernardino County	2020 BAU	40%	Yes
SOURCE: San Bernardino County Greenhouse Gas Reduction Plan (2021)			

Table ES - 5
WRCOG Cities: GHG Reductions Needed from Local Measures to Achieve 2030 Target Based on Service Population Metric

Local Measures by Sector		2030 Regional Performance Goal	2030 Reduction Potential (MTCO ₂ e/year)
Energy			
LE-1	Expand Local Renewable Energy Production	10% of total electricity demand generated by local solar PV systems	182,303
LE-2	Community Choice/Utility Renewable Electricity	75% of the population purchases 100% renewable electricity	246,109 ^a
LE-3	Improve Energy Efficiency of Existing Buildings	10% of existing buildings undertake measures to reduce energy use by 25%	79,374
LE-4	Building & Appliance Electrification	Reduce natural gas use in existing buildings by 15%	3,788
Transportation			

Table ES - 5 WRCOG Cities: GHG Reductions Needed from Local Measures to Achieve 2030 Target Based on Service Population Metric			
Local Measures by Sector		2030 Regional Performance Goal	2030 Reduction Potential (MTCO ₂ e/year)
LT-10	Expand ZEV Infrastructure and Support ZEV Purchases	Increase ZEV adoption by 10% over California's statewide fleet mandates	231,028
Total Local Reductions Anticipated^b			742,602
Total Local Reductions Needed (from Table 3-38)			735,676
Forecasted to Meet Target?			Yes
NOTE:			
a – Reductions from LE-1 (local solar PV) accounted for prior to quantification of LE-2 (i.e., avoids double counting).			
b – Totals may not add up due to rounding.			

2045 Subregional Assessments

Achieving a 2045 GHG reduction target consistent with AB 1279 will require substantial reductions from a combination of state, regional, and local measures. Each subregion modeled the potential GHG reductions from the actions identified in this CCAP and its impact on making progress toward a state-aligned 2045 target. To achieve this target as a region, key strategies include a region-wide commitment to 100 percent renewable electricity and building energy efficiency upgrades. In addition, the electrification of buildings and transportation will be particularly important to achieving a state-aligned 2045 target. Each subregion discusses the effort required to meet its 2045 target, and WRCOG provides a city-specific analysis. Many of these measures are consistent with state policy direction and discussed in CARB's 2022 Climate Change Scoping Plan Update.

GHG Emission Reduction Actions

GHG emission reduction actions include those from the state of California, regional measures applied across the MSA, subregional measures identified by SBCTA/SBCOG, WRCOG, CVAG, unincorporated Riverside County, and local measures identified by local jurisdictions. Local GHG emissions reduction actions were selected through review of existing climate action plans in the MSA, coordination with local jurisdictions, and development of new local measures in partnership with local jurisdictions. In addition, some actions were identified through stakeholder engagement and surveying where individual cities did not have existing climate action plans. These actions and their quantification are summarized in the respective subregional sections of Chapter 3 below.

Summary of CCAP engagement

The focus of the CCAP engagement process was directed towards forging connections with, and gaining feedback from, key stakeholders in San Bernardino and Riverside counties through targeted channels.

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

communities that could be integrated into the CCAP. Engagement activities during CCAP development included a public survey published in English and Spanish, participation in municipal meetings and agency committees throughout the region, events with city staff and elected officials, and one-on-one meetings with stakeholders. Much of the CCAP engagement was informed by the PCAP engagement, which included a Steering Committee, and municipalities and stakeholder agencies.

CPRG Steering Committee

- The CPRG 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 and CCAP.

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 for the PCAP. Engagement activities included informational presentations, discussion groups, stakeholder sessions, one-on-one meetings, and in-person convenings and were used to inform the CCAP.
- CVAG held monthly CCAP meetings with its jurisdiction members and facilitated information gathering and feedback from local government staff. Engagement activities included informational presentations, one-on-one meetings, write-in feedback, and GHG reduction measure selection.

Public Engagement

- CVAG published a public survey in English and Spanish to gauge the priorities of residents living in CVAG member jurisdictions. CVAG jurisdictions helped to promote the survey, which received over 670 responses. The responses to the surveys helped jurisdictions to make informed decisions about GHG reduction measure selection.

CCAP Elements/Document Organization

The CCAP is organized into six chapters and six appendices that provide additional detail on topics covered in the CCAP. A summary of each component of the CCAP is presented below.

Chapter 1 – CPRG Overview. 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 CCAP and the overall Climate Pollution Reduction Grant (CPRG) project, describes the current policy and regulatory setting, and provides a brief overview of the existing CAPs within the CVAG, SBCOG, and WRCOG subregions.

Chapter 2 – Greenhouse Gas Inventories, Projections, and Reduction Targets. This chapter presents a summary of the most recent GHG inventories developed by each subregion in the Riverside–San Bernardino–Ontario MSA, including a new baseline GHG inventory for CVAG, which did not have recent uniform updated inventories for the different jurisdictions. It also contains the GHG emissions projections for each subregion for 2030 and 2045, and summarizes GHG reduction targets.

Chapter 3 – GHG Reduction Measures. This chapter presents the 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 categorized by state and local actions. This chapter also includes a discussion of how the jurisdictions will meet the GHG targets and what additional GHG emissions reductions actions could be explored.

Chapter 4 – Co-Benefits Analysis. This chapter identifies areas across the MSA that are disproportionately affected by multiple pollution sources and sensitive population characteristics and emphasizes the importance of investing in projects that benefit these priority populations to reduce GHG emissions while providing environmental, economic, and public health co-benefits.

Chapter 5 – Workforce Planning Analysis. This chapter presents an analysis of anticipated workforce shortages that could prevent the MSA from achieving the GHG reduction targets and related measures. It also identifies potential solutions and key partners at the state, regional, and local levels needed to address those challenges.

Chapter 6 – References.

Appendix A – CVAG Local Profiles. This appendix contains the city profiles for the participating CVAG jurisdictions. City profiles contain individual jurisdictions’ GHG inventories, projections, and GHG reduction targets. In addition, they list the various measures that each jurisdiction selected and the overall GHG reduction potential.

Appendix B – WRCOG Local GHG Reduction Measures. This appendix includes tables of GHG reduction measures found in 7 existing local Climate Action Plans in the WRCOG region developed by the cities of Beaumont, Corona, Lake Elsinore, Murrieta, Moreno Valley, and Riverside, as well as the County of Riverside.

Appendix C – 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 CCAP’s priority regional measures.

Appendix D – Authority to Implement and Intersection with Other Funding Availability. This appendix provides a review of authority for the primary supporting agencies responsible for implementing the GHG reduction measures within the MSA. It also provides a summary of funding available to pursue objectives of the CCAP.

Appendix E – Workforce Development Programs. This appendix provides information on the various existing workforce development programs in the region.

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

Chapter 1

CPRG Overview

CPRG 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 GHG emissions and associated criteria and toxic air pollution by deploying new technologies, operational efficiencies, and solutions that will transition America to a low-carbon economy justly. The first phase of the CPRG program was the development of a Priority Climate Action Plan (PCAP)⁷, which serves as a high-level planning exercise for reducing GHG emissions at the local and regional scales. The second phase of the CPRG program is to develop a Comprehensive Climate Action Plan (CCAP), which builds on the PCAP and provides a more in-depth analysis of the region's GHG emissions and addresses all major sources and sinks of GHG emissions and establishes short- and long-term emission reduction goals, strategies, and measures. This document is the CCAP 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 CCAP is to establish a comprehensive pathway for reducing GHG emissions throughout the region. As such, the CCAP includes a detailed list of regional and local GHG reduction measures and evaluates the GHG emissions reduction that would be achieved through the implementation of these measures. The CCAP identifies emission reduction measures in the transportation and energy sectors, which are the biggest contributors to regional GHG emissions. There are additional GHG reduction measures for the water, wastewater, solid waste, and agricultural sectors. In addition, the CCAP provides a benefits analysis for the GHG reduction measures, including co-benefits such as jobs creation, economic development, health outcomes, and more, as well as a workforce planning analysis. Finally, this CCAP establishes regional GHG reduction targets across the MSA for 2030 and 2045, aligned with California's statewide targets.

MSA Background

The Riverside-San Bernardino-Ontario MSA is faced with climate and air quality challenges due to economic activity, population density, topography and weather patterns, as well as persistent economic and social disparities. 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 priority populations, with disproportionate impacts related to climate change, air pollution, and hazardous air pollutants (HAPs). Priority populations include communities that have historically experienced significant environmental, economic, health, or social burdens due to underinvestment, exclusion from decision-making processes, or exposure to environmental hazards. These populations are generally identified based on factors such as income levels, health outcomes, environmental exposures, and access to

⁷ SBCOG, 2024

essential services. Addressing the needs of these priority populations can help ensure that all residents benefit from the transition to a low-carbon economy.

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 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.

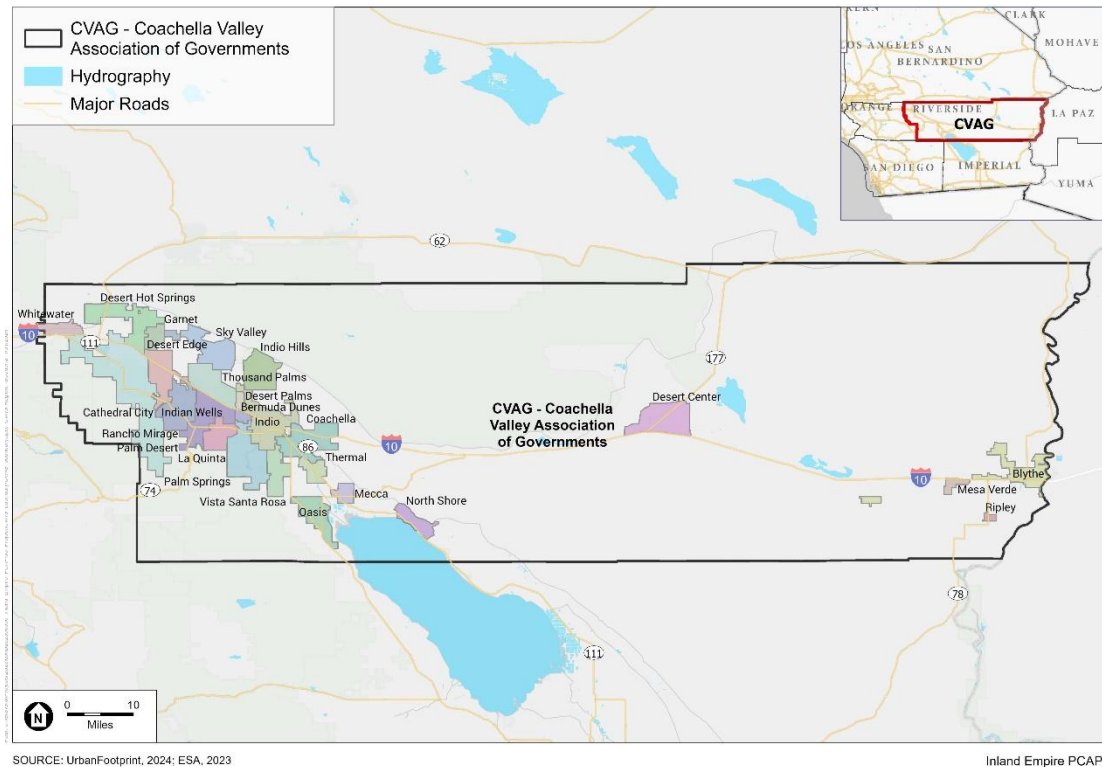
This MSA is also intrinsically linked to the Los Angeles–Long Beach–Anaheim and Oxnard–Thousand Oaks–Ventura MSAs, which together represent the jurisdiction of the Southern California Association of Governments (SCAG). The SCAG region's GDP is \$1.6 trillion and would have been the 15th largest economy in the world in 2021 if considered its own country. 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.

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

Coachella Valley Association of Governments (CVAG)

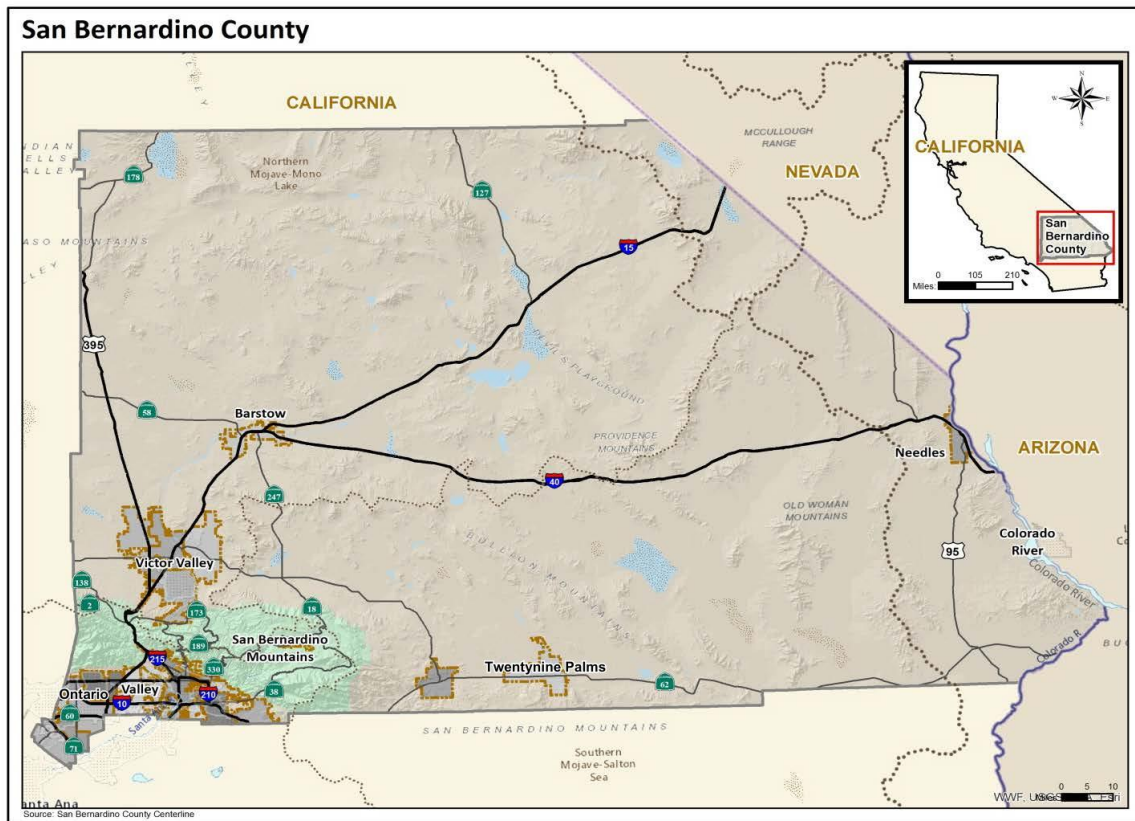
The CVAG subregion represents Central and Eastern Riverside County, the area known as the Coachella Valley (see **Figure 1-1**). CVAG supports an enhanced quality of life and balanced growth for residents in this area by coordinating efforts and providing solutions to the collective issues that face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

CVAG is 5,275 square miles, consists of ten cities, Riverside County, the Agua Caliente Band of Cahuilla Indians, Cabazon Band of Mission Indians, Torres Martinez Desert Cahuilla Indians, and Twenty-Nine Palms 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 1-1 CVAG Subregion

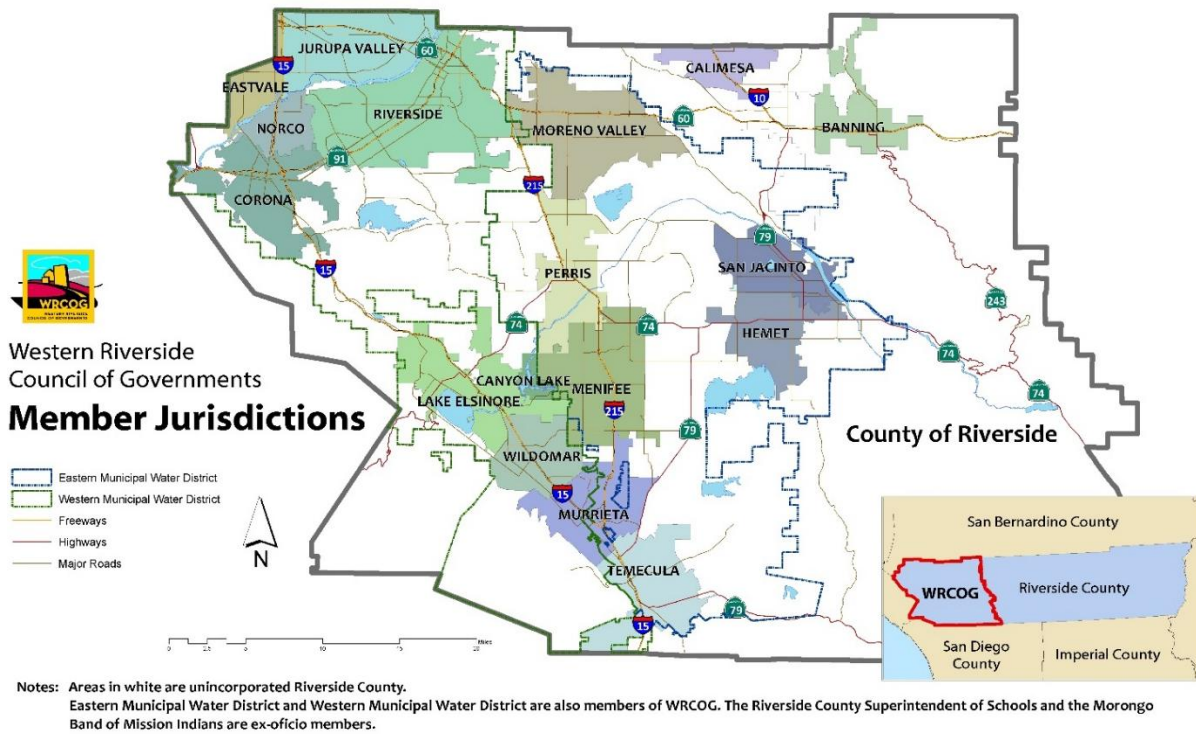
San Bernardino Council of Governments (SBCOG)

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 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).

Figure 1-2 SBCOG Subregion

Western Riverside Council of Governments (WRCOG)

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. WRCOG has a strong legacy of collaboration among its member agencies (see **Figure 1-3**) and innovation in implementing programs that are environmentally, economically, and socially beneficial to the subregion.

Figure 1-3 WRCOG Subregion

Policy and Regulatory Background

National

Federal and state laws enable and inform local actions. As such, the CCAP 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. Updated periodically over time. In 2025, EPA has proposed repealing GHG 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.
Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants	2024	Established GHG emissions standards for the power sector under the Clean Air Act. On June 11, 2025, EPA proposed to repeal all GHG emissions standards for the power sector under Section 111 of the Clean Air Act.

According to the EPA, transportation emissions have accounted for the largest portion of United States (US) GHG emissions in recent years.⁸ Federal climate change regulation to date has included a focus 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 as well as regulations for the power generation sector. The 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, and the power sector regulations have also been under the CAA authority. Federal regulations on GHG emissions have changed periodically with the changing priorities of different administrations and also due to the results of Congressional Action and court rulings.

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 which was later updated through Senate Bill (SB) 32 and Assembly Bill (AB) 1279. Combined, these laws authorize 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, 40 percent below 1990 levels by 2030, and reduction of anthropogenic levels to 85 percent below 1990 levels by 2045 and net zero emissions by 2045 (including sequestration in natural and working lands and potential mechanical carbon removal). 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.
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% 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 heavy-duty vehicles in the state be zero-emission by 2045 and by 2035 for drayage trucks.
Mobile Source Strategy	2020	Described the strategy for transitioning to zero-emission vehicles, or ZEVs, with a goal of 100 of California-registered medium- and heavy-duty trucks to be ZEVs by

⁸ USEPA, 2023

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

Legislation / Regulation	Year	Description
		2045 where feasible, 100 percent zero-emission off-road equipment by 2035, and all new passenger cars and trucks sold in California be zero-emission by 2035.
Advanced Clean Cars I/II (ACC I/II)	2022	Requires that by 2035 all new passenger cars, trucks, and SUVs sold in California will be 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% electrification by 2035. There is an active challenge to the waivers that set these standards as of July 2025, so please refer to CARB's Current Litigation website (https://ww2.arb.ca.gov/current-litigation) for the most up to date information.
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% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% 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. CARB withdrew its request for a federal waiver and authorization for the ACF regulation. As such, CARB is not enforcing portions of the ACF regulation that require federal approval.
Energy		
SB 1078	2002	Required that 20% 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% Renewables Portfolio Standard, or RPS, by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires that 65% 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% 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, 2045. The law establishes an interim target of 40% 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% in 2035 and 95% in 2040. It accelerates the timeline required to have 100% 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% 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,

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

Legislation / Regulation	Year	Description
		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% 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%, HFC gases by 40%, and anthropogenic black carbon by 50% 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% 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.
SB 535, Greenhouse Gas Reduction Fund and Disadvantaged Communities	2012	Required that 25% 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% of these be spent on projects located in disadvantaged communities.
EO B-30-15	2015	Established a GHG emissions reduction target of 40% 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% 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; CO₂ = 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.

Approach to Developing the CCAP

The CCAP was a collaborative effort led by SBCOG in partnership with WRCOG, CVAG, and their respective jurisdictions. As previously stated, the CCAP builds from the foundations established in the PCAP, which was submitted to the EPA in March 2024. The CCAP process kicked off officially in April 2024 and will end in 2025 with the submission of the CCAP to the EPA. Because SBCOG and WRCOG have already undertaken comprehensive subregional climate planning efforts and set GHG reduction targets, the work for this CCAP focused primarily on developing a subregional GHG inventory and projections as well as GHG reduction measures for CVAG and extending consideration of the prior SBCOG and WRCOG plans to 2045. CVAG worked closely with participating jurisdictions, which includes Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, and Rancho Mirage, throughout the CCAP’s development. The jurisdictions’ participation and input were integral for the GHG inventories, selecting GHG reduction measures, and conducting community outreach. **Table 1-3** below describes the key activities and timeline for developing the CCAP.

Table 1-3 Approach to Developing the CCAP			
Activity	Timeline	Description	CCAP Section
Meaningful Engagement			
Stakeholder Engagement Plan	April 2024	Developed a stakeholder engagement plan to ensure meaningful engagement throughout the CCAP development process. The plan included strategies to conduct community outreach and building a collaborative approach for integrating stakeholder feedback.	Appendix F
CVAG jurisdiction engagement	June 2024 – December 2025	Met with CVAG jurisdictions monthly to provide updates on CCAP progress, discuss data needs, and provide a platform for jurisdictions to provide input and feedback on the CCAP.	Appendix F
GHG Emissions Community Survey	June 2024 – March 2025	Developed a survey to gauge community priorities and concerns to inform GHG reduction measures. Published an English and Spanish version of the survey.	Appendix F
GHG Inventory, Projections, and Reduction Targets			
GHG Inventory	September 2024 – December 2024	Estimated GHG emissions at the jurisdictional and subregional level for building energy, transportation, agriculture, waste, water and wastewater, and natural and working lands aligned with the U.S. Community GHG Protocol.	Chapter 2
BAU Projections	December 2024 – February 2025	Developed business-as-usual projections for CVAG cities for 2030 and 2045 based on key socioeconomic data, such as population and employment growth.	Chapter 2
GHG Reduction Targets	March 2025 – May 2025	Established 2030 GHG reduction targets for CVAG jurisdictions aligned with California regulatory requirements and established an MSA-wide 2045 target.	Chapter 2
GHG Reduction Measures			
Measure Development and Selection	July 2024 – April 2025	Based on CVAG jurisdictions’ previous climate action plans and general plans, CVAG developed a list of preliminary measures for jurisdictions to self-select to be included for modeling.	Chapter 3

Table 1-3
Approach to Developing the CCAP

Activity	Timeline	Description	CCAP Section
GHG Reduction Measure Quantification	January 2025 – April 2025	Established key assumptions for GHG reduction measures and completed modeling for CVAG jurisdictions.	Chapter 3
Benefits Analysis			
Priority Population Identification	February 2025 – June 2025	Identified priority populations within the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA) using CalEPA's criteria for pollution-burdened and low-income communities.	Chapter 4
Co-benefits Analysis	February 2025 – June 2025	Quantified air quality co-pollutant reductions for each category of measure in the CCAP.	Chapter 4
Workforce Planning	March 2025 – June 2025	Analysis of anticipated workforce shortages or surpluses from the GHG reduction measures, and identification of potential solutions and key partners at the state, regional, and local levels needed to address those challenges.	Chapter 5

Existing Climate Action in the Region

This CCAP incorporates and builds upon much of the previous climate action planning undertaken by each subregion within the Riverside-San Bernardino-Ontario MSA. WRCOG and SBCOG have both conducted subregional climate planning efforts. In WRCOG, every jurisdiction has engaged at some point in climate action planning at the local or subregional scale, or in some cases both. All of the SBCOG member jurisdictions participated in its 2021 Regional GHG Reduction Plan and some members have independently developed local CAPs.⁹ This CCAP represents CVAG's first subregional climate planning initiative, although all of its members have individually developed CAPs in the past. For a comprehensive understanding of the MSA's previous climate action planning efforts, please see Chapter 2 of the PCAP.

⁹ SBCOG, 2021

Chapter 2

Greenhouse Gas Inventories, Projections, and Reduction Targets

This chapter includes a summary of the GHG baseline inventories for CVAG, Unincorporated Riverside County, SBCOG, and WRCOG. A GHG inventory identifies and measures the sources of all GHG emissions and sinks within a selected physical and/or economic boundary. It also includes GHG projections through 2030 and 2045, and GHG reduction targets.

Principal Greenhouse Gases

Carbon Dioxide

Carbon dioxide (CO₂) is the most abundant anthropogenic GHG, accounting for more than 75% of all GHG emissions caused by humans. The primary sources of anthropogenic CO₂ in the atmosphere include the burning of fossil fuels, gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO₂ can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria). Atmospheric CO₂ has increased from a pre-industrial concentration of 280 parts per million (ppm) to 405 ppm in 2017 (National Oceanic and Atmospheric Administration, 2020a).

Methane

Methane (CH₄), the main component of natural gas, is the second most abundant GHG and has a GWP of 28—that is to say that one kilogram of CH₄ has the same warming effect as 28 kilograms of CO₂ (Intergovernmental Panel on Climate Change, 2013). Sources of anthropogenic emissions of CH₄ include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal. Certain land uses also function as both a source and sink for CH₄. For example, the primary terrestrial source of CH₄ is wetland areas, whereas undisturbed, aerobic soils act as a CH₄ sink (i.e., they remove CH₄ from the atmosphere). Atmospheric CH₄ has increased from a preindustrial concentration of 715 parts per billion (ppb) to 1,850 ppb in 2017 (National Oceanic and Atmospheric Administration, 2020b).

Nitrous Oxide

Nitrous oxide (N₂O) is a powerful GHG, with a GWP of 265 (Intergovernmental Panel on Climate Change, 2013). Anthropogenic sources of N₂O include agricultural processes (e.g., fertilizer application), nylon production, combustion of fossil fuel by power plants, nitric acid production, and vehicle emissions. N₂O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N₂O, which can be released to the atmosphere by diffusion. In the United States, more than 70% of N₂O emissions are related to agricultural soil management practices, particularly fertilizer application. Atmospheric N₂O concentrations have increased from a preindustrial concentration of 270 ppb to 330 ppb in 2017 (National Oceanic and Atmospheric Administration, 2020c).

Perfluorocarbons

The most abundant perfluorocarbons (PFCs) are CF₄ (PFC-14) and C₂F₆ (PFC-116). These human-made chemicals are emitted largely from aluminum production and semiconductor manufacturing processes.

PFCs are extremely stable compounds that are destroyed only by very high-energy ultraviolet rays; hence, PFCs have very long lifetimes. They also have high GWPs, ranging from 6,630 for CF₄ to 11,100 for C₂F₆ (Intergovernmental Panel on Climate Change, 2013). PFCs are incredibly powerful GHGs due to the combination of very high GWPs and very long lifetimes.

Sulfur Hexafluoride

Sulfur hexafluoride (SF₆) is a human-made chemical used in the magnesium industry, semiconductor manufacturing, as an electrical insulating fluid for power distribution equipment, and as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency, 2006). In 2017, atmospheric concentrations of SF₆ were 9.3 parts per trillion (ppt) and steadily increasing (National Oceanic and Atmospheric Administration, 2020d). SF₆ is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,500 (Intergovernmental Panel on Climate Change, 2013).

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs ranging from 140 to 11,700 (U.S. Environmental Protection Agency, 2006). HFCs are generally used as substitutes for ozone-depleting substances (ODS) in automobile air conditioners and refrigerants. The most abundant HFCs, in descending order, are HFC-134a, HFC-23, and HFC-152a.

CVAG

CVAG Greenhouse Gas Emissions Inventories

The CVAG subregional inventory includes the GHG emissions from activities taking place throughout the community by residents, businesses, and local governments. The inventory creates an emissions benchmark for each jurisdiction, which allows cities to set emission reduction targets to measure future progress. This subregional inventory conducted for CVAG provides an understanding of where GHG emissions originate and helps jurisdictions develop effective measures to reduce emissions. CVAG's first GHG inventory was first conducted in 2011 with a baseline year of 2005. This inventory is the first update since then and establishes 2023 as the new baseline year.

The GHG inventory encompasses the GHG emissions resulting from activities taking place within each jurisdiction's boundaries and where the local government has jurisdictional authority. The GHG inventory for the unincorporated portion of the county were estimated in 2019 separately by Riverside County are summarized in a later section of this chapter.¹⁰ Emissions were included in a jurisdiction's inventory if either the emission source 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). Carbon sinks are included as an informational line item, but are not included in the accounting to decrease the subregion's overall GHG emissions. 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.

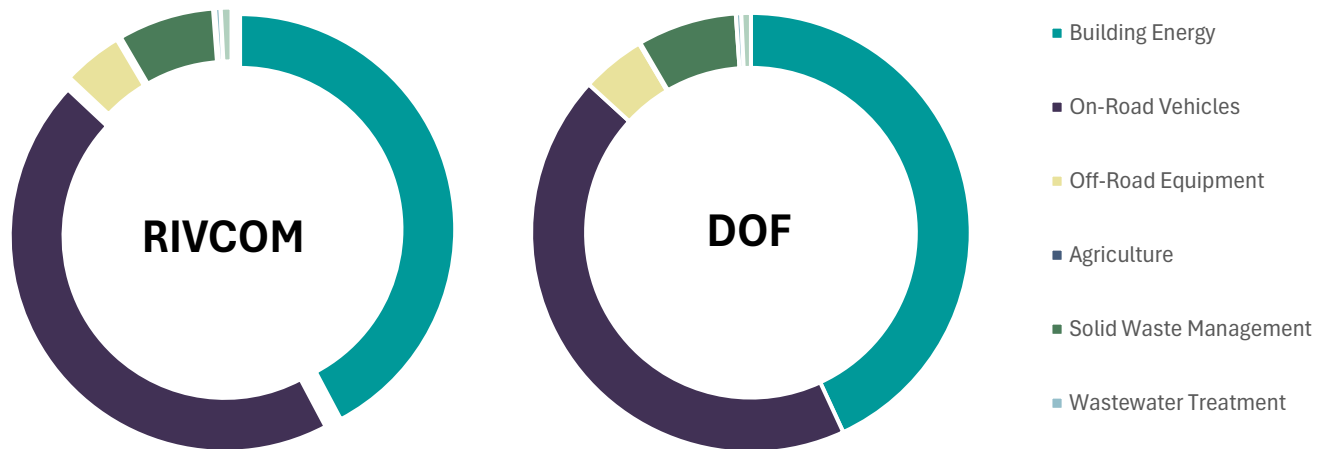
Inputs to the GHG inventory included activity data, such as energy consumption data from local utilities, along with socioeconomic data. Two scenarios were developed using socioeconomic data from the

¹⁰ County of Riverside, 2019

Riverside County Model (RIVCOM)¹¹ and from the California Department of Finance (DOF).¹² The RIVCOM data has been vetted through regional processes and includes pre-pandemic socioeconomic data using assumptions consistent with SCAG's regional growth projections and input from local jurisdictions. The RIVCOM data was extrapolated to 2030 and 2045. The DOF data reflects 2023 socioeconomic data that's based on DOF's Housing Unit Survey; 2030 and 2045 information has been extrapolated based on 2023 base year data.

Total emissions for all CVAG jurisdictions in 2023 amounted to 3,467,267 MTCO₂e and 3,410,566 MTCO₂e under the RIVCOM and DOF scenarios, respectively. Building energy and transportation were the largest sources of emissions, 42 and 45 percent of total emissions under the RIVCOM scenario and 43 and 44 percent under the DOF scenario respectively, depicted in **Figure 2-1**. **Table 2-1** summarizes the main emissions sources and the results of the 2023 inventory, and **Figure 2-2** depicts the 2023 inventory results graphically by jurisdiction.

Figure 2-1 RIVCOM (left side) and DOF (right side) Emissions (MTCO₂e) Compared



Sector	RIVCOM		DOF	
	Emissions	Percent	Emissions	Percent
Building Energy	1,464,682	42.2%	1,468,774	43.1%
On-Road Vehicles	1,550,113	44.7%	1,491,782	43.7%
Off-Road Equipment	157,570	4.5%	159,201	4.7%
Agriculture	1,405	<0.1%	1,405	<0.1%
Solid Waste Management	250,020	7.2%	250,020	7.3%
Wastewater Treatment	15,343	0.4%	13,843	0.4%
Water Transport, Distribution, and Treatment	28,135	0.8%	25,542	0.7%
Total Emissions	3,467,267	100%	3,410,566	100%

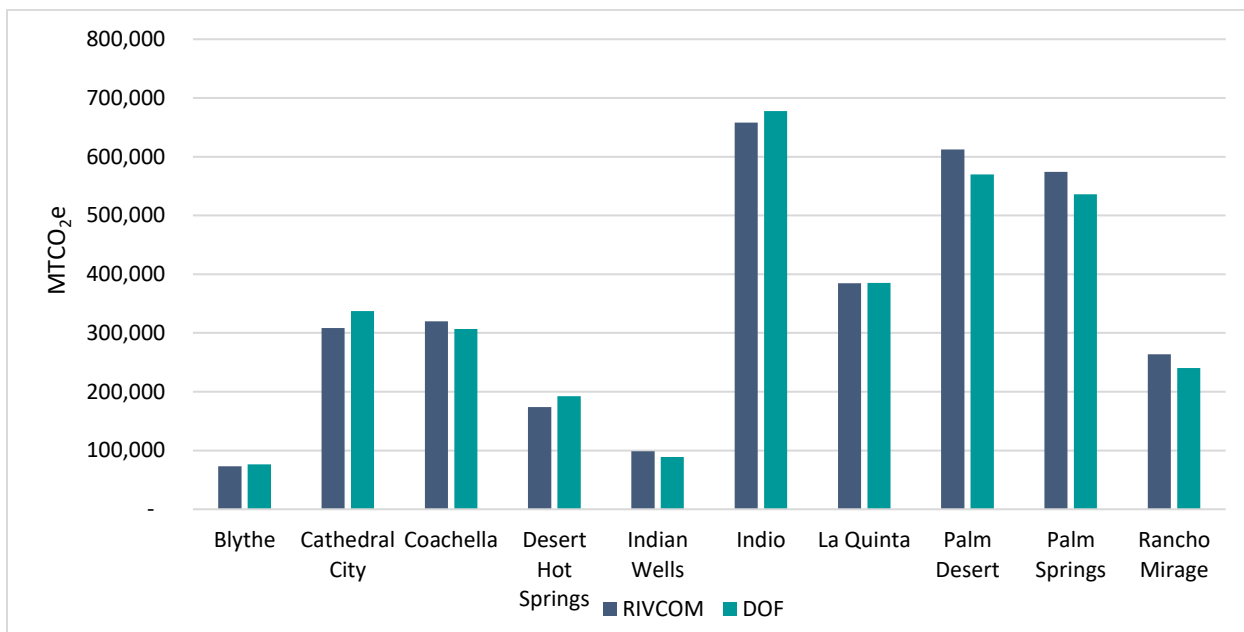
¹¹ WRCOG, n.d.

¹² DOF, n.d.

Table 2-1
CVAG 2023 GHG Emissions (MTCO₂e)

Sector	RIVCOM		DOF	
	Emissions	Percent	Emissions	Percent
Stationary Sources ^b	736,643		736,643	
Carbon Sinks				
Natural and Working Lands	1,283,392		1,283,392	
NOTES:				
a – Totals may not add up due to rounding				
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. This data was taken from the California Air Resources Board (CARB) Annual Summary of GHG Mandatory Reporting Non-Confidential Data				

Figure 2-2 **2023 Baseline GHG Emissions for CVAG’s 10 Partnership Jurisdictions by jurisdiction (MTCO₂e)**



CVAG Emissions Forecast

Forecasts of future emissions in the CVAG subregion were developed for the years 2030 and 2045 under “business-as-usual” (BAU) conditions. BAU scenarios assume that there are no state, regional, or local actions that will reduce emissions over time. If the CVAG subregion was to continue historic trends of activities such as energy consumption, vehicular travel, water consumption, agriculture, and waste/wastewater generation and disposal, the resulting emissions from these activities would lead to the resulting BAU emissions forecasts. The forecasts were developed under two scenarios using estimates for population, household, and employment growth within each participating city corresponding to socioeconomic data from RIVCOM and DOF. Socioeconomic data used for this analysis are summarized in **Table 2-2** below.

Table 2-2 CVAG Cities – Socioeconomic Data and Forecasts						
Metric	RIVCOM			DOF		
	2023	2030	2045	2023	2030	2045
Population	431,847	492,746	623,240	389,635	405,859	453,995
Households	161,157	187,461	243,824	205,128	227,761	263,590
Employment	181,284	198,896	236,631	176,400	190,676	221,265
Service Population ^a	613,131	691,642	859,871	566,035	596,535	675,260
NOTES: a – Service population = population + employment.						

Table 2-3 presents community BAU emissions forecasts by sector for 2030 and 2045, for the CVAG cities, under both RIVCOM and DOF scenarios. Transportation and building energy are expected to contribute large shares of emissions through 2045. Under BAU conditions, the relative contributions from each sector are expected to be similar in 2030 and 2045 under both scenarios. Overall, BAU emissions are expected to increase under the RIVCOM and DOF scenarios respectively by approximately 10 percent and 5 percent from 2023 to 2030, and approximately 32 percent and 20 percent from 2023 to 2045.

Figure 2-3 and **Figure 2-4** depict the BAU forecast of community emissions by sector for the years 2030 and 2045.

Table 2-3 BAU Emissions Forecast by Sector for CVAG Cities (MTCO _{2e})								
Sector	RIVCOM				DOF			
	2030 BAU	% of Total	2045 BAU	% of Total	2030 BAU	% of Total	2045 BAU	% of Total
On-Road Transportation	1,690,843	44.2%	1,992,412	43.4%	1,546,698	43.0%	1,763,813	43.0%
Building Energy	1,635,545	42.7%	2,004,362	43.6%	1,571,489	43.7%	1,778,371	43.3%
Solid Waste	277,480	7.2%	332,123	7.2%	259,193	7.2%	294,479	7.2%
Off-Road Equipment	171,948	4.5%	202,781	4.4%	173,277	4.8%	216,145	5.3%
Agriculture	1,920	0.1%	2,162	0.0%	1,920	0.1%	2,162	0.1%
Water	31,010	0.8%	37,171	0.8%	26,337	0.7%	29,639	0.7%
Wastewater	19,361	0.5%	24,488	0.5%	15,947	0.4%	18,642	0.5%
Total Emissions	3,828,106	100%	4,595,499	100%	3,594,861	100%	4,103,250	100.0%
Note: Totals may not add up due to rounding.								

Figure 2-3 CVAG Subregion: Business-As-Usual GHG Emissions Forecast by Sector (MTCO₂e) – All Cities Combined (RIVCOM)

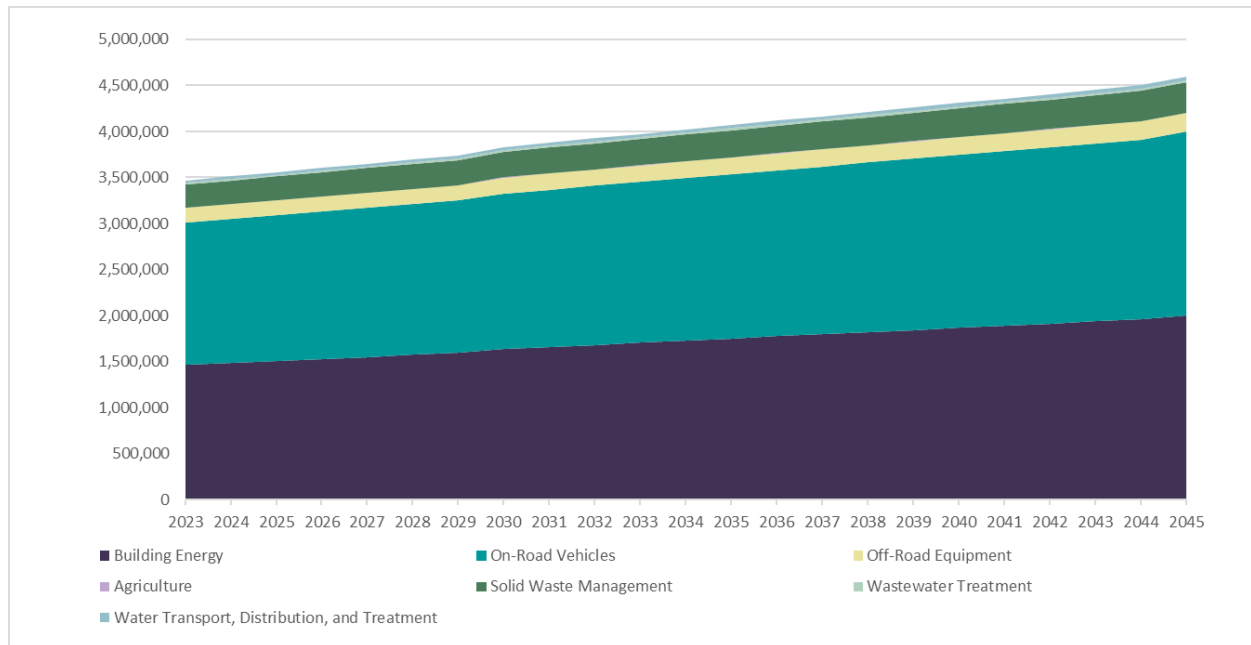
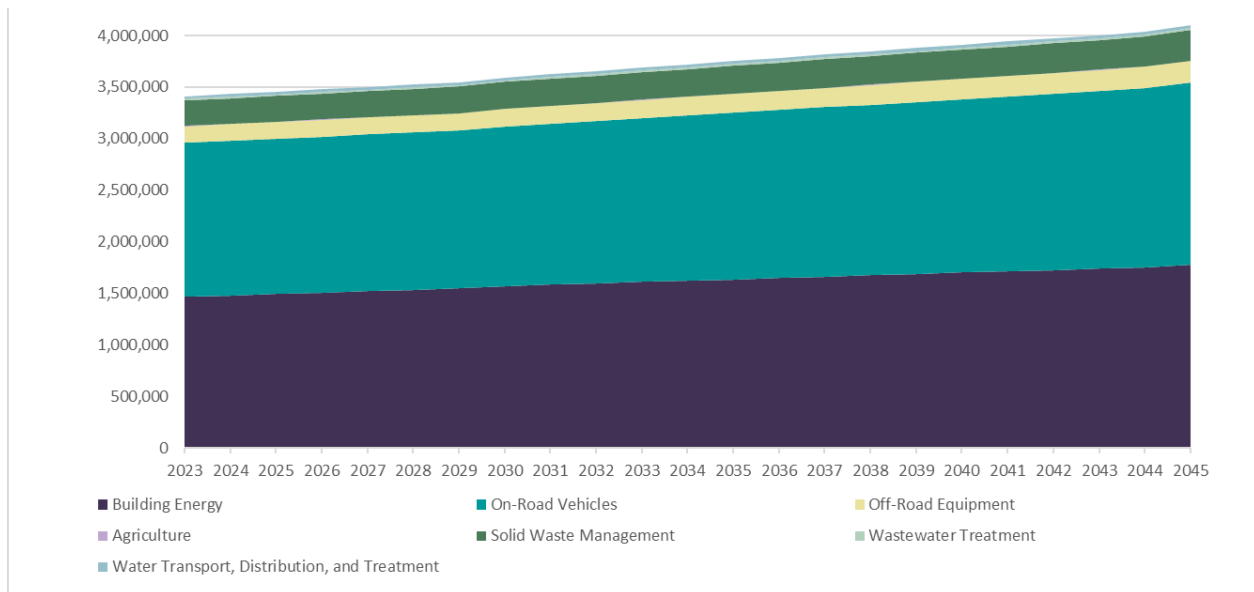


Figure 2-4. CVAG Subregion: Business-As-Usual GHG Emissions Forecast by Sector (MTCO₂e) – All Cities Combined (DOF)



CVAG Emission Reduction Targets

2030 Targets

California's SB 32 mandates a statewide reduction in GHG emissions of 40 percent below 1990 levels by 2030. From 1990 to 2022 there has been a 14 percent reduction in GHG emissions at the statewide level,

according to the 2022 GHG inventory data published by CARB.¹³ Assuming that 2023 GHG values are similar to the 2022 GHG inventory, that CVAG jurisdictions have similar GHG inventory trends to State totals, and that CVAG jurisdictions GHG reduction targets follow the SB 32 statewide mandate, jurisdictions on average would need to decrease emissions by about 30 percent from 2023 levels to reach the 2030 SB 32 target.

Another common GHG reduction target is one that's based on GHG emissions per service population (SP), which includes GHG emissions per residents of a jurisdiction and employees working in that jurisdiction. The SP target for 2030 for each jurisdiction was calculated by reducing the 2023 GHG emissions per SP by 30 percent (consistent with SB 32 as explained above).

After determining the mass-based SP targets using both RIVCOM and DOF scenarios, CVAG jurisdictions selected relevant targets that were appropriate for their city using either RIVCOM or DOF scenario. Some CVAG jurisdictions previously established either mass-based or SP GHG reduction targets as part of planning initiatives. All of this is summarized in **Table 2-4** below.

Table 2-4			
CVAG Jurisdictions 2030 Emissions Reduction Targets			
Jurisdiction	Mass or Service Population (SP)	2030 Target	Description
Blythe**	Mass	53,413 MTCO ₂ e	30% below 2023 levels by 2030
Cathedral City**	SP	3.05 MTCO ₂ e/SP	30% below 2023 levels by 2030
Coachella*	SP	5.13 MTCO ₂ e/SP	7.0 MTCO ₂ e per SP in 2020 and 4.2 MTCO ₂ e per SP in 2035 ¹⁴ NOTE: 2030 values interpolated based on 2035 target
Desert Hot Springs**	SP	3.04 MTCO ₂ e/SP	30% below 2023 levels by 2030
Indian Wells**	SP	9.56 MTCO ₂ e/SP	30% below 2023 levels by 2030
Indio*	SP	4.20 MTCO ₂ e/SP	4.2 MTCO ₂ e per SP by 2030 ¹⁵
La Quinta*	Mass	359,538 MTCO ₂ e	28% below 2006 levels by 2020 ¹⁶ NOTE: 2030 values interpolated based on 2035 target
Palm Desert**	SP	5.27 MTCO ₂ e/SP	30% below 2023 levels by 2030
Palm Springs*	Mass	297,430 MTCO ₂ e	40% below 1990 levels by 2030 ¹⁷
Rancho Mirage**	SP	7.19 MTCO ₂ e/SP	30% below 2023 levels by 2030
* GHG reduction targets established as part of previous planning initiatives			
** DOF scenario			

2045 Targets

While individual CVAG jurisdictions have set individual GHG emissions reduction goals for 2030, achieving California's AB 1279 targets (85 percent below 1990 levels) will require a coordinated approach at the city, county, regional, and statewide levels. Using the available 2022 California GHG inventory and assuming that the 2023 statewide GHG inventory is similar to 2022, CVAG's subregional 2045 goal aligned with AB 1279 is equivalent to an 83 percent reduction in GHG emissions from 2023 levels. **Table 2-5** summarizes the subregional 2045 goals for CVAG, which show a mass-based GHG emissions target as well as a SP target expressed in absolute terms. The 2030 GHG emissions reduction target is identified for comparison.

¹³ CARB, 2024

¹⁴ City of Coachella, 2015

¹⁵ City of Indio, 2019

¹⁶ City of La Quinta, 2013

¹⁷ City of Palm Springs, 2021

Table 2-5		
CVAG Subregional Emissions Reduction Targets for 2030 and 2045 ^a		
Data/Metric	RIVCOM	DOF
2023 Baseline Emissions for all 10 cities (MTCO ₂ e)	3,467,267	3,410,566
2023 Population	431,847	389,635
2023 Employment	181,284	176,400
2023 Service Population (SP)	613,131	566,035
2023 (Baseline) GHG per SP (MTCO ₂ e/SP) ^b	5.66	6.03
2030 GHG SP Target (MTCO₂e/SP) – 30% reduction	3.96	4.22
2030 Service Population	691,642	596,535
2030 GHG Emissions Target (Total MTCO₂e)	2,427,087	2,387,779
2045 GHG SP Target (MTCO₂e/SP) – 82.6% reduction	0.98	1.05
2045 Service Population	859,871	675,260
2045 GHG Emissions Target (Total MTCO₂e)	603,304	593,534
NOTES:		
a – Numbers represent the 10 CVAG jurisdictions.		
b – GHG Per Service Population = emissions divided by service population (population + employment).		

Unincorporated Riverside County

Unincorporated Riverside County GHG Emissions Inventory

Riverside County has demonstrated a long-standing commitment to sustainable planning and climate action, aligning local development with broader state goals for GHG reduction for the unincorporated portion of Riverside County. Through its CAP and subsequent updates, Riverside County has worked to integrate energy efficiency, renewable energy, sustainable transportation, and waste reduction into its growth strategy. These efforts are designed not only to reduce emissions but also to support economic vitality, public health, and environmental equity across the region. Riverside County's most recent CAP from 2019 aligns with California's climate legislation and reflects a proactive approach to meeting state-mandated emissions targets through both policy and implementation.

Riverside County's community-wide GHG inventory for the unincorporated portion of Riverside County, based on 2017 data, offers a broad view of emissions trends in the unincorporated areas surrounding CVAG jurisdictions. Summarized in **Table 2-6** below, it estimated emissions at approximately 4.9 million MTCO₂e, with transportation, agriculture, and building energy use as the primary sources. Specifically, transportation accounts for 36 percent of emissions, followed by agriculture accounting for 34 percent, and electricity and natural gas use in buildings accounting for 24 percent.

Table 2-6	
2017 Community-Wide GHG Emissions by Source (MTCO₂e) for Unincorporated Riverside County	
Emissions Category	Emissions
On-Road Transportation	1,766,784
Agriculture	1,670,954
Energy (Electricity and Natural Gas)	1,188,138
Solid Waste	204,365
Water and Wastewater	44,606
Aviation	26,786
Off-Road Sources	3,883
Total	4,905,518

Unincorporated Riverside County Emissions Forecast

Riverside County's BAU emissions forecast for the unincorporated portion of Riverside County outlines how GHG emissions are expected to evolve if no new climate policies are introduced beyond those

already in place as of 2017. The projections are based on anticipated increases in population, housing, employment, and travel activity, using demographic and economic growth assumptions from the County's 2015 General Plan. Emissions are calculated by applying current consumption patterns, such as energy use per household or vehicle miles traveled, to future growth estimates. Although the County's 2015 General Plan measures are reflected in the 2017 baseline and are expected to reduce emissions through 2020, the forecast assumes no further reductions after that point. Under this BAU scenario, emissions are projected to more than double by 2045, reaching over 10 MTCO_{2e}, with transportation and energy use contributing the most, as seen in **Table 2-7**.

Sector	2017 (MTCO_{2e})	2020 (MTCO_{2e})	% Change 2017–2020	2030 (MTCO_{2e})	% Change 2017–2030	2045 ^a (MTCO_{2e})	% Change 2017–2045
On-Road Transportation	1,766,784	1,999,268	13.1%	3,018,767	70.0%	5,916,574	235%
Agriculture	1,670,954	1,565,873	-6.2%	1,261,044	-24.5%	928,655	-44%
Electricity	712,928	774,289	8.6%	1,017,153	42.6%	1,571,921	120%
Natural Gas	475,211	515,845	8.5%	676,742	42.4%	1,043,506	120%
Solid Waste	204,365	223,448	9.3%	298,585	46.1%	474,512	132%
Water & Wastewater	44,606	48,771	9.3%	65,171	46.1%	103,570	132%
Aviation	26,786	26,786	0.0%	26,786	0.0%	26,786	0%
Off-Road Sources	3,883	4,024	3.6%	4,531	16.6%	5,441	40%
Total	4,905,518	5,158,305	5.1%	6,368,781	29.8%	10,070,965	105%

NOTES:
a – Interpolated based on the Riverside County CAP calculations through 2050

Unincorporated Riverside County Emission Reduction Targets

California has established a series of GHG reduction targets for 2030 and 2045 through legislation, aiming to significantly cut emissions over time. Local governments are recognized as key contributors to achieving these statewide goals. As described above, the State's GHG targets are to reduce emissions to 40 percent of 1990 levels by 2030, and 85 percent below 1990 levels by 2045. To align with these benchmarks, the unincorporated portion of Riverside County would need to cut emissions by over half a million metric tons of CO_{2e} annually to achieve the 2030 target, and by 2045, nearly three million metric tons would need to be reduced each year to be consistent with the state's climate trajectory. **Table 2-8** outlines these reduction targets by year.

Emissions, Goals, and Targets	2008	2017	2020	2030	2045 ^a
BAU Emissions (MTCO _{2e})	7,012,938	4,905,518	5,158,305	6,368,781	10,070,965
ABAU Emissions (MTCO _{2e})	–	–	4,861,256	4,102,109	4,156,887
State-Aligned Target (% change from 1990)	–	–	0	-40	-85
State-Aligned Target (% change from 2008)	–	–	-15	-49	-86 ^b
State-Aligned Target (MTCO _{2e})	–	–	5,960,997	3,576,598	981,811
Reductions from ABAU needed to meet the Target (MTCO _{2e})	–	–	Target Met	525,511	3,175,076

NOTES:
a – Interpolated based on the Riverside County CAP calculations through 2050
b – Calculated based on State GHG inventory data for 2008 and AB 1279 GHG target for 2045. Specifically, California GHG inventory for 1990 is 431 MMTCO_{2e} and 478.8 MMTCO_{2e} for 2008. The 2008 GHG emissions would need to be reduced by 86 percent to achieve the AB 1279 GHG target of 64.65 MMTCO_{2e}.

SBCOG

SBCOG Greenhouse Gas Emissions Inventory

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 2-9 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 the 2008 inventory, contributing to 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). **Figure 2-5** shows GHG emissions for the year 2016 by sector for the SBCOG subregion. 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. Carbon sinks are also included as an informational item, but do not decrease the subregion's overall GHG emissions.

Figure 2-5. 2016 % of Total Emissions by Sector

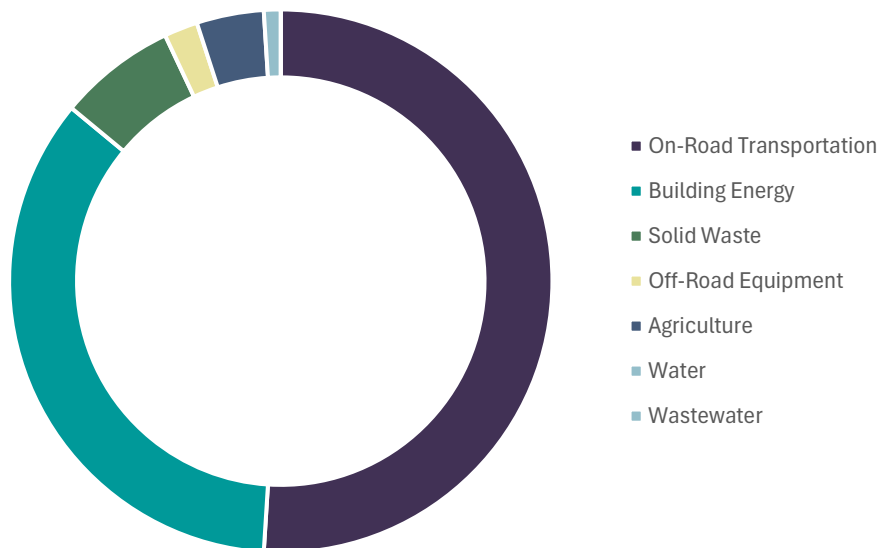


Table 2-9
SBCOG Subregion – 2008 and 2016 Community GHG Emissions by Sector (MTCO₂e)

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	5,504,463	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	15,972,244	100%	18%
Stationary Sources ^b	3,944,181	5,595,148		42%
Carbon Sinks				
Natural and Working Lands ^c	39,050,569			
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.				
c – Natural and working lands is a 2023 estimate and is included for informational purposes.				

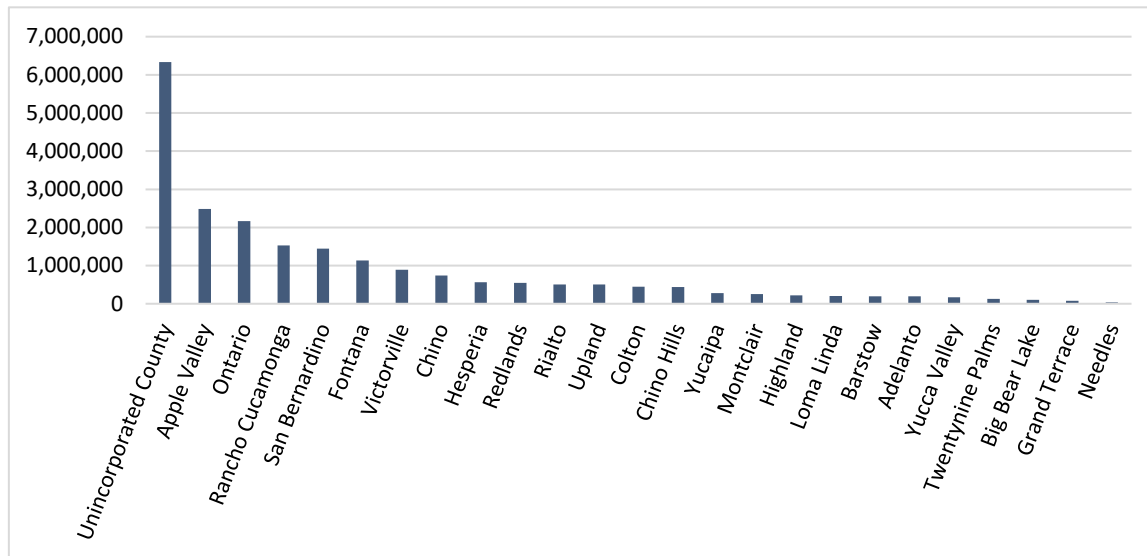
The 2008 and 2016 inventories are based mostly on actual activity data from the respective years, emission factors from 2008 or 2016, and socioeconomic data (i.e., population, household, and employment) for the subregion. The inventories include all significant contributing sectors to GHG emissions, 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 2-9 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 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.¹⁸ 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.

¹⁸ SBCOG, 2021

Figure 2-6 2016 Baseline GHG Emissions for SBCOG's 25 Partnership Jurisdictions by jurisdiction (MTCO₂e)



SBCOG Emissions Forecast

Projections of future emissions within the SBCOG subregion were developed and analyzed for the years 2030 and 2045 under BAU conditions. BAU emissions refer to GHG emissions that would occur in the absence of any state, regional, or local initiatives aimed at reducing emissions over time. Without such initiatives, if the SBCOG subregion were to continue its historical patterns of vehicular travel, energy consumption, water usage, agricultural practices, and waste/wastewater generation and disposal, the resulting emissions would be considered as business-as-usual. BAU emission forecasts were created using estimates of population, household, and employment growth within each participating city. The socioeconomic growth factors utilized in the analysis are summarized in **Table 2-10**.

Metric	2016	2030	2045
Population	2,134,967	2,463,500	2,809,889
Households	631,608	752,884	878,202
Employment	791,252	925,991	1,063,848
Service Population ^b	2,926,219	3,389,491	3,873,737

NOTES:
a – Socioeconomic data is provided by SBCTA/SBCOG, with input obtained from each member jurisdiction.
b – Service population = population + employment.

Figure 2-7 depicts the contribution of various activities to total subregional GHG emissions, excluding stationary sources and carbon sinks.

Figure 2-7 2016 Baseline GHG Emissions and 2030 and 2045 BAU GHG Emissions Forecast for SBCOG's 25 Partnership Jurisdictions by Activity (MTCO₂e)

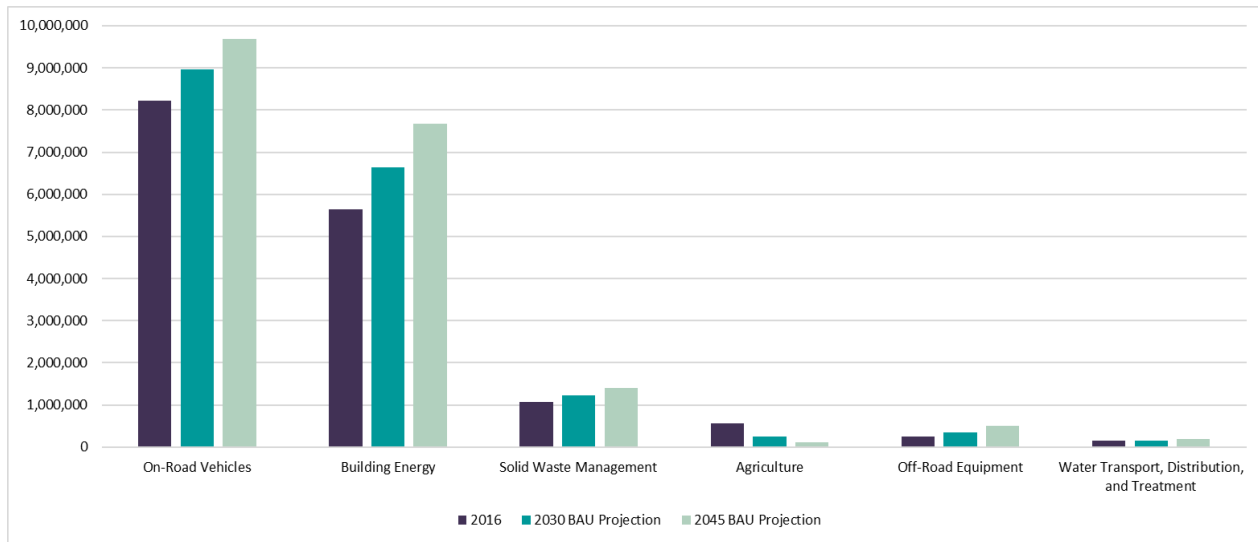


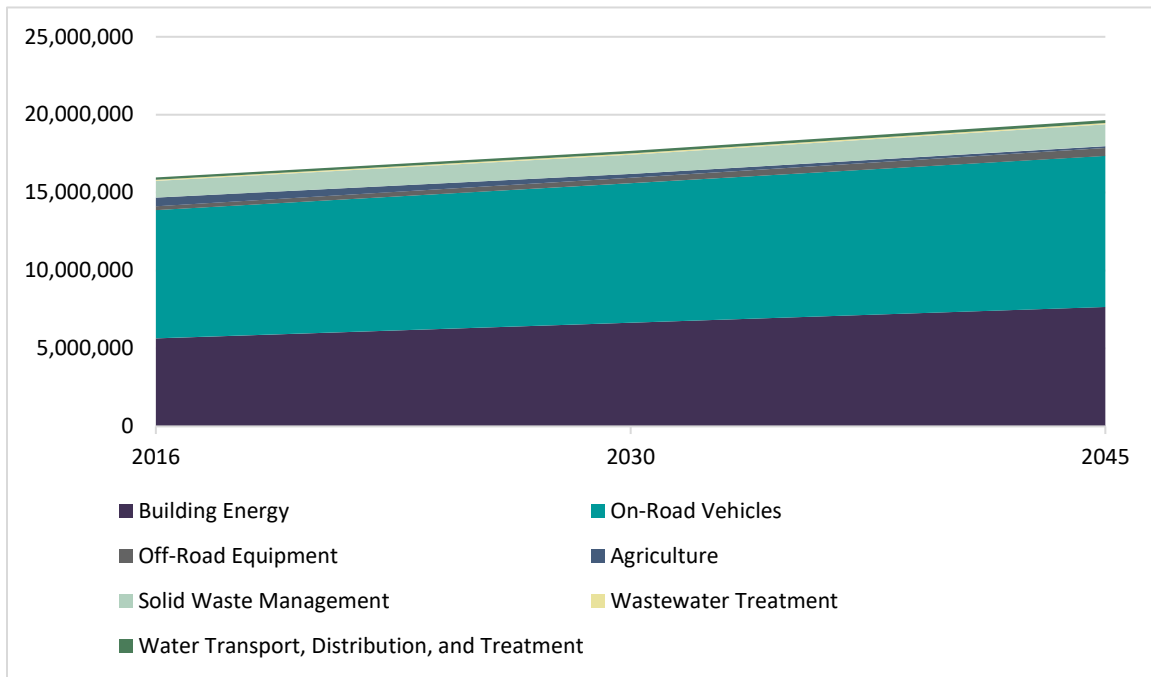
Table 2-11 presents community BAU emissions forecasts by sector for 2030 and 2045, for the SBOG cities. On-road transportation is expected to contribute the largest share of emissions through 2045. Under BAU conditions, the relative contributions from each sector are expected to be similar in 2030 and 2045. Overall, BAU emissions are expected to increase approximately 11 percent from 2016 to 2030, and approximately 23 percent from 2016 to 2045. Note that the BAU forecasts do not include freight rail or large stationary source emissions since the local jurisdictions do not have control over those sources.

Table 2-11						
Historical and Business-As-Usual Emissions by Sector for SBCOG Cities (MTCO ₂ e)						
Sector	2016		2030		2045	
	Emissions	Percent	Emissions	Percent	Emissions	Percent
Building Energy	5,649,589	35.40%	6,647,783	37.60%	7,664,821	39.00%
Residential Natural Gas	1,246,576	7.80%	1,494,075	8.50%	1,750,408	8.90%
Non-Residential Natural Gas	965,955	6.00%	1,143,111	6.50%	1,323,963	6.70%
Residential Electricity	1,230,762	7.70%	1,420,522	8.00%	1,615,033	8.20%
Non-Residential Electricity	2,206,297	13.80%	2,590,075	14.60%	2,795,418	15.10%
On-Road Vehicles	8,223,640	51.50%	8,955,209	50.70%	9,695,447	49.30%
Light-Medium Duty Vehicles	6,108,245	38.20%	6,473,242	36.60%	6,882,208	35.00%
Heavy-Duty Vehicles	2,115,395	13.20%	2,481,967	14.00%	2,813,239	14.30%
Off-Road Equipment	247,911	1.60%	341,637	1.90%	503,215	2.60%
Agriculture	559,685	3.50%	254,938	1.40%	113,656	0.60%
Solid Waste Management	1,074,629	6.70%	1,234,462	7.00%	1,402,324	7.10%
Wastewater Treatment	70,039	0.40%	78,835	0.40%	89,874	0.50%
Water Transport, Distribution, and Treatment	146,750	0.90%	161,588	0.90%	183,023	0.90%
Total Emissions	15,972,244	100%	17,674,452	100%	19,652,360	100%
Emissions for Informational Purposes						
Stationary Sources ^a	5,595,148	NA	7,061,714	NA	10,051,098	NA
Carbon Sinks						
Natural and Working Lands (2023) ^b	39,050,569					
NOTES:						
a – Total Emissions do not include Stationary Sources emissions. Emissions in this sector are not within the jurisdictional control of local municipalities and are thus not appropriate to include in a jurisdiction's accounting of GHG emissions.						
b – Forecasting natural and working lands (NWL) emissions in SBCOG is challenging due to the region's diverse land uses and rapid urbanization. The region faces growing development pressure and increasing wildfire risk, which adds significant uncertainty to projections of carbon sinks.						
NA – Not applicable.						
NQ – Did not quantify.						

Table 2-12 provides an overview of the SBCOG subregion’s emissions by city, for 2016 as well as forecasted BAU emissions for the years 2030 and 2045, indicating how each city’s emissions would increase in the absence of regulations and other actions to reduce emissions. **Figure 2-8** depicts the BAU forecast of community emissions by sector (not including stationary sources) for the years 2030 and 2045.

Table 2-12 San Bernardino Regional Community Greenhouse Gas Inventory and Forecast by Jurisdiction (2016, 2030, and 2045) (MTCO₂e)						
Jurisdiction	2016 Inventory		2030 BAU Forecast		2045 BAU Forecast	
	Emissions	Percent	Emissions	Percent	Emissions	Percent
Adelanto	191,431	1%	273,216	1%	363,843	1%
Apple Valley	455,802	12%	544,216	14%	633,784	19%
Barstow	192,539	1%	232,535	1%	277,360	1%
Big Bear Lake	105,769	0%	115,809	0%	126,307	0%
Chino	736,215	3%	785,555	3%	843,480	3%
Chino Hills	438,898	2%	434,884	2%	430,952	1%
Colton	448,948	2%	526,453	2%	599,529	2%
Fontana	1,130,927	5%	1,301,505	5%	1,487,115	5%
Grand Terrace	78,066	0%	90,587	0%	104,193	0%
Hesperia	563,369	3%	710,136	3%	874,079	3%
Highland	218,940	1%	251,432	1%	289,831	1%
Loma Linda	203,924	1%	202,951	1%	200,884	1%
Montclair	254,852	1%	260,101	1%	265,964	1%
Needles	26,247	0%	43,847	0%	56,081	0%
Ontario	2,091,964	10%	2,260,363	10%	2,546,011	9%
Rancho Cucamonga	1,495,685	7%	1,570,575	6%	1,654,181	6%
Redlands	546,000	3%	599,876	2%	658,453	2%
Rialto	508,304	2%	575,269	2%	641,653	2%
San Bernardino	1,440,525	7%	1,553,719	6%	1,679,882	6%
Twentynine Palms	125,545	1%	156,802	1%	191,139	1%
Unincorporated County	6,334,474	29%	7,040,202	28%	8,222,303	28%
Upland	501,746	2%	536,496	2%	574,278	2%
Victorville	889,825	4%	1,066,792	4%	1,261,623	4%
Yucaipa	280,522	1%	336,285	1%	393,842	1%
Yucca Valley	172,732	1%	193,090	1%	218,180	1%
Total	15,972,224	100%	17,674,452	100%	19,652,359	100%

Figure 2-8 SBCOG Subregion: Business-As-Usual GHG Emissions Forecast by Sector (MTCO₂e) – All Cities Combined



SBCOG Emission Reduction Targets

2030 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**.

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%

Table 2-13
SBCOG Jurisdictions Baseline Level and 2030 Emissions Reduction Targets

Jurisdiction	Baseline level	Reduction % by 2030
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 (SB32; 1990 emissions levels are now approximately equivalent to 2016–2020 emissions levels after successful state reduction efforts). As such, 40 percent below 2016 levels is roughly equivalent to the SB 32 reduction target and will put SBCOG on a path toward the state's long-term goal to achieve net zero carbon emissions by 2045.

2045 Targets

While individual SBCOG jurisdictions set individual GHG emissions reduction goals for 2030, achieving California's AB 1279 targets (85 percent below 1990 levels) will require a coordinated effort across city, county, and statewide planning agencies. Given this requirement, SBCOG set a subregional GHG emissions reduction goal for 2045. Using the estimated emissions reductions achieved in 2016, based on the statewide GHG inventory, SBCOG's subregional 2045 goal is 84 percent emissions reduction from 2016 levels. **Table 2-14** below summarizes the subregional 2030 and 2045 goals for SBCOG, which indicate an absolute GHG emissions target as well as a per service population reduction target. The service population target is based on the sum of SBCOG's population and employment data.

Table 2-14
SBCOG Subregional Emissions Reduction Targets for 2030 and 2045

Data/Metric	Amount (MTCO ₂ e) ^a
2016 Baseline Emissions for all 25 cities	15,972,244
2016 Population ^b	2,134,967
2016 Employment ^b	791,252
2016 Service Population (SP)	2,926,219
2016 (Baseline) GHG SP (MTCO ₂ e/SP) ^c	5.5
2030 GHG SP Target (MTCO₂e/SP) – 40% reduction	3.3
2030 Service Population	3,389,491
2030 GHG Emissions Target (Total MTCO₂e)	11,185,320
2045 GHG SP Target (MTCO₂e/SP) – 84% reduction	0.88
2045 Service Population	3,873,737
2045 GHG Emissions Target (Total MTCO₂e)	3,408,899

NOTES:

a – Numbers represent the 25 SBCOG jurisdictions, including the unincorporated county.

b – Based on socioeconomic data from SBCOG, 2019.

c – GHG SP = emissions divided by service population (population + employment).

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.

As part of WRCOG's 2022 Subregional CAP update, GHG emissions inventories were compiled for all WRCOG jurisdictions in each subregion.¹⁹ 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 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 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 2-15 summarizes the community-wide inventories developed for the 18 member cities of WRCOG,²⁰ 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).

Sector	2010 Emissions	% of Total	2017 Emissions	% of Total	2010–2017 % Change
On-Road Transportation	4,305,812	44.4%	3,862,079	43.8%	-10.3%
Electricity	2,886,807	29.8%	2,426,354	27.5%	-16.0%
Natural Gas	1,508,730	15.6%	1,243,903	14.1%	-17.6%
Solid Waste	366,966	3.8%	493,433	5.6%	34.5%
Off-Road Equipment	320,138	3.3%	362,752	4.1%	13.3%
Agriculture	109,918	1.1%	85,846	1.0%	-21.9%
Large Stationary Sources ^a	15,909	0.2%	170,723	1.9%	973.1%
Water	102,758	1.1%	93,971	1.1%	-8.6%
Wastewater	27,116	0.3%	28,477	0.3%	5.0%
Freight Rail	36,658	0.4%	36,036	0.4%	-1.7%
Commuter Rail	9,262	0.1%	13,704	0.2%	48.0%
Total – With Large Stationary Sources and Freight Rail ^b	9,690,073	100.0%	8,817,277	100.0%	-9.0%
Total – Without Large Stationary Sources and Freight Rail ^b	9,637,506	-	8,610,519	-	-10.7%
Carbon Sinks					
<i>Natural and Working Lands (2023)</i>	999,778				
NOTES:					

¹⁹ 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.

²⁰ GHG emissions for unincorporated western Riverside County are not included here. The unincorporated County extends across both the WRCOG and CVAG subregions, and as of 2019 the County adopted a CAP that demonstrates how the County can achieve GHG reduction targets consistent with those established by the State of California. More information is included in the section on Unincorporated Riverside County.

Table 2-15 WRCOG Cities – 2010 and 2017 Community GHG Emissions by Sector (MTCO ₂ e)					
Sector	2010 Emissions	% of Total	2017 Emissions	% of Total	2010–2017 % Change
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. NQ – Did not quantify.					

Table 2-15 profiles GHG emissions across the entire subregion by sector, including 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 MTCO₂e reduce their emissions over time in line with the California Global Warming Solutions Act of 2006 (AB 32).²¹ 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 on sources over which they have jurisdictional control or influence. **Table 2-15** presents one emissions total for the subregion that is inclusive of these sources and one that excludes them.

Table 2-15 shows that total emissions for WRCOG cities, excluding large rail and large stationary sources covered under the state’s Cap and Trade program, decreased by approximately 10.7 percent from 2010. Reductions in absolute terms were greatest in the on-road transportation sector, followed by the non-residential energy and residential energy sectors. For both years, on-road transportation has been the biggest contributor to the subregion’s emissions, followed by building energy and solid waste. In terms of emission trends, on-road transportation was 10.3 percent lower in 2017 than in 2010 while electricity and natural gas emissions decreased by approximately 16 and 17.6 percent, respectively. Solid waste emissions increased by 34.5 percent from 2010 to 2017. Large stationary sources represent the anomalous sector, increasing by nearly 975 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 2-9 provides a graphical depiction of each sector’s contribution to the 2017 WRCOG Subregional Inventory, showing on-road transportation at 43.8 percent, followed by electricity at 27.5 percent, natural gas at 14.1 percent, solid waste at 5.6 percent, and off-road equipment at 4.1 percent. All other sectors contributed less than 3 percent to the total. **Figure 2-10** depicts the 2017 inventory results by jurisdiction.

²¹ 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.

Figure 2-9 2017 WRCOG Emissions by Sector – All Cities

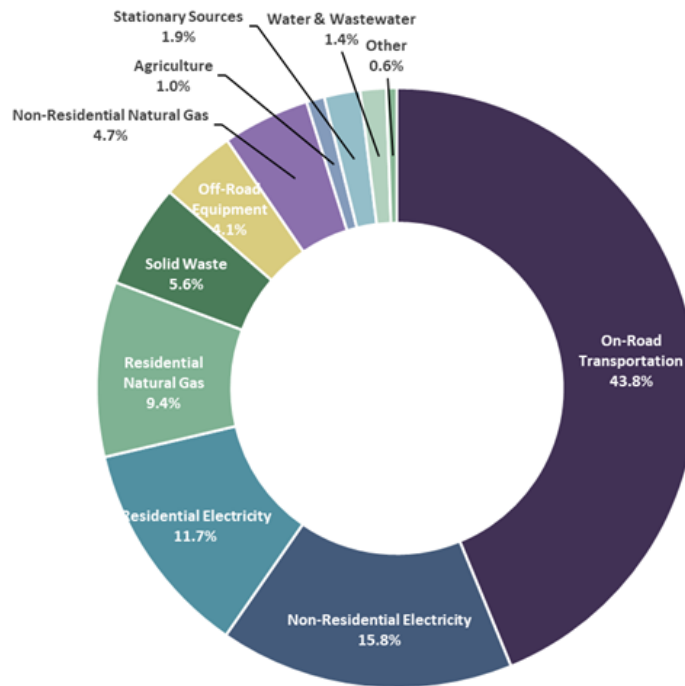
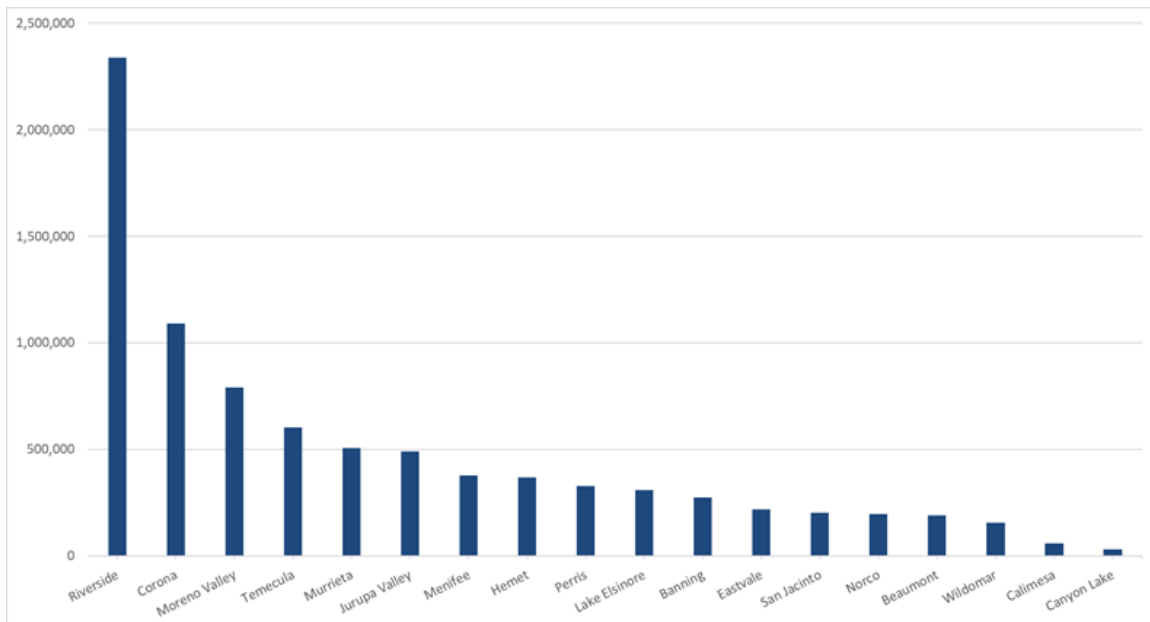


Figure 2-10 WRCOG 2017 Community Emissions by City (MTCO₂e)



GHG Emissions Forecast

Forecasts of future emissions in the WRCOG subregion were developed for the years 2030 and 2045 under “business-as-usual” (BAU) conditions. BAU emissions are GHG emissions that would take place in the absence of state, regional, and local actions designed to reduce emissions over time. In the absence of such actions, if the WRCOG subregion were to continue historic trends of vehicular travel, energy consumption, water consumption, agriculture, and waste/wastewater generation and disposal, the resulting emissions would be considered business-as-usual (BAU). BAU emissions forecasts were developed using estimates for population, household, and employment growth within each participating city.²² Socioeconomic growth factors used for the analysis are summarized in **Table 2-16**.

Table 2-16				
WRCOG Cities – Socioeconomic Data ^a				
Metric	2010	2017	2030	2045
Population	1,469,031	1,585,703	1,816,411	2,082,614
Households	456,211	476,924	567,065	671,074
Employment	381,621	478,884	649,342	846,024
Service Population ^b	1,850,652	2,064,587	2,465,753	2,928,638
NOTES:				
a – Socioeconomic data is from RIVCOM.				
b – Service population = population + employment.				

Table 2-17 presents community BAU emissions forecasts by sector for 2030 and 2045, for the WRCOG cities. Transportation is expected to contribute the largest share of emissions through 2045. Under BAU conditions, the relative contributions from each sector are expected to be similar in 2030 and 2045. Overall, BAU emissions are expected to increase approximately 25 percent from 2017 to 2030, and approximately 54 percent from 2017 to 2045. Note that the BAU forecasts do not include freight rail or large stationary source emissions listed in **Table 2-17** since the local jurisdictions do not have control over those sources.

Table 2-17						
Historical and Business-As-Usual Emissions by Sector for WRCOG Cities (MTCO _{2e})						
Sector	2010	2017	2030 BAU	% of Total	2045 BAU	% of Total
On-Road Transportation	4,305,812	3,862,079	4,842,047	44.8%	6,040,887	45.5%
Electricity	2,886,807	2,426,354	3,153,909	29.2%	3,952,717	29.7%
Natural Gas	1,508,730	1,243,903	1,544,402	14.3%	1,891,070	14.2%
Solid Waste	366,966	493,433	557,094	5.2%	630,544	4.7%
Off-Road Equipment	320,138	362,752	404,299	3.7%	448,040	3.4%
Agriculture	109,918	85,846	74,366	0.7%	63,763	0.5%
Water	102,758	93,971	177,036	1.6%	205,275	1.5%
Wastewater	27,116	36,036	33,853	0.3%	40,057	0.3%
Commuter Rail	9,262	13,704	15,453	0.1%	17,471	0.1%
Total	9,637,506	8,610,519	10,802,459	100%	13,289,824	100%
Carbon Sinks						
Natural and Working Lands	NQ					
Note: Totals may not add up due to rounding						
NQ – Did not quantify.						

Table 2-18 Provides a breakdown of the WRCOG subregion’s emissions by city, for 2010 and 2017, as well as forecasted BAU emissions for the years 2030 and 2045, indicating how each city’s emissions would increase in the absence of regulations and other actions to reduce emissions. **Figure 2-11** depicts the BAU forecast of community emissions by sector for the years 2030 and 2045.

²² WRCOG, n.d.

Table 2-18
WRCOG Subregional GHG Inventory and BAU Forecast by City

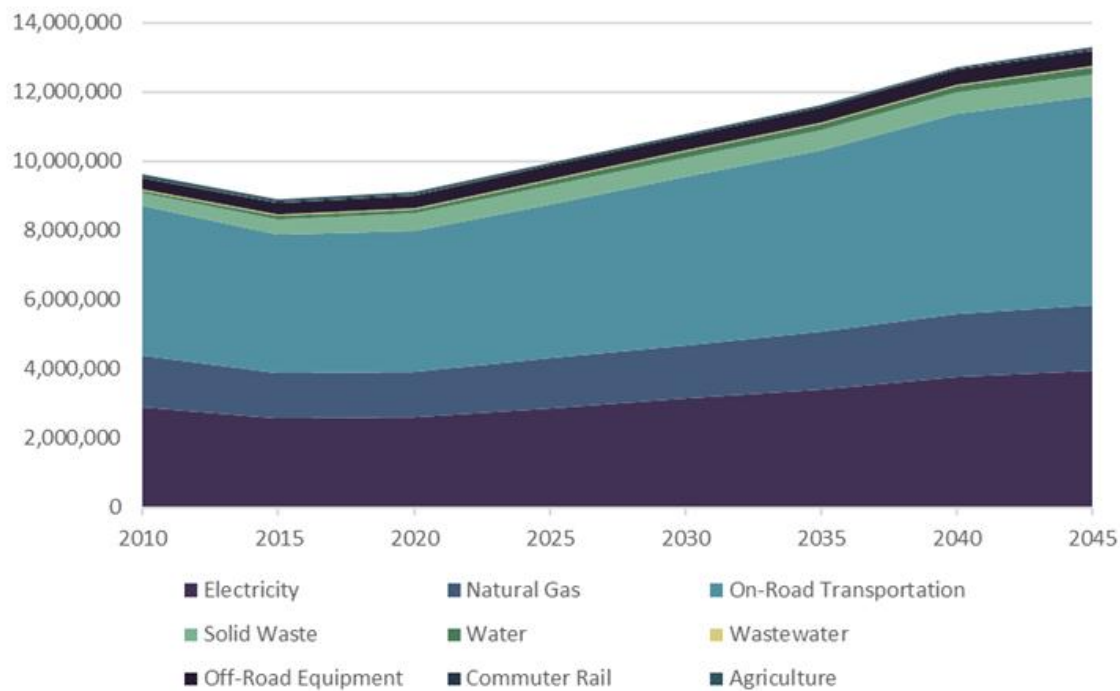
Jurisdiction	Baseline (2010) Service Population ^a	2010 Emissions (MTCO ₂ e) ^b	2017 Emissions (MTCO ₂ e)	2030 BAU Forecast (MTCO ₂ e)	2045 BAU Forecast (MTCO ₂ e)
Banning	40,857	272,096	280,821	370,609	473,996
Beaumont	39,137	222,024	196,397	272,363	358,552
Calimesa	12,682	67,515	61,220	91,525	126,845
Canyon Lake	11,837	53,981	29,223	30,021	32,528
Corona	201,238	1,369,901	1,092,898	1,324,764	1,593,427
Eastvale	53,565	216,632	221,093	258,250	299,379
Hemet	110,566	415,961	376,680	484,733	607,061
Jurupa Valley	119,477	526,622	492,894	607,693	737,586
Lake Elsinore	63,980	354,993	312,687	422,249	548,358
Menifee	88,100	428,138	386,375	488,223	603,824
Moreno Valley	221,540	820,507	801,060	982,315	1,188,962
Murrieta	112,050	571,959	510,276	611,890	725,246
Norco	37,628	208,046	196,298	241,865	293,507
Perris	85,473	336,838	336,345	432,849	543,930
Riverside	436,816	2,773,574	2,344,974	2,932,580	3,590,204
San Jacinto	52,778	203,872	211,075	303,744	409,734
Temecula	128,280	641,959	604,027	743,581	899,771
Wildomar	34,650	152,888	156,175	203,207	256,913
Totals	1,850,652	9,637,506	8,610,519	10,802,459	13,289,824

NOTES:

a – Socioeconomic data is from RIVCOM.

b – For two cities, Eastvale and Jurupa Valley, 2011 was used as the baseline year.

Figure 2-11 WRCOG Subregion: Business-As-Usual GHG Emissions Forecast by Sector (MTCO₂e) – All Cities Combined



GHG Emission Reduction Targets

California's SB 32 requires a statewide reduction in GHG emissions of 40 percent below 1990 levels by 2030, while AB 1279 requires a statewide reduction of 85 percent below 1990 levels. Accounting for presumed growth in population and emissions from 1990 through WRCOG's baseline inventory year of 2010, these statewide mandates translate to reduction targets of approximately 50 below 2010 levels by 2030, and 87 percent below 2010 levels by 2045.²³ **Table 2-19** summarizes the derivation of absolute emissions reduction targets for 2030 and 2045.

Table 2-19 Derivation of Absolute GHG Emissions Targets for WRCOG Cities	
Data/Metric	Amount (MTCO ₂ e) ^a
2010 Baseline Emissions for all 18 cities	9,637,506
2030 Target (~50% below 2010 emissions)	4,818,753
2045 Target (~87% below 2010 emissions)	1,252,876
NOTES:	
a – Numbers represent the 18 WRCOG jurisdictions.	

An alternative method for establishing subregional targets consistent with the State's target is to derive them on an efficiency basis, to explicitly account for the growth in population and employment in WRCOG cities. **Table 2-20** shows the derivation of 2030 and 2045 reduction targets, based on population and jobs numbers in the WRCOG cities for the baseline year of 2010.

Table 2-20 Derivation of 2030 Efficiency Metric for WRCOG Cities	
Data/Metric	Amount (MTCO ₂ e) ^a
2010 Baseline Emissions for all 18 cities	9,637,506
2010 Population ^b	1,469,031
2010 Employment ^b	381,621
2010 Service Population (SP)	1,850,652
2010 (Baseline) GHG Efficiency Metric (MTCO ₂ e/SP) ^c	5.21
2030 GHG SP Target (MTCO₂e/SP) – 50% reduction	2.61
2030 Service Population	2,465,753
2030 GHG Emissions Target (Total MTCO₂e)	6,435,615
2045 GHG SP Target (MTCO₂e/SP) – 87% reduction	0.68
2045 Service Population	2,928,638
2045 GHG Emissions Target (Total MTCO₂e)	1,991,474
NOTES:	
a – Numbers represent the 18 WRCOG jurisdictions.	
b – Based on population and employment data from RIVCOM.	
c – GHG SP Target = emissions divided by service population (residents + jobs).	

The 2030 SP target for WRCOG cities is 2.61 MTCO₂e per service population²⁴ (MTCO₂e/SP), equivalent to 50 percent below the 2010 SP target of 5.21 MTCO₂e/SP. For 2045, the SP target is 0.68 MTCO₂e/SP, equivalent to 87 percent below the 2010 efficiency metric. Using the 2030 estimated service population of 2,465,753 (from **Table 2-16**), the 2030 efficiency metric is equivalent to an absolute emission target of 6,435,615 MTCO₂e by 2030. For 2045, the estimated service population is 2,928,638 and the equivalent absolute emissions target is 1,991,474 MTCO₂e.

When setting targets for their local jurisdiction, WRCOG cities may choose to derive them based on absolute reductions or by using the efficiency metric approach. Regardless of how cities set targets,

²³ 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.

²⁴ Service population is defined as the number of jobs plus the number of residents.

achieving them will be dependent on the successful implementation of GHG reduction measures that are implemented at the state, regional, and local levels, as presented in the next section.

Entire Region (MSA)

Greenhouse Gas Emissions Inventories

The most recent GHG inventories completed for each subregion are summarized below by sector in **Table 2-21**.²⁵ The results indicate that on road transportation contributes to the largest share of subregional emissions, ranging from 36 percent to 51 percent across the subregions, followed by building energy (24 to 45 percent), solid waste disposal (3 to 7 percent), mobile off-road equipment (0.1 to 4.5 percent), agriculture (0 to 34 percent), and water conveyance and wastewater treatment (0.8 to 1.4 percent).

Table 2-21 GHG Emissions by Sector (MTCO _{2e}) for Entire Region (MSA)										
Sector	CVAG ^a (2023)	% of Sub- Regional Total ^b	SBCOG (2016)	% of Sub- Regional Total ^b	WRCOG (2017)	% of Sub- Regional Total ^b	Unincorporated Riverside County (2017)	% of Sub- Regional Total ^b	Region Total ^b	% of Region Total ^b
On-Road Transportation	1,550,113	44.7%	8,223,640	51.5%	3,862,079	44.9%	1,766,784	36.0%	15,402,616	46.7%
Building Energy ^c	1,464,682	42.2%	5,649,589	35.4%	3,670,257	42.6%	1,188,139	24.2%	11,972,667	36.3%
Solid Waste	250,020	7.2%	1,074,629	6.7%	493,433	5.7%	204,365	4.2%	2,022,447	6.1%
Off-Road Equipment	157,570	4.5%	247,911	1.6%	362,752	4.2%	3,883	0.1%	772,116	2.3%
Agriculture	1,405	0.0%	559,685	3.5%	85,846	1.0%	1,670,854	34.1%	2,317,790	7.0%
Water	28,135	0.8%	146,750	0.9%	93,971	1.1%	44,606	0.9%	313,462	1.0%
Wastewater	15,343	0.4%	70,039	0.4%	28,477	0.3%			113,859	0.3%
Commuter Rail	N/A	N/A	N/A	N/A	13,704	0.2%	N/A	N/A	13,704	0.0%
Aviation	N/A	N/A	N/A	N/A	N/A	N/A	26,786	0.5%	26,786	0.1%
Total ^b	3,467,267	100%	15,972,244	100%	8,610,519	100%	4,905,417	100%	32,955,447	100%
Carbon Sinks										
Natural and Working Lands (2023)	1,283,392		39,050,569		999,778		NQ		NQ	

NOTES:

a – Based on RIVCOM socioeconomic data.

b – Totals may not add up due to rounding.

c – Includes electricity and natural gas use in residential, commercial, and industrial buildings.

NQ – Did not quantify

GHG Emissions Forecast

The GHG emissions forecast for the MSA is calculated using socioeconomic data that's summarized in **Table 2-22**.

Table 2-22 Riverside-San Bernardino-Ontario MSA – Socioeconomic Data										
Metric	CVAG ^a		SBCOG ^b		WRCOG ^a		Unincorporated Riverside County ^c		MSA Total	
	2030	2045	2030	2045	2030	2040	2030	2045	2030	2045
Population	492,746	623,240	2,463,500	2,809,889	1,816,411	2,082,614	794,730	1,185,158	5,567,387	6,700,901
Households	187,461	243,824	752,884	878,202	567,065	671,074	285,126	418,421	1,792,536	2,211,521

²⁵ For comparison purposes, the inventory summaries in **Table 2-21** include the sectors that were included for all subregions. Please note that the subregional inventories were completed for different years, which may be suitable for high-level comparison purposes but do not include differences that may have occurred between those years (i.e., population change, economic impacts of pandemic, etc.).

Table 2-22
Riverside-San Bernardino-Ontario MSA – Socioeconomic Data

Metric	CVAG ^a		SBCOG ^b		WRCOG ^a		Unincorporated Riverside County ^c		MSA Total	
	2030	2045	2030	2045	2030	2040	2030	2045	2030	2045
Employment	198,896	236,631	925,991	1,063,848	649,342	846,024	220,151	387,429	1,994,380	2,533,932
Service Population ^d	691,642	859,871	3,389,491	3,873,737	2,465,753	2,928,638	1,300,008	1,991,008	7,846,894	9,653,254
NOTES: a – Socioeconomic data is from RIVCOM. b – San Bernardino Regional GHG Reduction Plan (2021). c – Riverside County Climate Action Plan (2019), estimated using 2020-2035 CAGR. d – Service population = population + employment.										

The business-as-usual GHG emissions forecast for each subregion in the MSA are compiled in **Table 2-23** by sector for 2030 and 2045, along with an estimate of total BAU emissions for the region. Transportation is expected to contribute the largest share of emissions through 2045. Under BAU conditions, the relative contributions from each sector are expected to be similar in 2030 and 2045.

Table 2-23
2030 and 2045 GHG Emissions Forecast by Sector (MTCO_{2e}) for Entire Region (MSA)

Sector	CVAG ^a		SBCOG		WRCOG ^b		Unincorporated Riverside County ^c		MSA Total ^d	
	2030	2045	2030	2045	2030	2045	2030	2045	2030	2045 ^e
On-Road Transportation	1,690,843	1,992,412	8,955,209	9,695,447	4,842,047	6,040,887	3,018,767	5,916,574	18,506,866	24,611,255
Building Energy ^f	1,635,545	2,004,362	6,647,783	7,664,821	4,698,311	5,843,787	1,693,895	2,615,427	14,675,534	18,435,574
Solid Waste	277,480	332,123	1,234,462	1,402,324	557,094	630,544	298,585	474,512	2,367,621	2,898,145
Off-Road Equipment	171,947	202,781	341,637	503,215	404,299	448,040	4,531	5,441	922,414	1,159,781
Agriculture	1,920	2,162	254,938	113,656	74,366	63,763	1,261,044	928,655	1,592,268	997,439
Water	31,010	37,171	161,588	183,023	177,036	205,275	65,171	103,570	434,805	541,839
Wastewater	19,361	24,488	78,835	89,874	33,853	40,057			132,049	154,419
Total ^d	3,828,106	4,595,499	17,674,452	19,652,360	10,787,006	13,272,353	6,341,993	10,044,179	38,631,557	48,798,452
NOTES: a – Based on socioeconomic data from RIVCOM. b – Does not include commuter rail emissions that are presented in the WRCOG inventory. c – Does not include aviation emissions that are presented in the Riverside CAP. d – Totals may not add up due to rounding. e – Interpolated based on the Riverside County CAP calculations through 2050. f – Combines electricity and natural gas use in residential, commercial, and industrial buildings from the Riverside County CAP.										

GHG Emission Reduction Targets

Individual 2030 GHG reduction targets were modeled for CVAG, SBCOG, and WRCOG, which vary based on baseline year and reduction percentage. In addition to the individual jurisdictions' modeled GHG reduction targets, each subregion selected county-wide goals for 2030 and 2045 that are aligned with the California's GHG reduction targets (40 percent below 1990 levels by 2030 and 85 percent below 1990

levels by 2045).^{26, 27} **Table 2-24** below summarizes these GHG reduction targets by subregion, including for Unincorporate Riverside County, which was derived from the Riverside County CAP.

Table 2-24		
Subregional GHG Reduction Targets		
Subregion	2030 Target	2045 Target
CVAG	Set independently by jurisdiction	82.6% below 2023 emissions
SBCOG	Set independently by jurisdiction	84% below 2016 emissions
WRCOG	~50% below 2010 emissions	~87% below 2010 emissions
Unincorporated Riverside County	49% below 2008 emissions	~86% below 2008 emissions

²⁶ California State Legislature, 2016

²⁷ California State Legislature, 2022

Chapter 3

GHG Reduction 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) including the Coachella Valley Association of Governments (CVAG), San Bernardino Council of Governments (SBCOG), Western Riverside Council of Governments (WRCOG), and Unincorporated Riverside County. The CCAP's GHG reduction measures cover 25 jurisdictions in San Bernardino County and 29 jurisdictions in Riverside County. These measures are organized into three sections:

- State measures that are being implemented statewide, including throughout the entire MSA.
- Regional measures that represent the entire MSA including all three COGS, selected because of their broad applicability to the region.
- Subregional and local 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 more information regarding community engagement conducted during the development of the CCAP measures, please see Appendix F. Though some of these measures may already be implemented or required by state, regional, or local authorities, others may not be and are included as options for future consideration.

State Measures Summary

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 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 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.

Energy-State-SB100: 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 the MSA (including Southern California Edison as well as community choice aggregators) must meet these targets:

1. 52 percent of retail sales from renewables by 2027
2. 60 percent of retail sales from renewables by 2030
3. 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.

Energy-State-SB350: 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 this measure 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.

Energy-State-T24: 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 the 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.

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.

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 CO₂ 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 CO₂ emissions associated with the production of grid electricity.

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.

California Governor Newsom’s Executive Order N-79-20 prohibits sales of fossil fueled vehicles after 2035. The Advanced Clean Cars II (ACCII) program, passed in 2022, supports EO N-79-20 and 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. In 2025, Congress passed H.J.Res.88, a resolution under the Congressional Review Act (CRA), to nullify the EPA’s waiver that allowed California to enforce its ACCII standards. In response, California’s government filed a lawsuit against the federal government arguing that the CRA does not apply to EPA waivers, which are adjudicatory decisions rather than rulemakings. At the time of writing this report, there have been no injunctions or rulings issued and the case remains ongoing.

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.

Recycling and Waste Diversion Mandates

Mandates diversion of organics and solid waste from the landfill waste stream.

Recycling or reusing materials rather than 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.

Water Conservation Mandates

Requires reduced 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 the 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.

California Solar Mandate

Requires solar power installation for new single-family homes.

Climate change mitigation and energy independence are top priorities in California. To address these priorities, the state implemented the California Solar Mandate to reduce GHG emissions and promote renewable energy adoption. The California Solar Mandate was adopted as a part of the 2019 Building Energy Efficiency Standards adopted by the California Energy Commission (CEC). This mandate requires most new single-family homes and low-rise multifamily buildings to include solar photovoltaic (PV) system and applied to building permits starting in 2020.

Enacted in 2018, the California Solar Mandate requires new single and multi-family homes to include solar panel installations that generate enough electricity to meet the property's annual energy needs. The solar requirement became effective in 2020 as a part of California's building codes and is designed to help California meet its ambitious climate goals, including achieving 100 percent clean energy by 2045. By integrating solar energy into the construction of new homes, the state aims to reduce its reliance on fossil fuels, lower utility bills for homeowners, and increase the resilience of the electricity grid.

Regional Measures Summary

This section profiles three regional measures, applicable to all three COGs in the MSA, that are considered highest priority for implementation. The regional measures included are the product of extensive coordination and engagement between multiple stakeholders, including CVAG, SBCOG, WROCG city and county governments, and more. The following considerations were used in evaluating and selecting the three regional measures for the CCAP.

- Community and stakeholder support.
- Magnitude of anticipated GHG reductions from 2025-2030 and from 2025-2045.
- Transformative impact – i.e., the extent to which the measure has the potential to create transformative opportunities or impacts that can lead to additional emissions reductions.
- Cost-effectiveness of GHG reductions.
- Potential for co-benefits to priority populations, including reductions in air pollutants, reductions in risks from climate impacts, and fair economic growth and improved quality of life outcomes.
- Anticipated workforce implications and quality of local job creation.

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.²⁸ 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 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 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:

- Absent any further interventions, on-road transportation GHG emissions in Coachella Valley are expected to increase by as much as 18 percent and 39 percent by 2030 and 2050, respectively.

²⁸ CEC, n.d.

- 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 all communities have 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 priority populations, 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

The potential scope of activities under this measure include:

- Program planning and siting of EVCS
 - Identify appropriate locations and site hosts.²⁹

²⁹ 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.

- 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

Geographic Coverage

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

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 the WRCOG local CAPs.³⁰

The IREN 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

³⁰ WRCOG, 2022

Vehicle Readiness Plan),³¹ SCAG (Southern California Plug-in Electric Vehicle Readiness Plan),³² SBCOG (Zero-Emission Vehicle Readiness and Implementation Plan),³³ and WRCOG (Western Riverside County Plug-in Electric Vehicle Deployment Plan),³⁴ as well as plans completed by local jurisdictions (e.g., cities of Riverside and Rancho Cucamonga).

Implementation Timelines and Milestones

The assumed project implementation schedule includes several milestones representing a phased installation of EVCS over an approximate three-year period starting late 2025 following the identification and award of funding, with the goal of complete deployment by December 31, 2028.

- Nov 2025 – April 2026: 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 priority population benefits.
- May 2026 – July 2026: Permitting of EVCS; Begin contracting for EVCS purchases.
- Aug 2026 – December 2026: Phase 1 Electrical Upgrades and EVCS installation (20 percent installation)
- 2027: Phase 2 Permitting, Electrical Upgrades and EVCS installation (60 percent installation)
- 2028: Phase 3 Permitting, Electrical Upgrades and EVCS installation (100 percent installation)
- Ongoing (starting Aug 2026): EVCS Maintenance & Program Administration & Evaluation

This schedule is consistent with many state 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.

Metrics for Tracking Progress

- Total charging capacity procured
- Charging utilization at each EVCS
- Number of EV charging equipment installed (by type and location)
- Percentage of installations in priority populations
- Average time from planning to installation
- Number of multi-family or community serving sites deployed

³¹ CVAG, 2014

³² SCAG, 2021

³³ CSE, 2019

³⁴ SCAG, 2013

- Uptime percentage of EVCS
- Average wait time at stations
- Number of customer service inquiries resolved
- Number of technicians trained
- Number of maintenance incidents reported and resolved

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 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 2030:³⁵

- Level 2 EVCS, upfront capital costs and costs per year of full operation:
 - 2.2 MTCO₂e 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 MTCO₂e 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.³⁶
- 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 CO₂e 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 2022.³⁷

³⁵ Estimates include costs from equipment and infrastructure, electricity usage, maintenance, operations, and network.

³⁶ CARB, 2023a

³⁷ USEPA, 2023

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 MTCO₂e 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 MTCO₂e 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.

Estimated Capital and Operational Costs

Table 3-1 through **Table 3-3** 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 3-1			
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 3-2			
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 3-3		
Estimated Annual Network Costs		
Level 2	DCFC	Total Annual Maintenance Cost
\$183,600	\$357,000	\$540,600
\$76,500	\$76,500	\$153,000

Estimated Emissions Reduction Estimates

Estimated annual emissions and petroleum use reductions are presented in **Table 3-4** and **Table 3-5** 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, NO_x, PM10, PM2.5, VOC, and SO_x) were estimated using CARB’s EMFAC2021 Tool.³⁸ Note that air pollutants were assumed to remain the same between the two scenarios.

Table 3-4								
Estimated Reductions in Annual Emissions and Fuel Use – 2030 BAU								
Charger Type	Petroleum Savings (barrels)	GHGs (Metric Tons)	NO_x (lb)	CO (lb)	PM10 (lb)	PM2.5 (lb)	VOC (lb)	SO_x (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 3-5								
Estimated Reductions in Annual Emissions and Fuel Use - 2030 RPS Scenario								
Charger Type	Petroleum Savings (barrels)	GHGs (Metric Tons)	NO_x (lb)	CO (lb)	PM10 (lb)	PM2.5 (lb)	VOC (lb)	SO_x (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

Existing Funding Sources

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.

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

³⁸ CARB, 2021

\$618,878 remaining for level 2 chargers through CALeVIP 1.0, but all the funding for Riverside County has been awarded as of February 2024.³⁹

CALeVIP 2.0, launched in 2021, is a continuation of the EV charging funding with an emphasis on installing high-speed DC fast chargers (DCFC) 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. Approximately 63% of this funding was allocated to California's Eastern Region, 46% of which remains unused (\$8.68 million).⁴⁰ 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, approximately \$3.48 million will be available.

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 for populations that bear the negative impacts of local pollution. Building energy emissions accounted for approximately 41 percent of total regional GHG emissions for WRCOG in 2017, 35 percent of total regional GHG emissions for SBCOG in 2016, and 42 percent of total regional GHG emissions for CVAG in 2023.

California has ambitious climate goals, including a 40 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 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

³⁹ CSE, n.d.

⁴⁰ CSE, 2023

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 affordability. 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 N₂O, 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.

The potential scope of activities under this measure is divided into municipal and residential buildings, and explained in more detail below:

- 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.

Geographic Coverage

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

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 IREN.

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.

Implementation Timelines and Milestones

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

- End of 2025: Deliver CCAP to EPA
- Throughout 2025: Identify key actions to implement for each building decarbonization measure
- Early 2026:
 - Coordinate resources across jurisdictions and take initial actions across municipal and residential building decarbonization
 - Estimate GHG emissions from the building decarbonization actions
 - Estimate priority population benefits from the building decarbonization actions
- Early 2027: Continue implementing building decarbonization actions
- Mid 2026: Implement building decarbonization pilot programs and short-term strategies for GHG reductions

- Mid-late 2027: 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

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

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 MTCO₂e per year. The proposed municipal buildings program could reduce GHG emission by 4,877 MTCO₂e 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 MTCO₂e per year. The proposed low- to moderate-income residential program could reduce GHG emission by 1.84 MTCO₂e for each single family, 1.96 MTCO₂e for each multifamily home, and 2.21 MTCO₂e 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 the County of Riverside CAP.⁴¹

Existing Funding Sources

At the time of writing this report, federal funding for energy efficiency and electrification programs is marked by a degree of uncertainty given a shift in national policy priorities. For this reason, this measure prioritizes state funding sources.

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. Per the CEC’s Notice of Proposed Awards in August 2024, Los Angeles County was awarded approximately \$329 million to administer the Direct Install program in California’s Southern region.

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, install, and apply for their qualifying products by December 31, 2025.

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. Applicants must purchase,

⁴¹ County of Riverside, 2019

install, and apply for their qualifying products by December 31, 2025. 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 2025 iteration of the IID Residential Weatherization Program (the All Weather Energy Savings Program) offers a minimum of \$1,500 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 customers can participate in this program once every five years.

IID Tree for All

In 2023, IID announced the Tree for All Program, a residential free shade program for its energy customers. In the Fall of 2024, all 1,000 available trees were reserved by September 4 and were planted planet across the Imperial and Coachella Valleys. IID projected that, by the end of 2024, more than 3,700 trees would have been planted since the program's inception. The trees available in the program were selected for their ability to both provide shade and survive in the region's desert climate. The IID is planning for future Tree for All events. IID customers can participate in this program once a year.

IID EV Charger Rebates ("ReCharge")

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. Applicants must purchase and install their qualifying product between January 1 and December 31, 2025. The program site reports that 2024 purchases could have qualified if the application was submitted by March 2025.

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. As of June 2025, budget is still available for heat pump HVAC rebates for single family residential homes of low- and moderate-income in central California. Budget is also still available for a range of products statewide, for multifamily residential and commercial buildings. The program reports

that additional commercial funding for HPWH rebates will become available for PG&E, SCE, SCG, and SDG&E customers statewide.

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. The program is paused but will reportedly restart by November 2025. Retail coupons were only redeemable through July 11 but will become redeemable again once the program relaunches.

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.

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,⁴² 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. 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

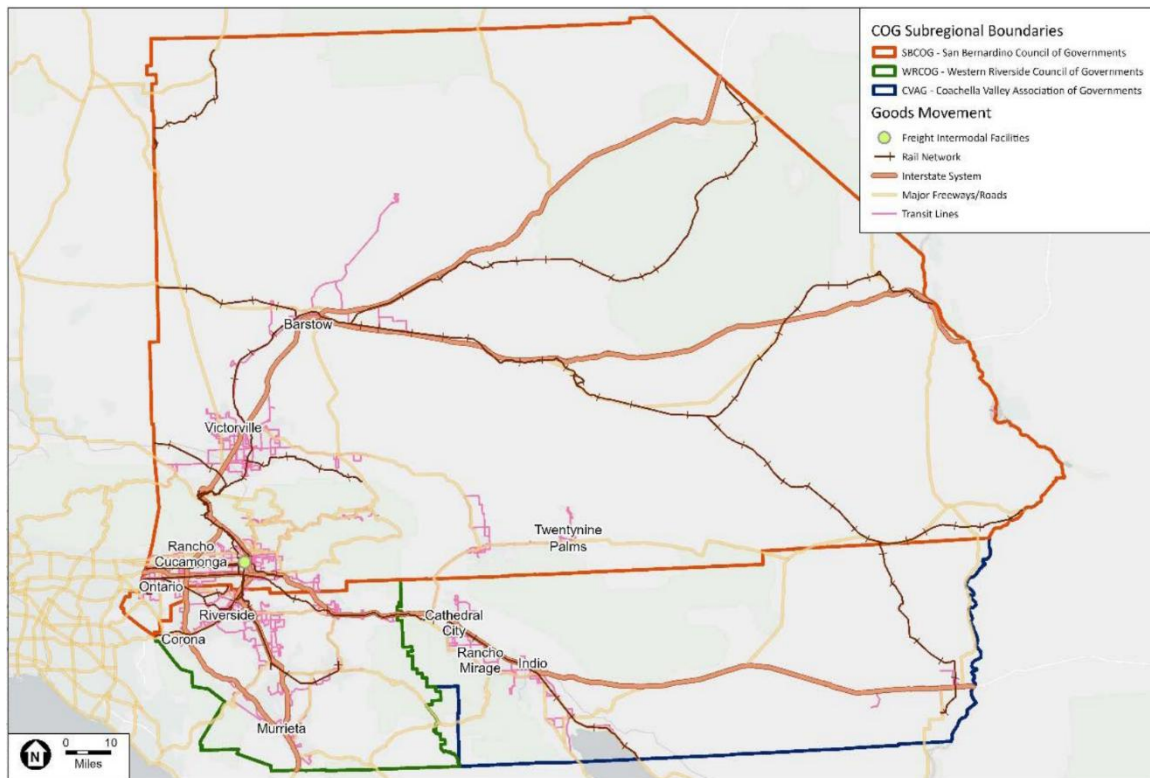
⁴² USEPA, n.d.

- WRCOG Measure LT-10: Local ZEV Programs: Infrastructure and Vehicle Purchases
- SBCOG Measure T-5: Community Fleet Electrification

Figure 3-1 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. 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.

The South Coast Air Quality Management District (SCAQMD) received the largest CPRG implementation grant in the country for a project that will focus on transitioning goods movement in the region to zero-emission (ZE) technologies. It will fund initiatives that build infrastructure to support ZE freight vehicles, that facilitate electrification of goods movement equipment, and that accelerate EV deployment across the region. SCAQMD is a critical regional partner and implementing party, and this project will promote goods movement decarbonization across the region.

Figure 3-1 Goods Movement Corridors in Riverside-San Bernardino-Ontario MSA

SOURCE: Caltrans, 2024; ESA, 2024.

Description of Regional Measure

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. The potential scope of activities is explained in more detail below.

- 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

Geographic Coverage

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

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

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	\$689

Metrics for Tracking Progress

- Number of DC fast chargers (by power level)
- Number of hydrogen fueling stations operational
- Total \$ amount of incentive programs for fleet electrification

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.⁴³

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.⁴⁴

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

⁴³ More information on this program can be found here: <https://scag.ca.gov/LMFP>

⁴⁴ CARB, 2015

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 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.⁴⁵ 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.

South Coast Air Quality Management District INVEST CLEAN

SCAQMD’s INVEST CLEAN – Infrastructure, Vehicles, and Equipment Strategy for Climate, Equity, Air Quality, and National Competitiveness project was awarded nearly \$500 million through CPRG. In alignment with the National Zero-Emission Freight Corridor Strategy, this project will fund initiatives to install EV charging sites, adopt zero-emission freight vehicles, and electrify goods movement equipment across the Los Angeles-Long Beach-Anaheim and Riverside-San Bernardino-Ontario MSAs.

Subregional Measures

The subsequent section outlines the state and local GHG reduction measures that CVAG, Unincorporated Riverside County, SBCOG, and WRCOG jurisdictions have incorporated into their municipal or subregional Climate Action Plans, or have indicated a willingness to consider, spanning a range of economic sectors. This section provides a detailed description of local GHG reduction measures as well as implementation considerations, such as implementation agencies, authority to implement, potential funding, staff effort, cost-effectiveness, and implementation milestones. Finally, each section contains an estimate of GHG reduction potential for both state and local measures.

These measures provide a planning framework for the subregions and their respective jurisdictions. Precise implementation and participation may vary across jurisdictions.

CVAG Measures

This section provides a summary of the GHG emissions reductions from state reduction measures and the local GHG emission reduction strategies for CVAG. The analysis includes two socioeconomic scenarios (RIVCOM and DOF as discussed in Chapter 2) and recognizes the challenges of individual cities implementing policies and programs to achieve GHG reductions. The analysis also provides an opportunity for cities to take this foundational analysis and build on it to further advance local climate action.

The first portion of this section summarizes the CVAG GHG quantification analysis for the state measures—a discussion of the measures occurred at the beginning of Chapter 2. Next, is a

⁴⁵ More information about the ARCHES program can be found here: <https://archesh2.org/about/>

discussion of the local measures followed by quantification of the local measures. Last is an analysis of the CVAG cities' GHG emissions relative to GHG targets.

GHG Reduction for State Measures

Table 3-6 summarizes the impact of statewide standards and regulations on CVAG's emissions forecasts for 2030 and 2045. **Figure 3-2** illustrates the combined effect of these forecasts for the subregion. Both **Table 3-6** and **Figure 3-2** include socioeconomic data from the RIVCOM scenario. By 2030, statewide standards and regulations are expected to reduce community emissions by approximately 976,059 MTCO₂e, or an estimated 26 percent from 2023 emission levels. By 2045, statewide measures are expected to reduce community emissions by approximately 2,755,045 MTCO₂e per year, or an estimated 57 percent from 2023 emission levels. As shown in **Table 3-6**, with state-imposed regulations, the emissions are expected to decrease through the year 2045, compared to the BAU forecast that shows an increase over the same period.

Table 3-6 CVAG GHG Reductions from State Measures (MTCO₂e/yr)⁴⁶		
State Measures by Sector	2030 Reduction Potential (Compared to BAU)	2045 Reduction Potential (Compared to BAU)
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	382,721	1,183,507
SB 350 Clean Energy and Pollution Reduction Act	129,755	43,536
Title 24 Building Energy Efficiency Standards	33,684	54,634
California Solar Mandate	18,148	-
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	17,011	38,053
Vehicle Efficiency Standards	269,380	539,428
Advanced Clean Cars II (ACCII)	114,227	850,011
Water		
Water Conservation Mandates	8,138	37,171
Wastewater		
Renewable Electricity in Wastewater Systems	2,994	8,706
Total Reduction from State Measures	976,059	2,755,045

⁴⁶ The GHG reduction values are modeled using the RIVCOM socioeconomic data.

Figure 3-2 CVAG Subregion: Community GHG Emissions After Accounting for State Measures, by Sector (MTCO₂e/year) – All Cities Combined⁴⁷

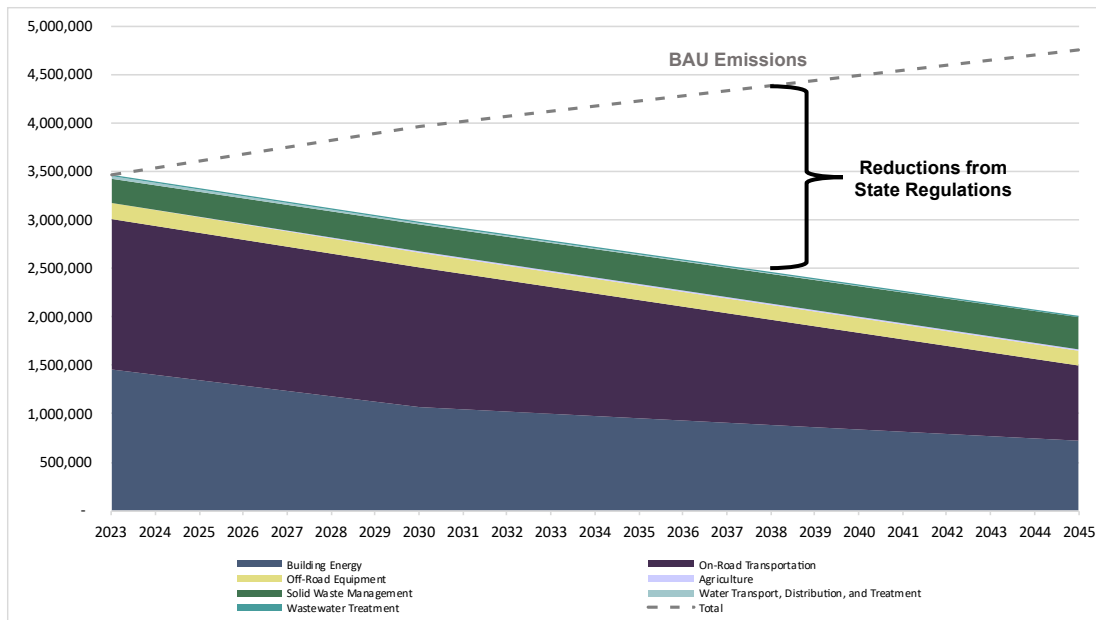


Table 3-7 and **Figure 3-3** show the results of the same analysis described above using socioeconomic data from the DOF scenario. By 2030, statewide standards and regulations are expected to reduce community emissions by approximately 903,908 MTCO₂e, or an estimated 25 percent from the BAU forecast. By 2045, statewide measures are expected to reduce community emissions by approximately 2,284,393 MTCO₂e per year, or an estimated 58 percent from the BAU forecast. Methods used to quantify reductions are included in Appendix B.

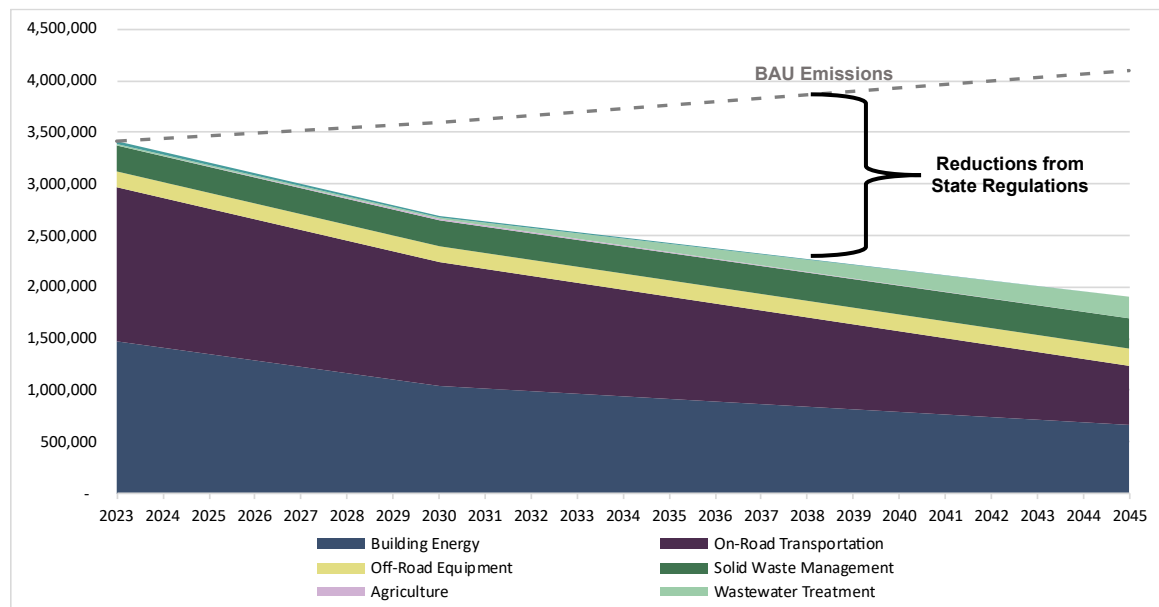
Table 3-7 CVAG GHG Reductions from State Measures (MTCO ₂ e/yr) ⁴⁸		
State Measures by Sector	2030 Reduction Potential (Compared to BAU)	2045 Reduction Potential (Compared to BAU)
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	360,102	1,026,704
SB 350 Clean Energy and Pollution Reduction Act	124,794	28,309
Title 24 Building Energy Efficiency Standards	19,395	54,634
California Solar Mandate	31,577	-
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	13,583	43,692
State On Road-I: Vehicle Efficiency Standards	245,337	478,102
Advanced Clean Cars II (ACCII)	99,750	716,686
Water		

⁴⁷ The GHG reduction values are modeled using the RIVCOM socioeconomic data.

⁴⁸ The GHG reduction values are modeled using the DOF socioeconomic data.

Table 3-7 CVAG GHG Reductions from State Measures (MTCO ₂ e/yr) ⁴⁸		
Water Conservation Mandates	6,904	29,639
Wastewater		
Renewable Electricity in Wastewater Systems	2,466	6,627
Total Reduction from State Measures	903,908	2,384,393
Note: Totals may not add up due to rounding.		

Figure 3-3 CVAG Subregion: Community GHG Emissions After Accounting for State Measures, by Sector (MTCO₂e/year) – All Cities Combined⁴⁹



Local Measures

This section summarizes the local GHG reduction measures for CVAG by sector: Energy, On-Road Transportation, Off-Road Transportation, Solid Waste, Agriculture, Water, and Wastewater. The “Accounting for Local Measures” and “Meeting GHG Reduction Target” subsections summarize GHG reduction potential for local measures and lists the cities that selected each measure.

Local Measures – Energy

Energy-1: 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

⁴⁹ The GHG reduction values are modeled using the DOF socioeconomic data.

use HVAC and water heating systems. It assumes that all new residential buildings will be 100% electric in 2030 and 2045. For new commercial buildings, this measure assumes that 75 percent of buildings will be all-electric. For both existing commercial and residential buildings, 10 percent of buildings are assumed to be all-electric. This goal could be supported through nonfinancial incentives or streamlined permitting.

Energy-2: LED Bulbs and Fixtures

Replace interior and exterior incandescent, compact fluorescent, halogen, and T12 linear fluorescent bulbs.

The adoption of this measure would require jurisdictions to adopt ordinances that require new developments to use 100% LED lighting and develop incentive programs to encourage homeowners and businesses to switch their lightbulbs to be more energy efficient. By adopting this measure, jurisdictions can lower electricity consumption through upgrades in energy efficient lightbulbs. By 2025, California is eliminating the sale of most incandescent, halogen, and fluorescent products and it is therefore assumed that 95 percent of all residential lighting and 15 percent of commercial lighting will be non-LED in 2030. This drops to one percent and five percent for residential and commercial lighting respectively in 2045.

Energy-3: Smart Thermostat

Install occupant controlled smart thermostats for buildings with central heating and cooling systems.

This measure would require jurisdictions to promote and encourage the adoption of smart thermostats. Smart thermostats can reduce energy consumption because they gather data and adjust the temperature of homes and other buildings based on occupancy and inhabitants' preferences, leading to a reduction in GHG emissions. This goal could be supported through financial incentives and jurisdictions can work with utilities and residents to raise awareness about the benefits of installing a smart thermostat.

Energy-4: Appliance Electrification Upgrades

Replace and install inefficient electric appliances with Energy Star appliances.

This measure would require jurisdictions to promote and encourage residents to replace inefficient electric appliances with Energy Star appliances, including refrigerators, dishwashers, washing machines, and ceiling fans. On average, single-family homes can see a 2 percent decrease in overall energy emissions and multifamily homes will reduce energy emissions by nearly 3.5 percent by installing Energy Star appliances. This goal could be supported through financial incentives and awareness raising campaigns.

Energy-5: Solar Window Film

Install solar window film certified by the National Fenestration Rating Council on single and multifamily homes and commercial buildings.

Solar window film can help to keep buildings cooler because it reduces solar heat gain, which in turn lowers the demand on cooling systems and increases overall energy efficiency. On average, air conditioning is responsible for 13 percent of total household energy consumption. Solar window film is estimated to increase cooling cost savings by 30 percent. This measure assumes

that 15 percent of all buildings will have solar window film by 2030 and 25 percent will install it by 2045.

Energy-6: Cool Roofs

Install and retrofit roofs with cool roofs to reduce urban heat island effects and lower energy consumption.

Substituting traditional roofing 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.

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.

Energy-7: Roofline Insulation and Attic Encapsulation

Insulate roof rafters to improve energy efficiency in existing homes.

Inadequate insulation in attics or roof spaces allows heat to escape during winter months and heat to enter during warm months, leading to higher energy bills, discomfort, and potentially damage the roof structure itself. Roof insulation is an effective way to reduce heat loss and improve energy efficiency and can include interventions such as blanket insulation, rigid insulation boards, and spray foam insulation. A key aspect of improving roofline insulation is proper installation and regular maintenance to check for signs of damage or deterioration. Local jurisdictions may offer incentives, such as rebates, to encourage roof insulation upgrades.

Energy-8: HVAC Maintenance Program

Create an HVAC tune-up program to ensure that HVAC systems are operating at their maximum efficiency level.

HVAC systems consume about 26 percent of residential energy use and nearly 42 percent of commercial building energy use and are therefore critical to increasing energy efficiency. Regular maintenance of HVAC systems offers many benefits, including improved energy efficiency, indoor comfort, enhanced air quality and extended lifespan. An HVAC tune-up is a preventative maintenance service performed by qualified technicians to ensure HVAC systems are functioning efficiently and to optimize the system's performance. Local jurisdictions can partner with utilities, nonprofits, or other organizations to develop an HVAC tune-up program. This initiative also has the potential to be financed through programs such as 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. The Inland Regional Energy Network (IREN) is an additional resource that can connect local governments with residents and small businesses and provide support for implementing measures such as the HVAC maintenance program.

Energy-9: Solar Installations for New Commercial and Industrial Development

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

Installing solar panels on new commercial and industrial buildings boosts renewable energy production and reduces GHG emissions. This measure encourages businesses to use Power Purchase Agreements or other low-cost options for rooftop solar installation. Jurisdictions adopting this measure set a 2030 goal for 15 percent of energy requirements for new development supplied by onsite solar power and 2045 goal of 30 percent.

These goals could be achieved with nonfinancial incentives or streamlined permitting. Primary funding would come from state or utility programs, or private sources like a Power Purchase Agreement (PPA). Jurisdictions can help connect project proponents to funding opportunities. Title 24, which became effective January 1, 2023, requires all new non-residential building projects to install solar PV and energy storage. To ensure projects are in accordance with Title 24, contractors are required to include solar installations in new non-residential construction, which will also support progress on this measure.

Energy-10: On-site Solar Energy for New and Existing Warehouse Space

Promote and incentivize solar installations.

This measure aims to increase solar installations on existing and new warehouse spaces through collaborations with Southern California Edison and other private sector funding sources, such as SunRun, Tesla, and other solar lease or PPA companies. To implement this measure, jurisdiction governments can collaborate with private companies and utilities to secure funding for solar energy projects. The implementation of this measure would be gradual through 2045, as new warehouse spaces are constructed and equipped with solar installations, and existing warehouse spaces are retrofitted. This measure also recommends that jurisdiction governments set a goal for 40 percent of existing and new warehouse roof space to install solar panels. 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.

Energy-11: Solar Installations for Existing Homes

Increase solar installations on existing single-family homes.

This measure aims to set targets for solar installations on existing single-family homes to be achieved by 2030 and 2045. Specifically, it targets 20 percent of homes installing solar by 2030 and 30 percent by 2045. These objectives may be supported through non-financial incentives or streamlined permitting processes within the jurisdictions. Primary funding is anticipated to come from state-level or utility-level programs or private investments such as Power Purchase Agreements (PPA). Jurisdictions might also serve as a resource in connecting project proponents with funding opportunities. To facilitate the implementation of this measure, jurisdiction governments can collaborate with private companies to secure funding for solar energy initiatives. This measure will be implemented progressively through 2045 as new single-family residential developments are constructed and equipped with solar installations.

Energy-12: Solar Installations for Existing Commercial and Industrial Buildings***Establish a goal for solar installations on existing commercial and industrial buildings.***

Governments in various jurisdictions are setting ambitious targets for solar installations on existing commercial and industrial buildings to be achieved by 2030 and 2045. The implementation goals are set at 20 percent by 2030 and 30 percent by 2045. These objectives may be partially fulfilled through private funding from companies such as SunRun, Tesla, or other solar lease PPAs. Furthermore, nonfinancial incentives and streamlined permitting processes at the local level can facilitate the achievement of these targets. Jurisdictions could also serve as resources for connecting property owners with funding opportunities.

This initiative is designed to complement the voluntary CALGreen measures related to solar photovoltaic systems. To successfully implement this measure, governments in various jurisdictions can collaborate with building owners, state funding programs, and private enterprises to secure financing for solar energy projects. The rollout of this measure will progress gradually through 2045 as solar systems are installed on existing structures.

Table 3-8
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e) ^f	Implementation Milestones
Energy-1	Building Electrification	Indian Wells, Indio, Palm Desert, Palm Springs	The authority to implement this measure rests with local planning and building departments, state energy agencies, and utility programs. - Planning departments can adopt ordinances requiring building electrification of new developments - State agencies like the California Energy Commission set building energy standards under Title 24 Utilities may offer incentives for residential and commercial upgrades under energy efficiency programs regulated by the California Public Utilities Committee.	Federal: - DOE - HHS - HUD - IRS State: - CEC - CPUC - HCD Regional: - SCE - SoCalRen	High	Ranges from net benefit to <\$1,000 MTCO ₂ e ^f	Priority 3: - Draft in 2028 - Adopt in 2029
Energy-2	LED Bulbs and Fixtures	Blythe, Cathedral City, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	Local governments have the primary implementation authority in LED lighting upgrades. Building departments may establish or enforce lighting standards in new construction and major renovations; sustainability offices may run rebate or direct-install programs; and utilities can provide incentives for LED upgrades under energy efficiency programs regulated by the CPUC.	Regional: - SCE - SoCalRen	Low	Net Benefit ^d	Priority 1: - Draft in 2026 - Adopt in 2027
Energy-3	Smart Thermostat	Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	Local jurisdictions, including sustainability offices, have the authority to promote and encourage smart thermostats working with utilities and where grant funding is identified, cities can implement incentives.	Regional: - SCE - SoCalGas - SoCalRen	Low	Net Benefit ^d	Priority 1: - Draft in 2026 - Adopt in 2027

Table 3-8
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-4	Appliance Electrification Upgrades	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	Authority to implement appliance electrification upgrades rests with local planning or building departments, sustainability offices, and utility programs. Planning and building departments issue permits and ensures code compliance for appliance replacements, local governments may also offer incentives or bulk purchasing program, and utilities could provide rebates and technical support for electrification upgrades.	Federal: • DOE • HHS • HUD • IRS State: • CEC • CPUC • HCD Regional: • SCE • SoCalGas • SoCalRen	Low	<\$200 per MTCO ₂ e ^d	Priority 1: • Draft in 2026 • Adopt in 2027
Energy-5	Solar Window Film	Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	The authority to implement programs that increase the use of solar window film lies with cities. Building departments may include window film as part of energy efficiency compliance in renovation and local governments can promote adoption through outreach and incentives. Where grant funding is identified, cities can implement incentives for existing/new development.	Regional: • SCE • SoCalGas SoCalRen	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028
Energy-6	Cool Roofs	Blythe, Cathedral City, Desert Hot Springs, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	The authority to implement cool roofs lies with local cities and their building or planning departments. Locally, building departments enforce T24 cool roof requirements and planning departments may adopt ordinances that encourage cool roofs. At the state level, state energy agencies set performance standards for roofing materials.	Regional: • SCE • SoCalREN	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-8
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-7	Roofline Insulation and Attic Encapsulation	Indian Wells, Indio, Palm Springs, Rancho Mirage	Authority for roofline insulation and attic encapsulation lies with Building Departments, local weatherization programs, and utility energy efficiency initiatives. Building departments ensure compliance with insulation standards during construction and retrofits; local governments may offer weatherization assistance for low-income households; and utilities provide rebates for insulation upgrades under CPUC-regulated programs.	State: • CEC • CPUC • CSD • HCD Regional: • SCE • SoCalGas • SoCalRen	Medium	Net Benefit to <\$1,000 per MT CO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
Energy-8	HVAC Maintenance Program	Desert Hot Springs, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	Cities have the authority to implement and administer HVAC maintenance programs in partnership with utility energy efficiency programs. Local governments may promote regular maintenance through outreach or incentive programs and utilities offer rebates for tune-ups and diagnostics.	Federal: • DOE • HHS • HUD • IRS State: • CEC • CPUC • HCD Regional: • SCE • SoCalGas • SoCalRen	Low	Net Benefit to <\$1,000 per MT CO ₂ e ^f	Priority 1: • Draft in 2026 • Adopt in 2027

Table 3-8
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-9	Solar Installations for New Commercial and Industrial Development	Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	Authority to implement solar installations in new commercial and industrial projects rests with Planning Departments, Building Departments, and state energy agencies. Planning Departments can adopt ordinances requiring solar readiness or installations in new developments; Building Departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE State: • CPUC Regional: • SCE	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	Desert Hot Springs, Indio, Palm Desert	Implementation authority includes Planning Departments, Building Departments, and local sustainability offices. Planning Departments may designate zoning or incentives for solar installations on warehouse rooftops; Building Departments oversee permitting and code compliance; and local governments may promote adoption through outreach or green building programs.	Federal: • DOE State: • CPUC Regional: • SCE	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-8
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-11	Solar Installations for Existing Homes	Blythe, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	The authority to implement and expand solar installations in existing homes rests with building departments to issue permits and inspect installations. and state energy agencies. Planning Departments can adopt ordinances requiring solar readiness or installations in new developments; Building Departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE • IRS State: • CSD • CPUC Regional: • CPA • SCE	Low	Net Benefit ^d	Priority 1: • Draft in 2026 • Adopt in 2027
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	The authority to implement and expand solar installations in existing commercial and industrial buildings rests with building departments to issue permits and inspect installations. and state energy agencies. Planning departments can adopt ordinances requiring solar readiness or installations in new developments; building departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE State: • CPUC Regional: • SCE	Low	Net Benefit ^d	Priority 1: • Draft in 2026 • Adopt in 2027
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Local Measures – On-Road Transportation

On-Road-1: Increase Housing Density

Increase the density of planned housing units within the region.

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 On-Road 12 and On-Road 13 that promote land use diversity and transit-oriented development. Implementation of this measure would include nonfinancial incentives, which could include streamlined permitting and density requirements. Housing developers would be targeted by local government planning action.

On-Road-2: Increase Land Use Diversity

Provide 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.

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. Similar to On-Road-11, this measure would include nonfinancial incentives, which could include streamlined permitting and development requirements. Developers would be targeted by local government planning action.

On-Road-3: Light-Duty Electric Vehicle Infrastructure

Expand the availability of publicly accessible EV charging stations throughout the region.

This measure supports the regional uptake of zero emission vehicles (ZEVs) through expansion of supporting infrastructure, including EV charging and hydrogen refueling stations. Potential implementation 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.

This measure would necessitate installations on private property that would be accessible to the public. To successfully implement this measure, it would require funding, which would come from state or utility programs, or private sources like electric vehicle companies. Jurisdictions can help connect project proponents to funding opportunities.

On-Road-4: Pedestrian Infrastructure Improvements

Expand and improve pedestrian infrastructure.

Similar to 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.

These goals could be achieved with nonfinancial incentives or streamlined permitting. To facilitate the implementation of this measure, local governments will need to develop Active Transportation Plans, Safe Routes to School Plan, and/or similar plans. This could be improved through funding mechanisms, although financing is not entirely necessary for the rollout of this measure. Through implementation of these plans, local governments can construct sidewalks, crosswalks, curb ramps, pedestrian signals, or pedestrian crossings, and create pedestrian only spaces within public areas.

On-Road-5: Bicycle and Micromobility Infrastructure Improvements

Expand on-street and off-street bicycle and micro-mobility infrastructure.

By providing more bicycle lanes and better connections between existing bicycle lanes, participating jurisdictions can increase the viability of bicycling and other micromobility transportation as an emission-free commute option. Micromobility vehicles include electric and human-powered scooters, bicycles and wheeled conveyances. Several CVAG jurisdictions have adopted or are preparing bicycle master plans, active transportation plans, or safe routes to school plans, including the CV Link project, 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. In addition, there are community health benefits from increased bicycling, which include improved air quality and exercise. Both financial and non-financial incentives, as well as

streamlined permitting processes for related infrastructure at the local level can facilitate the implementation of this measure.

On-Road-6: Transition City and Agency Fleets to Zero Emission Vehicles

Purchase low- or zero-emission vehicles.

Transitioning local government vehicle fleets to ZEVs would reduce municipal emissions of local jurisdictions. Cities and agencies can adopt vehicle transition plans that incorporate ZEV purchases into current fleet retirement/replacement plans. Part of this fleet electrification measure is for municipalities to define clear targets, timelines, and strategies for integrating charging infrastructure, budget allocation, personnel training, and updates to vehicle procurement policies. To implement this measure, local governments will need to secure funding through state or private programs both for vehicles and associated charging infrastructure.

On-Road-7: Increase Transit Service and Frequency

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

This measure focuses on collaborating with local and regional transit providers to increase volume and frequency of transit service in the subregion, including more implementation of bus rapid transit. 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. In order to implement this measure, governments in various jurisdictions can collaborate with transit agencies to access state and local funding programs.

On-Road-8: Transit Oriented Development

Place new developments near 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 bus station or a fixed-route bus with headways of 15 minutes or less during peak commute hours. This measure would include nonfinancial incentives, which could include streamlined permitting and development requirements. Developers would be targeted by local government planning action.

On-Road-9: Transportation Demand Management

Implement TDM strategies and programs.

This strategy reflects the regional share of transportation demand management (TDM) strategies that may be implemented on a regional level. 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.

With teleworking becoming increasingly viable for companies and for workers, this measure is likely to become widely popular for occasional commuting, and other related programs in the subregion may also develop. To implement this measure, funding is not necessarily required. Alternatively, the shared fleet of vehicles and carpool programs could be provided by private institutions or companies as a service to its employees, residents, or students.

On-Road-10: Parking Pricing and Limited Requirements

Price public parking in central business districts, employment centers, and retail centers. Reduce requirements for vehicle parking in new development projects.

This measure would include limiting parking requirements for new development in certain areas, which may encourage alternative individual transportation choices. 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.

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.

On-Road-11: Traffic Signal Coordination

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

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.

Implementation necessitates public works improvement and transportation planning efforts from local governments. Planning can be streamlined through funds allocated towards technological improvements, from public or private sources. For example, the City of Coachella identified deploying Intelligent Transportation Systems as a measure to improve traffic flow and lower transportation emissions.

Table 3-9
CVAG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO _{2e})	Implementation Milestones
On-Road-1	Increase Housing Density	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	City Planning Departments are the lead agencies for zoning changes, land use amendments, and housing element updates. They have the authority to amend zoning codes to allow higher density, streamline permitting processes, implement nonfinancial incentives like density bonuses and reduced parking requirements. They can also steer development through specific plan updates and General Plan amendments. At the state level, California Department of Housing and Community Development (HCD) oversees compliance with housing element law and RHNA (Regional Housing Needs Allocation) requirements. HCD enforces housing laws and can revoke housing element certification if jurisdictions fail to comply. HCD also administers funding programs like the Infill Infrastructure Grant Program and Affordable Housing and Sustainable Communities Program. Regional Councils of Government (COGs) help allocate RHNA targets and coordinate regional planning efforts. COGs work with HCD to ensure housing elements reflect regional needs and climate goals.	Federal: • HUD State: • SCG • HCD	High	\$201 to \$999 per MTCO _{2e} ^f	Priority 1: • Draft in 2026 • Adopt in 2027
On-Road-2	Increase Land Use Diversity	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	Local government planning departments have the authority to: • update General Plans and Specific Plans to allow mixed-use development; • amend zoning codes to permit a broader range of uses in targeted area; • streamline permitting processes for infill and mixed-use projects; • offer nonfinancial incentives like reduced parking requirements or expedited review Most land-use changes in California are subject to public input and CEQA review but can be streamlined for some infill and mixed-use projects under certain conditions development projects. They	Federal: • HUD State: • SCG • HCD	High	>\$1000 per MTCO _{2e} ^f	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-9
CVAG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
			must also be approved or adopted by City Councils and Boards of Supervisors.				
On-Road-3	Light-Duty Electric Vehicle Infrastructure	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	The authority to expand publicly accessible EV charging infrastructure—including ordinances, permitting, and incentives—rests with a combination of local departments, state agencies, and utility partnerships. Within local governments, Planning Departments can adopt ordinances requiring EV infrastructure in new developments and designate zoning for EV-friendly uses; Building and Safety Departments are typically responsible for issuing permits and conducting inspections for EV charging installations; and Public Works or Transportation Departments may manage public right-of-way installations, parking designations, and fleet electrification. AB 1236 (2015) and AB 970 (2021) require all California cities and counties to adopt streamlined permitting ordinances for EV charging stations.	Federal • NEVI program State: • SCE • CARB • CEC's Clean Transportation Program⁵⁰ • CEC's CALeVIP⁵¹ Regional: • IREN/Clean Cities	Medium	Ranges from net benefit to >\$1000 per MTCO ₂ e ^a	Priority 1: • Draft in 2026 • Adopt in 2027
On-Road-4	Pedestrian Infrastructure Improvements	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	Local governments in California have authority over land use. Planning Departments play a key role in aligning infrastructure improvements with broader land use and climate goals, and in developing municipal codes, pilot programs, and permitting processes that may be needed for implementation; Public Works Departments often lead the design and construction of pedestrian corridors and related street improvements; Transportation Departments (or divisions within Public Works) are responsible for planning and managing active transportation systems, including sidewalks and pathways, traffic calming, and other safety measures.	Federal: • US DOT State: • Caltrans • CalSTA Regional • SBCTA, CVAG, WRCOG	Medium	\$201 to \$999 per MTCO ₂ e ^c	Priority 1: • Draft in 2026 • Adopt in 2027
On-Road-5	Bicycle and Micromobility Improvements	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm	Local governments in California have authority over land use. Planning Departments play a key role in aligning infrastructure improvements with broader land use and climate goals, and in developing	Federal: • US DOT State: • Caltrans	Medium	\$201 to \$999 per MTCO ₂ e ^c	Priority 2: • Draft in 2027 • Adopt in 2028

⁵⁰ <https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program>

⁵¹ <https://calevip.org/about-calevip>

Table 3-9
CVAG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
		Desert, Palm Springs, Ranch Mirage	municipal codes, pilot programs, and permitting processes that may be needed for implementation; City Planning, Public Works, and Transportation Departments. Public Works Departments often lead the design and construction of bicycle lanes and micromobility infrastructure (like e-scooter parking zones), and related street improvements; Transportation Departments (or divisions within Public Works) are responsible for planning and managing mobility systems, including bike lanes, traffic calming, and micromobility integration.	- CalSTA - Regional - CVAG			
On-Road-6	Transition City and Agency Fleets to Zero Emission Vehicles	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	The authority to transition city owned and managed fleets rests within the local government itself.	Federal - NEVI program State: - SCE - CARB - CEC's Clean Transportation Program⁵² - CEC's CALeVIP⁵³ Regional - IREN/Clean Cities	Medium	Ranges from net benefit to >\$1000 per MTCO ₂ e ^f	Priority 1: - Draft in 2026 - Adopt in 2027
On-Road-7	Increase Transit Service and Frequency	Indian Wells	Generally, the authority to increase transit service and frequency is shared among local city departments, local and regional transit services, regional transportation authorities, and state-level agencies. In Western Riverside County, Riverside Transit Agency (RTA) develops Short Range Transit Plans (SRTPs) to guide service improvements and expansions. It also operates regional transit services and coordinates with municipal transit systems in cities like Corona, Beaumont, Banning, and Riverside. The Riverside County Transportation	Federal: - US DOT - IIJA State: - CARB - CalTrans - CalSTA	High	Ranges from net benefit to >\$1000 per MTCO ₂ e ^f	Priority 1: - Draft in 2026 - Adopt in 2027

⁵² <https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program>

⁵³ <https://calevip.org/about-calevip>

Table 3-9
CVAG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
			Commission (RCTC) manages funding, planning, and coordination across agencies and jurisdictions. RCTC manages Measure A funds and SB 1 allocations. ⁵⁴				
On-Road-8	Transit Oriented Development	Indian Wells	Similar to increasing Land Use Diversity, Local government planning departments have the authority to: • amend General Plans, Specific Plans, and Zoning Codes to allow TOD. • define high-quality transit areas • streamline permitting and offer nonfinancial incentives to developers • require TOD-supportive design features like pedestrian access, bike infrastructure, and reduced parking Most land-use changes in California are subject to public input and CEQA review but can be streamlined for some infill and mixed-use projects under certain conditions development projects. They must also be approved or adopted by City Councils and Boards of Supervisors.	Federal: • HUD State: • SCG • HCD • Caltrans	High	Ranges from net benefit to >\$1000 per MTCO ₂ e ^f	Priority 1: • Draft in 2026 • Adopt in 2027
On-Road-9	Transportation Demand Management	Indian Wells	City Public Works or Transportation Departments typically lead TDM efforts, which include carpool and car share programs. Responsibilities can range from managing parking supply and prioritizing carpool and clean vehicle spaces, implementing ordinances that incentivize developers to include car share vehicles and memberships in new developments, and supporting pilot programs for carsharing in multifamily housing.⁵⁵	State: • CalTrans Regional • CVAG	Medium	>\$1000 per MTCO ₂ e ^d	Priority 1: • Draft in 2026 • Adopt in 2027
On-Road-10	Parking Pricing and Limited Requirements	Palm Springs	City Planning Departments lead the development and enforcement of zoning codes and parking requirements. They can set maximum parking limits for new developments, require unbundled parking (separating parking costs from rent), and implement	Regional • CVAG	High	\$201 to \$999 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028

⁵⁴ How RCTC Funds and Plans Local Transit Improvement - RCTC

⁵⁵ Trip Reduction & TDM | Cool California

Table 3-9
CVAG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO _{2e})	Implementation Milestones
			parking cash-out programs and Transportation Demand Management (TDM) policies. City Public Works or Transportation Departments typically manage parking infrastructure, including meters, curb space, and permit programs.				
On-Road-11	Traffic Signal Coordination	Palm Springs	Implementation is shared among local city departments, Riverside County Transportation Commission (RCTC), and Caltrans depending on jurisdiction and roadway ownership.	Federal: • US DOT State: • CalTrans	Medium	\$201 to \$999 per MTCO _{2e} ^f	Priority 1: • Draft in 2026 • Adopt in 2027
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Local Measures – Off-Road Transportation

Off-Road-1: Construction Equipment Electrification

Encourage the electrification of construction equipment.

This measure entails the electrification of warehouse cargo-handling equipment, transitioning to zero-emission offroad equipment including locomotives and switchers, and establishing a goal for construction equipment to utilize electricity as power rather than natural gas. Implementing this measure would require close coordination with the air district that sets requirements related to air quality on construction vehicles and would also require providing mitigation options related to construction vehicles through Voluntary Emission Reduction Agreement (VERA) programs that could overlap with this measure. Regional air districts have mitigation programs for air quality that focus on construction equipment and sometimes have funding to assist with equipment swap-out, jurisdictions choosing this measure would benefit from coordinating with the air districts in implementing this measure.

Off-Road-2: Lawn and Garden Equipment Electrification

Encourage the electrification of landscaping equipment.

This measure entails the electrification of landscaping equipment. It may involve local governments adopting an ordinance that reduces gasoline or diesel-powered landscaping equipment use and offers incentives and/or rebates for replacing fossil-fueled equipment with electric-powered equivalents. The regional air districts offer residential and commercial lawn and garden equipment rebate programs for qualifying equipment. Jurisdictions choosing this measure would benefit from coordination with the air districts in implementing this measure.

Table 3-10
CVAG Off-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Off-Road-1	Construction Equipment Electrification	Desert Hot Springs, Indian Wells	The authority to implement the electrification of construction equipment, including ordinances, permitting, and incentives—rests with a combination of local departments and state agencies. Within local governments, Planning Departments can adopt ordinances requiring new construction equipment be electric, to phase out natural gas- and diesel-powered equipment. State agencies, including CalTrans and the Air District, could also oversee implementation.	State: • CARB • CalTrans Regional • SCAQMD • SBCTA, CVAG, WRCOG	Low	\$201 to \$999 per MTCO ₂ e ^c	Priority 1: • Draft in 2026 • Adopt in 2027
Off-Road-2	Lawn and Garden Equipment Electrification	Desert Hot Springs, Indian Wells, Palm Springs	The authority to implement the electrification of lawn and garden equipment, including ordinances, permitting, and incentives lies within local governments. Planning Departments can adopt ordinances requiring new lawn and garden equipment be electric.	State: • CARB Regional • SCAQMD	Low	\$201 to \$999 per MTCO ₂ e ^c	Priority 2: • Draft in 2027 • Adopt in 2028
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Local Measures – Solid Waste

Waste-1: SB1383 Short-Lived Climate Pollutants Organic Waste Recycling

Reduce methane pollution and other short-lived climate pollutants by reducing organic waste by 75 percent.

SB 1383 is a statewide mandate that requires every jurisdiction to provide organic waste collection. Organic waste refers to food, green material, landscape and pruning waste, organic textiles and carpets, lumber, wood, paper products, printing and writing paper, manure, biosolids, digestate, and sludges. Organic waste in landfills is responsible for nearly 20 percent of the state's methane emissions. Reducing the volume of organic waste sent to landfills will contribute significantly to decreasing overall methane emissions. This legislation requires that 75 percent of organic waste be diverted to composting. Since jurisdictions are responsible for implementing SB 1383, it is accounted for as a local measure.

Waste-2: Construction and Demolition Waste Diversion

Adopt a construction and demolition waste recovery ordinance that meets or exceeds the CALGreen voluntary guidance of 65-75 percent reduction in nonhazardous waste.

This measure would encourage CVAG jurisdictions to adopt local ordinances to ensure that CVAG is on track to meet or surpass the 65-75 percent reduction of nonhazardous waste based on the CALGreen construction waste management requirements. Construction and demolition generate significant amounts of waste, most notably lumber waste. Repurposing construction waste can help to prevent decay in landfills and be recycled into new products. For example, nonhazardous lumber waste can be reused in other building projects or be recycled as mulch or compost. The implementation of this ordinance will require close collaboration with stakeholders to ensure contractors, property managers, and workers are aware of the need to reduce nonhazardous waste and have the resources and knowledge to comply with the target. Encouraging contractors to develop waste management plans and take detailed accounts of their waste disposal, will increase accountability and prioritization of waste reduction.

Waste-3: Solid Waste Diversion

Adopt citywide waste goals to divert waste, support zero waste programs and education, and implement recycling and composting in multifamily buildings.

This measure establishes jurisdiction-wide goals to divert solid waste by 80 percent by 2045. This goal can be supported by a multipronged approach including waste diversion education for residents, supporting zero waste programs and circular economy initiatives, and providing resources to implement recycling and composting in multifamily buildings. This measure would involve a community-wide approach and help to develop a sense of ownership for improving recycling and composting, making individuals more likely to implement these initiatives.

Waste-4: Food Waste Diversion

Establish a food waste and organics diversion goal. Pilot a food share/food recovery program.

Food waste diversion refers to changing practices that lead to the disposal of methane-generating biodegradable waste. This measure would establish a 30 percent food waste diversion goal by 2030. The aim of this goal is to reduce the amount of food waste that end up in landfills by developing food share and/or food recovery programs to save edible food from being sent to landfills. Food recovery programs reduce food waste and GHG emissions in tandem with reducing food insecurity.

Table 3-11
CVAG Solid Waste Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Waste-1	SB1383 Short-Lived Climate Pollutants Organic Waste Recycling	Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	City, county, or special districts that provide solid waste collection services have authority to implement organic waste collection services and choose the type of collection systems that best suits the community. Sustainability offices may also educate residents and businesses about waste reduction and recycling.	CalRecycle	Medium	> \$1,000 per MTCO ₂ e ^d	Priority 2: - Draft in 2027 - Adopt in 2028
Waste-2	Construction and Demolition Waste	Blythe, Coachella, Desert Hot Springs, Indio, La Quinta, Palm Desert	Jurisdictions may implement ordinances to encourage responsible construction and demolition waste practices. Local building departments enforce C&D waste diversion ordinances and require waste management plans as a part of the permitting process. Solid waste collection services and state agencies provide guidance on reuse and recycling standards.	CalRecycle	Low	> \$1,000 per MTCO ₂ e ^d	Priority 1: - Draft in 2026 - Adopt in 2027
Waste-3	Solid Waste Diversion	Blythe, Cathedral City, Desert Hot Springs, Indio, La Quinta, Palm Desert	City, county, or special districts that provide solid waste collection services have authority to implement waste diversion programs. Sustainability offices may also educate residents and businesses about waste reduction and recycling. CalRecycle also sets statewide diversion goals under laws such as SB 1383.	CalRecycle	Medium	> \$1,000 per MTCO ₂ e ^d	Priority 2: - Draft in 2027 - Adopt in 2028
Waste-4	Food Waste Diversion	Blythe, Cathedral City, Desert Hot Springs, Indio, Palm Desert	Cities have the authority to implement local food waste diversion programs in partnership with nonprofits and food banks to support food recovery infrastructure and outreach.	N/A	Medium	Net Benefit ^e	Priority 2: - Draft in 2027 - Adopt in 2028

Notes:

- CAPCOA Handbook, 2024
- City of Coronado CAP, 2022
- Sacramento County CAP, 2024
- San Bernardino County Regional GHG Reduction Plan Update, 2022
- San Diego County CAP, 2024
- Derived from multiple sources

Potential Funding:

See Appendix D for a full list of acronyms and funding programs.

Local Measures – Agriculture

Agriculture-1: Urban Tree Planting

Promote urban tree planting for shading and energy savings by establishing a city-wide tree planting 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.

Agriculture-2: Local Agriculture and Community Gardens

Support local farms, community gardens, and sustainable food production

This measure supports local farms, community gardens, and promotes sustainable food production within the CVAG. Consuming local produce not only promotes healthy and vegetarian diets but also reduces GHG emissions related to transporting food long distances. Increasing opportunities to connect consumers to local producers is a priority of this measure. Partnerships with farmers markets and grocery stores are vital to supporting local farms. This measure will promote community awareness about opportunities to buy local produce and make food accessible and affordable. In fact, CalFresh/EBT is accepted at CVAG farmers markets. This makes clean, healthy produce accessible to low-income communities and supports local producers as well. Community gardens are another avenue to bring local produce to people's homes and reduce dependence on food from far distances.

Table 3-12
CVAG Agriculture Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Agriculture-1	Urban Tree Planting	Blythe, Coachella, Cathedral City, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	Authority to implement urban tree planting programs rests with local jurisdictions and departments such as public works, parks and recreation, planning, or sustainability. Local jurisdictions have the authority to develop plans and policies that support urban forestry. Planning departments have authority over municipal codes or development standards that can encourage tree planting in new/existing developments.	State: - Cal Fire - CNRA	Medium	\$201 - \$999 per MTCO ₂ e ^d	Priority 2: - Draft in 2027 - Adopt in 2028
Agriculture-2	Local Agriculture and Community Gardens	Blythe, Cathedral City, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	Under AB 551, also known as the Urban Agriculture Incentive Zones Act, cities and counties can provide tax relief to landowners who agree to use vacant land for small-scale agricultural production. Parks departments also have the authority to allocate public land and provide infrastructure support for community gardens.	State: - CFDA - CNRA	Medium	N/A – GHG reduction not quantified	Priority 2: - Draft in 2027 - Adopt in 2028

Notes:

- CAPCOA Handbook, 2024
- City of Coronado CAP, 2022
- Sacramento County CAP, 2024
- San Bernardino County Regional GHG Reduction Plan Update, 2022
- San Diego County CAP, 2024
- Derived from multiple sources

Potential Funding:

See Appendix D for a full list of acronyms and funding programs.

Local Measures – Water and Wastewater

Wastewater-1: Equipment Upgrades

Upgrade and replace wastewater treatment and pumping equipment to be more energy efficient.

This measure could include the adoption of the voluntary CALGreen water efficiency measures for existing construction. CALGreen voluntary measures recommend use of certain water-efficient appliances, plumbing and irrigation systems, as well as more aggressive water-savings targets. In addition, it could include the update of building standards and codes for existing residential and nonresidential buildings to require adoption of these voluntary measures. Adopting these equipment upgrades could lead to reduced energy use, reduced air pollution, resource conservation, and even increased property values of homes. Implementation of this measure falls under the purview of jurisdiction governments, as they can choose to include the voluntary CALGreen measures in their building codes. Thus, there would not be a financial component to implementation.

Water-1: Increase Recycled Water Use

Expand the available water supply through water recycling and increasing 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.

Water-2: Water Conservation

Expand and enforce existing water conservation ordinances and educate the public on water conservation.

This measure promotes increased awareness and education regarding water usage and conservation, coupled with the expansion and enforcement of existing water conservation policies. There are a range of ways that community members can decrease their water consumption such as installing efficient landscaping, growing plants that are adapted to the weather, and efficiently watering plants. Rainwater and stormwater can also be collected for watering plants as well. Since almost half of water consumed in the State is used for the outdoors, there is a great opportunity to educate communities and significantly decrease this.

Table 3-13
CVAG Water and Wastewater Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e ^e)	Implementation Milestones
Wastewater-1	Equipment Upgrades	Blythe, Indian Wells, Indio	The local agency or department that owns and operates the wastewater treatment plant (e.g., a city's Public Works Department or a sanitation district) has the direct authority to plan and implement equipment upgrades. These agencies can apply for funding or technical support through utilities or other agencies such as SoCalREN and CEC, or other state programs.	Regional • SoCalREN	Low	\$201 to \$999 per MTCO ₂ e ^e	Priority 1: • Draft in 2026 • Adopt in 2027
Water-1	Increase Recycled Water Use	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert	Where grant funding or partnership with utilities is identified, cities can implement incentives to increase recycled water use both by consumers and water purveyors.	Regional • SBCTA, CVAG, WRCOG • SoCalREN	Medium	\$201 to \$999 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
Water-2	Water Conservation	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert, Rancho Mirage	Where grant funding or partnership with utilities is identified, cities can implement water conservation mandates and programs and provide educational materials to support water conservation efforts.	Regional • SBCTA, CVAG, WRCOG • SoCalREN	Low	\$201 to \$999 per MTCO ₂ e ^f	Priority 1: • Draft in 2026 • Adopt in 2027

Notes:

- g. CAPCOA Handbook, 2024
- h. City of Coronado CAP, 2022
- i. Sacramento County CAP, 2024
- j. San Bernardino County Regional GHG Reduction Plan Update, 2022
- k. San Diego County CAP, 2024
- l. Derived from multiple sources

Potential Funding:

See Appendix D for a full list of acronyms and funding programs.

Accounting for Local Measures

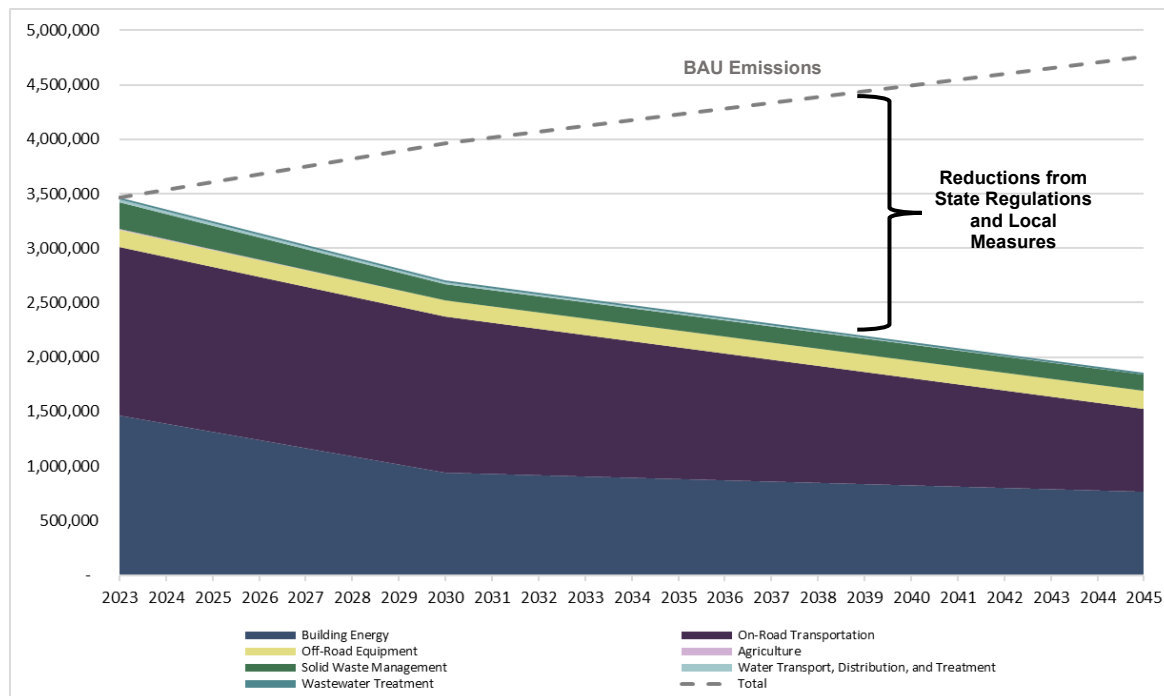
Through state regulations and locally implemented measures, GHG emissions across CVAG cities are expected to be reduced to approximately 2,548,905 MTCO₂e by 2030, and 1,475,123 MTCO₂e by 2045, as shown in **Table 3-14** and displayed graphically in **Figure 3-4** for the RIVCOM socioeconomic scenario.

The local measures included in the modeling were selected by the CVAG jurisdictions, and the local measures contributing the most to reducing emissions in 2030 include building energy (50% of total local reductions), followed by waste management (44%), on-road (4%), water (1%), and off-road and wastewater (<1%). For 2045, the sectoral contributions as a proportion of total local reductions are slightly different, with the waste sector contributing 49% of total local reductions, building energy (48%), on-road (2%), followed by water, off-road, and wastewater (<1%).

	2030	2045
Business-as-Usual Forecast	3,828,106	4,595,498
Reductions from State Measures	976,059	2,755,045
Reductions from Local Measures	303,141	365,331
Remaining Emissions After State and Local Reductions	2,548,905	1,475,123

Note: Totals may not add up due to rounding.

Figure 3-4 GHG Reductions from State and Local Measures – RIVCOM Scenario

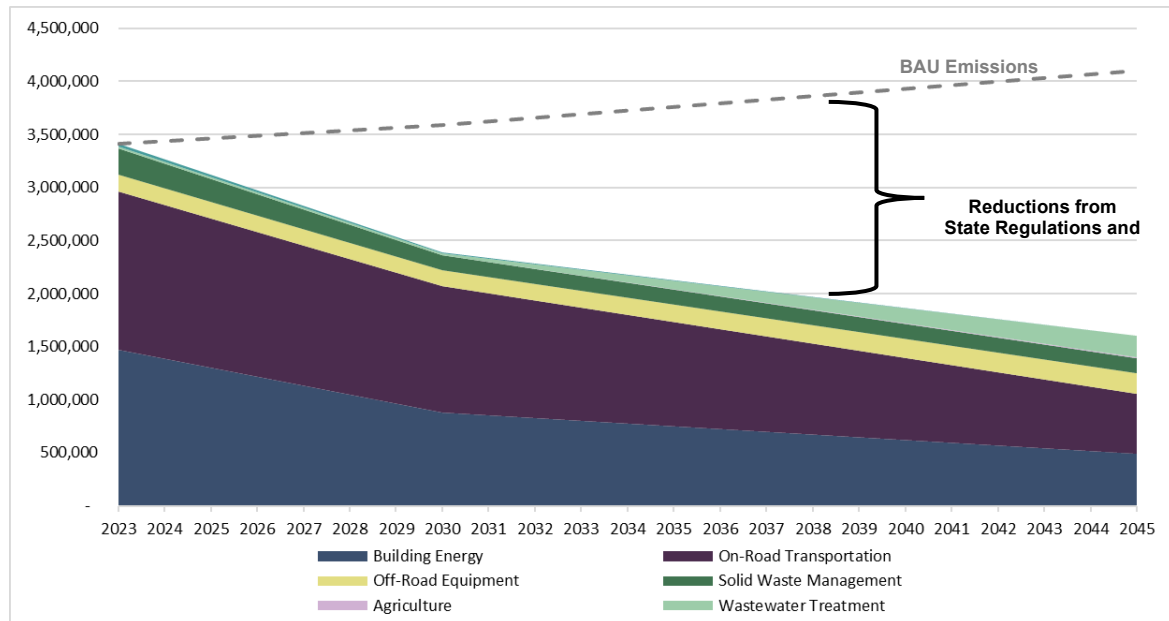


⁵⁶ The GHG reduction values are modeled using the RIVCOM socioeconomic data.

Under the DOF socioeconomic scenario, emissions across CVAG are anticipated to be reduced to approximately 2,393,201 MTCO₂e by 2030 and 1,370,580 MTCO₂e by 2045. **Table 3-15** and **Figure 3-5** displays the results for the DOF socioeconomic scenario.

Table 3-15 CVAG Cities: Remaining GHG Emissions After Accounting for State and Local Measures – DOF Scenario (MTCO₂e/yr)⁵⁷		
	2030	2045
Business-as-Usual Forecast	3,594,861	4,103,250
Reductions from State Measures	903,908	2,384,393
Reductions from Local Measures	297,752	348,278
Remaining Emissions After State and Local Reductions	2,393,201	1,370,580

Figure 3-5 GHG Reductions from State and Local Measures – DOF Scenario



Meeting GHG Reduction Targets

This section summarizes the emissions reductions estimates and GHG targets from the perspective of each of the ten CVAG cities for 2030. This is followed by an assessment of whether the jurisdictions will or will not meet the GHG targets and types of actions that could be taken to further reduce GHG emissions.

CVAG Cities Assessment for 2030

The CVAG cities selected the GHG reduction measures across each major sector to include in determining the potential GHG emissions reductions by 2030. The local measures previously described can reduce emissions to a varying degree of cost effectiveness and implementation feasibility, especially in the near term.

⁵⁷ The GHG reduction values are modeled using the DOF socioeconomic data.

In addition, the cities selected relevant GHG reductions targets for their jurisdiction (**Table 2-4** in Chapter 2). Specifically, they selected either an absolute, mass-based GHG reduction target (i.e., MTCO₂e) or a GHG reduction target based on service population (i.e., MTCO₂e as a unit of the population that resides and works in a jurisdiction). A mass-based target may be more appropriate for a jurisdiction with stable historical populations, whereas a service population metric may be more appropriate for jurisdictions that have experienced high recent growth and development.

Lastly, cities selected the socioeconomic scenario (i.e., RIVCOM or DOF), which was previously described. **Table 3-16** summarizes the jurisdictions that selected each emissions reduction measure and the 2030 aggregated GHG reduction potential under the two socioeconomic scenarios. **Table 3-17** then compares each individual city's GHG reduction target with modeled GHGs in 2030 based on the GHG reduction measures that the cities selected.

Table 3-16				
CVAG: 2030 GHG Reduction Potential by Measure				
Local Measures by Sector		Jurisdictions Implementing Measure	2030 Reduction Potential – RIVCOM (MTCO₂e/year)	2030 Reduction Potential – DOF (MTCO₂e/year)
Energy				
Energy-1	Building Electrification	Indian Wells, Indio, Palm Desert, Palm Springs	73,694	74,222
Energy-2	LED Bulbs and Fixtures	Blythe, Cathedral City, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	21,714	20,418
Energy-3	Smart Thermostat	Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	2,751	2,806
Energy-4	Appliance Electrification Upgrades	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	836	1,008
Energy-5	Solar Window Film	Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	1,510	1,394
Energy-6	Cool Roofs	Blythe, Cathedral City, Desert Hot Springs, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	157	183
Energy-7	Roofline Insulation and Attic Encapsulation	Indian Wells, Indio, Palm Springs, Rancho Mirage	1,571	1,588
Energy-8	HVAC Maintenance Program	Desert Hot Springs, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	4,797	4,951
Energy-9	Solar Installations for New Commercial and Industrial Development	Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	1,278	839
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	Desert Hot Springs, Indio, Palm Desert	4,292	4,292
Energy-11	Solar Installations for Existing Homes	Blythe, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	16,854	21,727
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	23,202	23,202
On Road Transportation				
Tier 1 Measures ^a	Land Use and Infrastructure	Blythe, Cathedral City, Coachella, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Ranch Mirage	6,902	8,221
On-Road-1	Increase Housing Density			
On-Road-2	Increase Land Use Diversity			
On-Road-3	Light-Duty EV Infrastructure			

Table 3-16
CVAG: 2030 GHG Reduction Potential by Measure

Local Measures by Sector		Jurisdictions Implementing Measure	2030 Reduction Potential – RIVCOM (MTCO ₂ e/year)	2030 Reduction Potential – DOF (MTCO ₂ e/year)
On-Road-4	Pedestrian Infrastructure Improvements			
On-Road-5	Bicycle and Micromobility Infrastructure Improvements			
On-Road-6	Transition City and Agency Fleets to ZEVs			
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	Indian Wells	518	363
On-Road-7	Increase Transit Service and Frequency			
On-Road-8	Transit Oriented Development			
On-Road-9	Transportation Demand Management			
Tier 3 Measures ^c	Pricing Tools and Incentives	Palm Springs	5,929	5,651
On-Road-10	Parking Pricing and Limited Requirements			
On-Road-11	Traffic Signal Coordination			
Off Road Transportation and Equipment				
Off Road-1	Construction Equipment Electrification	Desert Hot Springs, Indian Wells	200	270
Off Road-2	Lawn and Garden Equipment Electrification	Desert Hot Springs, Indian Wells, Palm Springs	467	373
Solid Waste				
Solid Waste-1	SB 1383 Organic Waste Recycling	Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	111,797	103,461
Solid Waste-2	Construction and Demolition Waste Diversion	Blythe, Cathedral City, Desert Hot Springs, Indio, La Quinta, Palm Desert	14,947	13,976
Solid Waste-3	Solid Waste Diversion	Blythe, Cathedral City, Desert Hot Springs, Indio, La Quinta, Palm Desert	3,210	3,002
Solid Waste-4	Food Waste Diversion	Blythe, Cathedral City, Desert Hot Springs, Indio, Palm Desert	1,740	1,619
Agriculture				
Ag-1	Urban Tree Planting	Blythe, Cathedral City, Coachella, Desert Hot Springs, Indian Wells, Indio, La Quinta, Palm Desert, Palm Springs, Rancho Mirage	40	40
Ag-2	Local Agriculture and Community Gardens	Coachella, Indio, Palm Desert	NQ	NQ
Water and Wastewater				
Wastewater-1	Equipment Upgrades	Blythe, Indian Wells, Indio	252	230
Water-1	Increase Recycled Water Use	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	35	31
Water-2	Water Conservation	Blythe, Cathedral City, Indian Wells, Indio, Palm Desert, Palm Springs, Rancho Mirage	4,448	3,886
Total Local Reductions Anticipated ^a			303,141	297,752
NOTES:				
a – Tier 1 measures were selected for all CVAG cities .				
b – Tier 2 represents additional measures selected by Indian Wells.				
c – Tier 3 represents additional measures selected by Palm Springs.				
d – Totals may not add up due to rounding.				

Table 3-17
CVAG Cities 2030 GHG Reduction Targets

Jurisdiction	Scenario	GHG Target in 2030	GHGs in 2030	Forecasted to Meet Target?
Blythe	DOF	53,413 MTCO ₂ e	47,747 MTCO ₂ e	Yes
Cathedral City	DOF	3.05 MTCO ₂ e/SP	3.04 MTCO ₂ e/SP	Yes
Coachella	RIVCOM	5.13 MTCO ₂ e/SP	2.86 MTCO ₂ e/SP	Yes
Desert Hot Springs	DOF	3.04 MTCO ₂ e/SP	2.95 MTCO ₂ e/SP	Yes
Indian Wells	DOF	9.56 MTCO ₂ e/SP	9.44 MTCO ₂ e/SP	Yes
Indio	RIVCOM	4.20 MTCO ₂ e/SP	3.28 MTCO ₂ e/SP	Yes
La Quinta	RIVCOM	359,358 MTCO ₂ e	263,965 MTCO ₂ e	Yes
Palm Desert	DOF	5.27 MTCO ₂ e/SP	5.14 MTCO ₂ e/SP	Yes
Palm Springs	RIVCOM	297,430 MTCO ₂ e	427,601 MTCO ₂ e	No
Rancho Mirage	DOF	7.19 MTCO ₂ e/SP	6.95 MTCO ₂ e/SP	Yes

Based on the selections that the CVAG cities made for emission reduction measures, GHG targets, and the socioeconomic scenario, nine of the ten cities meet their GHG target in 2030. Achieving further emission reductions could be feasible through support via additional state measures. This could include additional state incentives or regulations to expedite the reduction of GHG emissions from sectors, e.g., rebates for zero emission vehicles, higher renewables portfolio standard, etc. Likewise, cities could also pursue additional actions to reduce GHG emissions within their jurisdictional authority, such as the development of local energy efficiency standards that are more stringent than the State standard (i.e., reach code), or greater investment in transportation options, among others. In addition, cities could give additional consideration to selecting a GHG target that may be more appropriate to their unique population growth and development trajectory.

2045 Subregional Assessment

In 2045, state and local GHG emission reduction measures are projected to reduce emissions by approximately 3.1 million MTCO₂e under the RIVCOM scenario and 2.7 million MTCO₂e under the DOF scenario relative to a 2045 BAU. Despite these reductions, the CVAG subregion remains off pace to achieve its 2045 GHG reduction targets—requiring emission levels roughly 83 percent below those of 2023, equating to 603,304 MTCO₂e (RIVCOM) and 593,438 MTCO₂e (DOF) in 2045. This information is highlighted in **Table 3-18**.

Table 3-18
2045 CVAG GHG Reduction Target Analysis

	RIVCOM (MTCO ₂ e)	DOF (MTCO ₂ e)
Total Emissions (2045 BAU)	4,595,498	4,103,250
State Reductions	2,755,045	2,384,393
Local Reductions	365,331	348,278
Total Reductions	3,120,375	2,732,670
Remaining Emissions	1,475,124	1,370,580
2045 Emissions Target	603,304	593,438

Table 3-18
2045 CVAG GHG Reduction Target Analysis

	RIVCOM (MTCO_{2e})	DOF (MTCO_{2e})
Forecasted to Meet Emissions Reduction Target?	No	No
Additional Reductions Needed to Meet 2045 Target	871,891	777,141

Recognizing that existing policy interventions impacting GHG emissions may change and new policies may be introduced to accelerate GHG emissions, these estimates are a current snapshot that should be regularly updated to better assess progress to achieving the 2045 GHG target. Achieving a 2045 GHG reduction target consistent with AB 1279 will require substantial reductions from local and regional measures, with a focus building energy and transportation. Consistent with other subregions in the MSA, key strategies will include commitment to 100 percent renewable energy, building energy efficiency and electrification upgrades, transportation electrification, and reduction in VMT. Many of these strategies are discussed in CARB's 2022 Climate Change Scoping Plan Update.

In addition, regional coordination will be vital to ensure that emission reduction measures are implemented effectively across all communities in CVAG. Partnership jurisdictions in CVAG can do their part to be on track to meet the 2045 goal by continuing to coordinate with organizations such as the MPO for the region (SCAG) on transportation planning initiatives, the Inland Regional Energy Network (IREN) on building electrification and energy efficiency programs, CBOs focused on a certain community or decarbonization subject matter, and many others.

Unincorporated Riverside County Measures

This section provides a summary of the GHG emissions reductions from state reduction measures and the local GHG emission reduction strategies for Unincorporated Riverside County as state in the County of Riverside Climate Action Plan Update.⁵⁸

The first portion of this section summarizes the Unincorporated Riverside County GHG quantification analysis for the state measures in **Table 3-19**—a discussion of the measures occurred at the beginning of Chapter 2. **Table 3-19** is based on information provided in the Riverside County CAP; however, we cannot directly attribute those reduction levels to individual state measures. The state specific measures mentioned in the Riverside CAP include the Low Carbon Fuel Standard, Assembly Bill 1493 and Advanced Clean Cars, California Building Code Title 24, and Renewable Portfolio Standard. Next, is a discussion of the local measures and their quantified GHG emissions reduction projections. Last is an analysis of the Unincorporated Riverside County GHG emissions relative to GHG targets.

Table 3-19
GHG Reductions (MTCO_{2e}) from State Policies ^a

Sector	2030	2045 ^b
On-Road Transportation	1,657,567	4,695,541
Agriculture	0	0
Electricity	550,182	1,094,961
Natural Gas	24,164	52,046
Solid Waste	0	0
Water and Wastewater	34,758	71,529

⁵⁸ County of Riverside, 2019

Table 3-19
GHG Reductions (MTCO₂e) from State Policies ^a

Aviation	0	0
Off-Road Sources	0	0
Total	2,266,673	5,914,078

NOTES:

a – Corresponds to the difference in Business as Usual (BAU) and Adjusted Business As Usual (ABAU) in the County of Riverside CAP as the GHG reductions attributed to state measures

b – Interpolated based on the Riverside County CAP calculations through 2050

Local Measures

This section summarizes the local measures included in the Riverside County CAP. **Table 3-20** provides a summary of the 2030 and 2045 CO₂e reductions by measure and the summary text below provides description of each measure.

Table 3-20
GHG Reduction Measures for Unincorporated Riverside County

State Measures by Sector	2030 MTCO ₂ e Reductions	2045 MTCO ₂ e Reductions ^a
Transportation		
R2-T1: Alternative Transportation Options	161,932	317,016
R2-T2: Adopt and Implement A Bicycle Master Plan to Expand Bike Routes Around the County	2,234	4,373
R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses	182,846	357,961
R2-T4: Electrify the Fleet	274,370	537,139
Energy		
R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector	- ¹	-
R2-EE2: Increase community Participation in Existing Energy Efficiency Programs	16,845	25,280
R2-EE3: Home Energy Evaluations	- ¹	-
R2-EE4: Residential Home Energy Renovations	11,749	17,631
R2-EE5: Exceed Energy Efficiency in New Residential Units	39,408	248,826
R2-EE6: Energy Efficiency Training, Education, and Recognition in Commercial Sector	- ¹	-
R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs	31,878	58,767
R2-EE8: Non-Residential Building Energy Audits	- ¹	-
R2-EE9: Non-Residential Building Retrofits	173,554	319,949
R2-EE10: Energy Efficiency Enhancement of Existing and New Infrastructure	- ¹	-
R2-EE11: Exceed Energy Efficiency in New Commercial Units	33,418	443,475
Clean Energy		
R2-CE1: Clean Energy	34,204	34,204
R2-CE2: Community Choice Aggregation Program Reductions (If Implemented)	609,022	609,022
Advanced Measures		
R2-L1: Tree Planting for Shading and Energy Saving	13	20
R2-L2: Light-Reflecting Surfaces for Energy Saving	1,845	2,932
Water Efficiency		
R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7	5,666	9,002
R2-W2: Exceed Water Efficiency Standards	116	184
Solid Waste		
R2-S1: Reduce Waste to Landfills	88,362	140,397
Total Reductions	1,667,460	3,126,177
Key 1 Indicates Supportive Measures. No GHG reductions were calculated.		
NOTES:		
a – Interpolated based on the Riverside County CAP calculations through 2050.		

Local Measures- Transportation***R2-T1: Alternative Transportation Options***

Alternative transportation includes taking transit and non-motorized transportation options, among them walking and bicycling, and variants such as small-wheeled transport such as skates, skateboards, push scooters and hand carts, and wheelchair travel. These modes provide both recreation and transportation, and can reduce VMT by removing automobiles from the road. This is an enhancement of Measures R2-T2, R2-T3, R2-T6, R2-T9, and R3-T1 proposed in the 2015 CAP. Potential actions for this measure include:

- Work with SCAG and the community to remove barriers to alternative transportation.
- Create a “bike to work day” or “car-free zone day” and other County sponsored events to promote
- bicycling and other non-motorized transportation.
- Create additional active transportation routes from transit centers to surrounding residential areas.
- Implement reduced parking requirement in areas served by transit.

R2-T2: Adopt and Implement A Bicycle Master Plan to Expand Bike Routes Around the County

Bicycle-friendly roads are crucial to promoting bicycle use as a transportation method. People tend to bicycle if routes are available to separate them from motor vehicles and bicyclists’ safety can be ensured. Currently, Riverside County has not adopted a bicycle master plan. Thus, adopting and implementing a bicycle master plan and constructing more bicycle routes would encourage more bicycle rides and would help to reduce VMT. This is a new measure for the County’s consideration. Potential action for this measure includes:

- Adopt and implement a bicycle master plan.
- Expand bicycle routes and prioritize funding for Class I bicycle lanes to improve bike transit.

R2-T3: Ride-Sharing and Bike-to-Work Programs within Businesses

Approximately 81 percent of people living in unincorporated area of Riverside County drive alone to work every day.⁵⁹ A higher ride-sharing rate or bike-to-work rate would mean fewer VMT and GHG emissions, so encouraging carpooling and bicycling by providing incentive programs and necessary facilities can reduce GHG emissions. This is an enhancement of Measures R2-T1, R2-T4, and R2-T6 proposed in the 2015 CAP. Potential actions for this measure include:

- Promote ride-sharing and facilitate air district incentives for ride-sharing.
- Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low- or zero-emission vehicles.

⁵⁹ SCAG, 2017

- Zoning code update that requires businesses of a certain size to provide facilities such as bicycle racks.

R2-T4: Electrify the Fleet

Hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric vehicles (EVs) produce lower emissions than conventional vehicles. Any type of electrified vehicle emits less GHG than conventional vehicles by at least 40 percent. 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 highly needed. With the Statewide EV ownership goal and the implementation of this measure, EV ownership in Riverside County could reach 13 percent by 2030. Per the Settlement Agreement, for all new residential development, the County requires installation of EV charging stations in the garages of the residential units.⁶⁰ The Settlement Agreement further states that the capacity and circuits for installation of EV charging stations to be provided in the garages of residential units and all new large-scale commercial buildings that are over 162,000 square feet. This is an enhancement of Measures R2-T7 and R3-T2 proposed in the 2015 CAP. Potential actions for this measure include:

- Require all new residential development to include EV chargers in the garages of residential units.
- Promote EV incentive programs at outreach meetings.
- Promote Neighborhood Electric Vehicle (NEV).
- Support application for grants to install e-chargers at public facilities.
- Work with community groups and businesses to install e-chargers.
- Comply with State Title 24 energy efficiency requirements for new commercial development to install e-chargers starting in 2020.

Local Measures- Energy

R2-EE1: Energy Efficiency Training, Education, and Recognition in the Residential Sector

Opportunities for residents to improve energy efficiency in their homes include changes to their behaviors and physical modifications or improvements to their homes. Education of the public is at the core of attaining energy efficiency goals. While most of the measures include an outreach component, creating a specific education measure would emphasize the critical role of education in achieving energy efficiency. An education measure would also provide County staff with a framework to educate community members about behavioral and technological changes that can increase energy efficiency. This is an enhancement of Measure R3-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Post energy efficiency information or links on websites and/or social media and provide materials at public events.
- Set up an email list for blasts of new information or training sessions.

⁶⁰ Center for Climate Integrity, 2018

- Encourage homeowners to use the SCE Energy Education Centers for energy-efficiency resources.
- Promote and manage energy-efficiency programs which are not already in the purview of Energy Service Providers.
- Require building inspectors to hold trainings semi-annually on energy efficiency and Title 24 requirements.

R2-EE2: Increase community Participation in Existing Energy Efficiency Programs

There are many energy efficiency opportunities that are low-cost for residents to initiate and would result in cost savings over time. These opportunities are generally from existing programs, such as SCE and SoCalGas, which offer rebates and incentives to purchase energy-efficient appliances and lights. Through this measure, the County would work to increase residents' participation in existing energy efficiency programs that are low-cost and would provide a financial benefit to the residents. As programs change over time, continued and up-to-date outreach would be necessary. This is an enhancement of Measure R3-E4 proposed in the 2015 CAP. Potential action for this measure includes:

- Partner with the Southern California Association of Governments (SCAG), Western Riverside Council of Governments (WRCOG), SCE, and SoCalGas for outreach events, such as annual energy-efficiency fair.

R2-EE3: Home Energy Evaluations

Home energy evaluations are necessary to identify cost-effective opportunities for energy savings and for residents to take practical actions to achieve energy efficiency. Home energy evaluations can be established or promoted by a variety of existing programs. This is a new measure for the County's consideration. Potential action for this measure includes:

- Promote SCE energy audits program for residents within the SCE service area and the Home Energy Saver Do It Yourself online energy audits for the IID service area.

R2-EE4: Residential Home Energy Renovations

Approximately 31 percent of the residential buildings in the unincorporated area of Riverside County were constructed before the adoption of Title 24 (SCAG 2017). Renovations to buildings constructed before the adoption of Title 24 would evidently improve energy efficiency. Many federal and State programs and incentives support home energy renovations, including County-supervised funding, permit process improvements, and County ordinances. This is an enhancement of Measures R1-E4, R1-E5, R2-E3, and R2-E4 proposed in the 2015 CAP. Potential actions for this measure include:

- Review Title 24 code compliance for existing residential buildings during code enforcement inspections of residential properties.
- Promote existing home energy-renovation programs.
- Promote participation in green building programs, such as Leadership in Energy and Environmental Design (LEED) and Energy Upgrade California.
- Promote financing programs for home upgrades.
- Establish online permitting to facilitate upgrades.

R2-EE5: Exceed Energy Efficiency in New Residential Units

County planners have a unique opportunity to encourage or inform developers of new energy efficiency opportunities for new development. This measure would educate County staff to encourage and implement energy efficiency measures beyond those required in current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, County staff are well informed and can implement updates quickly and effectively. This is an enhancement of Measures R2-E1 and R2-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Educate County staff and developers on future Title 24 updates and new energy efficiency opportunities for new residential development.
- Promote Tier 1 and Tier 2 green building ratings such as LEED, Build It Green, or Energy Star®-certified buildings.
- Establish online permitting to facilitate new residential building energy-efficiency programs.
- Comply with State Title 24 energy efficiency requirements on new residential buildings, such as zero net energy homes that require all new residential construction projects to achieve zero net-energy use by 2020.

R2-EE6: Energy Efficiency Training, Education, and Recognition in Commercial Sector

Education is at the core of attaining energy efficiency goals. A specific education measure would emphasize the critical role of education in achieving energy efficiency. This measure would provide County staff with a framework to interact with and educate the community about behavioral and technological changes that can County of Riverside Climate Action Plan Update November 2019 4-9 increase energy efficiency in commercial buildings. This is an enhancement of Measure R3-E2 proposed in the 2015 CAP. Potential actions for this measure include:

- Post energy-efficiency information or links on websites and/or social media and provide materials at public events
- Set up an email list for blasts of new information or training sessions.
- Encourage business owners to visit SCE Energy Education Centers for energy efficiency resources.
- Promote and manage energy efficiency programs which are not already in the purview of Energy Service Providers.
- Invite building inspectors to hold trainings semi-annually on energy efficiency and Title 24.

R2-EE7: Increase Business Participation in Existing Energy Efficiency Programs

There are many energy efficiency opportunities that are low-cost for businesses to initiate that would result in cost-savings over time. SCE and SoCalGas offer many rebates and incentives to purchasing energy-efficient appliances and lights. As many business owners may be unaware that the opportunities exist, this measure would allow for the County to increase the participation of businesses in existing energy-efficiency programs that are low-cost and would provide financial

benefits. This is an enhancement of Measure R3-E4 proposed in the 2015 CAP. Potential action for this measure includes:

- Partner with SCAG, WRCOG, SCE, and SoCalGas for outreach events.

R2-EE8: Non-Residential Building Energy Audits

Commercial energy audits are necessary to identify cost-effective opportunities for energy savings and for business owners to take practical actions to increase energy efficiency. The audits can be established or promoted by various existing programs. This is a new measure for the County's consideration. The potential action for this measure is:

- Promote the SCE energy audit program for residents within the SCE service area and the Home Energy Saver Do It Yourself online energy audits for the IID service area.

R2-EE9: Non-Residential Building Retrofits

As many of commercial buildings in unincorporated area of Riverside County were constructed before the adoption of Title 24, their facilities and equipment are not considered energy efficient. Therefore, retrofits are necessary to achieve higher energy efficiency. Many federal and State programs and incentives support nonresidential building energy retrofits, including County-supervised funding, permit process improvements, and County ordinances. This is an enhancement of Measures R1-E4, R1-E5, and R2-E7 proposed in the 2015 CAP. Potential actions for this measure include:

- Review Title 24 code compliance for existing non-residential buildings during code enforcement inspections.
- Promote existing non-residential building retrofits programs.
- Promote participation in green building programs, such as California Solar Initiative.
- Promote energy efficiency retrofit financing programs for non-residential buildings such as Property Assessed Clean Energy (PACE).
- Establish online permitting to facilitate retrofits.

R2-EE10: Energy Efficiency Enhancement of Existing and New Infrastructure

Enhancing energy efficiency of existing and new infrastructure presents an opportunity for energy and cost savings for the County. The County could achieve energy savings by deploying high-efficiency lighting in new traffic signals and retrofitting existing traffic signals with energy-efficient lighting. Conventional traffic signals employ incandescent lamps. They are not energy-efficient and the on-going energy charge contributes a high proportion of the recurrent cost. Comparing with the conventional traffic signals, high-efficiency traffic signals consume much less electricity (about one-third or less) and have longer design life (over 10 years). The Settlement Agreement calls for consideration of a policy to require the use of high-efficiency bulbs at all new traffic signal lights and converting 100 percent existing traffic signal lights to high-efficiency bulbs by 2020.⁶¹ Per the Settlement Agreement, caution should be exercised while retrofitting the signals in the Mt. Palomar area to ensure the high efficiency bulbs do not

⁶¹ Center for Climate Integrity, 2018

cause any interference with the night sky viewing at Palomar Observatory. The potential actions for this measure include:

- Retrofit existing traffic signals with high-efficiency Light Emitting diodes (LEDs).
- Use high-efficiency LEDs for all new traffic signals.

R2-EE11: Exceed Energy Efficiency in New Commercial Units

County planners have a unique opportunity to inform and encourage developers to apply new energy efficiency opportunities in new development. This measure would educate County staff to encourage and implement energy efficiency beyond that required by current Title 24 standards. This measure would also ensure that as Title 24 standards are updated, County staff would be well informed and could implement updates quickly and effectively. This is an enhancement of Measures R2-E5 and R2-E6 proposed in the 2015 CAP. Potential actions for this measure include:

- Educate County staff and developers on future Title 24 updates and additional energy efficiency opportunities for new non-residential development.
- Promote Tier 1 and Tier 2 Green Building Ratings such as LEED, Build It Green, or Energy Star®-certified buildings.
- Establish online permitting to facilitate new non-residential building energy efficiency programs.
- Comply with State requirements on new non-residential buildings, such as Net-Zero Energy Buildings for all new non-residential development meeting zero net-energy use by 2030.

Local Measures- Clean Energy

R2-CE1: Clean Energy

Clean energy includes energy efficiency and clean energy supply options such as highly efficient combined heat and power as well as renewable energy sources. Installing solar photovoltaics panels on residential and commercial building rooftops is an effective way to produce renewable energy on-site. Moreover, when combined with energy storage systems, solar panels could continuously meet residential and commercial energy demand. The Riverside County Settlement Agreement requires that on-site renewable energy production (including but not limited to solar) shall apply to any tentative tract map, plot plan, or conditional use permit that proposes to add more than 75 new dwelling units of residential development or one or more new buildings totaling more than 100,000 gross square feet of commercial, office, industrial, or manufacturing development.⁶² Renewable energy production shall be onsite generation of at least 20 percent of energy demand for commercial, office, industrial or manufacturing development, meet or exceed 20 percent of energy demand for multi-family residential development, and meet or exceed 30 percent of energy demand for single-family residential development. These renewable energy requirements should be updated with every CAP Update by the County based on most recent technology advancements. By identifying, designing, and implementing the clean energy measures and technology solutions, Riverside County would receive environmental and economic

⁶² Center for Climate Integrity, 2018

benefits, including reductions in GHG emissions. This is an enhancement of Measures R1-E6 and R3-E3 proposed in the 2015 CAP. Potential action for this measure includes:

- Outreach to the community to promote clean energy incentives.
- Require solar panel installation on new residential buildings (per conditions of the Settlement agreement described above).
- Require solar panel installation on new commercial buildings and commercial parking lots (per conditions of the Settlement Agreement described above).
- Encourage energy storage system installation with solar panels.

R2-CE2: Community Choice Aggregation Program Reductions (If Implemented)

Assembly Bill 117, which was signed into law in 2002, allows California cities and counties to either individually or collectively supply electricity to customers within their borders through the establishment of a Community Choice Aggregation (CCA) program. The County could assess the feasibility of initiating a CCA program. CCA programs that are currently operating have renewable energy percentages between 33 and 100, and the national opt-out rates for these programs range from 3 to 8 percent with most programs at or below 5 percent.⁶³ Participation in a CCA program could provide a significant source of future emission reductions to the County. The first step is to conduct a feasibility analysis to assess the benefits, costs, risks, and obstacles of a CCA program. Then the County could make a decision to whether or not implement a local CCA program or opt for a regional CCA. The advantages of regional CCAs that include participation from multiple local jurisdictions would be the creation of efficiencies. The County could seek opportunities for collaboration with other local jurisdictions to develop and implement a CCA that would produce mutually beneficial results. Developing a CCA would require a detailed analysis of energy demand, efficiency opportunities, and available clean electricity sources for purchase. Per the Settlement Agreement, the County must update the CAP every four years.⁶⁴ This allows enough time to conduct a feasibility analysis on initiating a CCA program and provide details on the reduction potential based upon the decisions of the County.

Potential action for this measure includes:

- Evaluate the potential for implementing a CCA program to meet GHG reduction targets
- Conduct feasibility analysis to initiate a CCA program at the County level or in cooperation with other jurisdictions.

Local Measures- Advanced Measures

R2-L1: Tree Planting for Shading and Energy Saving

Trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration, making vegetation a simple and effective way to reduce urban heat islands. Shaded surfaces may be 20 to 45 degrees Fahrenheit ([°F], equal to 11 to 25 degrees Celsius [°C]) cooler than the peak temperatures of unshaded materials. In addition, evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2 to 9 °F (or 1 to 5 °C). Trees and vegetation that directly shade buildings can reduce energy use by decreasing

⁶³ Local Energy Aggregation Network, 2018

⁶⁴ Center for Climate Integrity, 2018

demand for air conditioning. This is an enhancement of Measure R3-L1 proposed in the 2015 CAP. Potential actions for this measure include:

- Work with the community to support nonprofit tree-planting groups within the County consisting of volunteers to plant and care for trees correctly and safely.
- Develop and promote a County tree-planting program for new development at plan check.

R2-L2: Light-Reflecting Surfaces for Energy Saving

Replacing surface areas with light-reflecting materials can decrease heat absorption and lower outside air temperature. Both roofs and pavements are ideal surfaces for taking advantage of this advanced technology.

A cool roof is built from materials with high thermal emittance and high solar reflectance, or albedo, to help reflect sunlight and the associated energy away from a building. These properties help roofs absorb less heat and stay up to 50 to 60 °F (or 28 to 33 °C) cooler than conventional materials during peak summer weather. Cool roofs may be installed on low-slope roofs (such as the flat or gently sloping roofs typically found on commercial, industrial, and office buildings) or the steep-sloped roofs used in many residences and retail buildings.

Cool pavement is built from materials that reflect more solar energy, enhance water evaporation, or have been otherwise modified to remain cooler than conventional pavements. Cool pavement can be created with existing paving technologies as well as newer approaches such as the use of coatings, permeable paving, or grass paving. Cool pavements save energy by lowering the outside air temperature, allowing air conditioners to cool buildings with less energy, and reducing the need for electric street lighting at night.

This is an enhancement of Measure R3-L2 proposed in the 2015 CAP. Potential actions for this measure include:

- Comply with Title 24 requirements on installing enhanced cool roofs.
- Comply with Title 24 requirements on installing cool pavements.

Local Measures- Water Efficiency

R2-W1: Water Efficiency through Enhanced Implementation of Senate Bill X7-7

SB X7-7, or The Water Conservation Act of 2009, requires all water suppliers to increase water use efficiency. The legislation set an overall goal of reducing per capita urban water consumption by 20 percent from a baseline level by 2020. While water districts are responsible for implementation of SB X7-7, the County can provide a meaningful supporting role in the implementation of water conservation. This goal can be met by taking a variety of actions, including supporting targeted public outreach by water districts and promoting water efficiency measures such as low-irrigation landscaping. This is an enhancement of Measure R2-W1 proposed in the 2015 CAP. Potential actions for this measure include:

- Provide general water efficiency information and links to water district conservation webpages on the County's website.
- Implement the low-irrigation landscaping requirements.

R2-W2: Exceed Water Efficiency Standards

In addition to SB X7-7, more actions are being studied or have been taken to exceed water efficiency standards. These efforts include education and outreach practices that could be combined with residential and commercial actions that promote reuse or recycled water, use of grey water, and the collection and use of harvested rainwater. This is an enhancement of Measures R2-W1 and R2-W2 proposed in the 2015 CAP. Potential actions for this measure include:

- Support water districts in direct outreach to homeowner associations, businesses, and other community groups to inform them on water efficiency standards
- Promote recycled or grey water for community uses such as residential landscaping.
- Promote rainwater harvesting rebates and demonstrations.

Local Measures- Solid Waste***R2-S1: Reduce Waste to Landfills***

According to 2014 Statewide Waste Characterization data, much of the waste disposed in landfills is readily recyclable.⁶⁵ Increasing the recovery of recyclable materials will directly reduce GHG emissions. In particular, recycled materials can reduce the GHG emissions from multiple phases of product production, including extraction of raw materials, preprocessing, and manufacturing. This is an enhancement of Measures R1-S1, R2-S1, R3-S2, and R3-S3 proposed in the 2015 CAP. Potential actions for this measure include:

- Outreach to the community to promote waste recycling and diversion.
- Add additional recycling containers in public places.
- Comply with Statewide waste reduction, recycling, and composting requirements.
- Promote community clean-up days by providing commercial containers for trash and recycling.

Meeting GHG Reduction Targets***2030 and 2045 Subregional Assessment***

By 2030, the State-wide and local measures together would reduce the Riverside County's community GHG emissions from the 2030 BAU level to 2,434,649 MTCO₂e, which exceeds the 49 percent below 2008 levels reduction target of 3,576,598 MTCO₂e for 2030. In 2045, implementation of State-wide and local measures together would reduce emissions from the 2045 BAU level to 1,030,710 MTCO₂e, which does not exceed the 86 percent below 2008 levels reduction target of 981,811 MTCO₂e for 2045. **Table 3-21** summarizes the baseline 2008 GHG emissions, the projected 2030 and 2045 emission inventories, as well as the reduced 2030 and 2045 inventories after implementation of the GHG reduction measures.

Table 3-21			
GHG Emissions and GHG Targets Comparison for Unincorporated Riverside County			
Emissions, Goals, and Targets	2008	2030	2045 ^a
BAU Emissions (MTCO ₂ e)	7,012,938	6,368,781	10,070,965

⁶⁵ CalRecycle, 2015

Table 3-21 GHG Emissions and GHG Targets Comparison for Unincorporated Riverside County			
Emissions, Goals, and Targets	2008	2030	2045 ^a
State-Aligned Target (MTCO ₂ e)	—	3,576,598	981,811
State and Federal Reductions	—	2,266,672	5,914,078
Local Measure Reductions	—	1,667,460	3,126,177
Total Adjusted Emissions	—	2,434,649	1,030,710
Additional Reductions Needs	—	Target Met	Target Not Met
NOTES:			
a – Interpolated based on the Riverside County CAP calculations through 2050			
b – Calculated based on State GHG inventory data for 2008 and AB 1279 GHG target for 2045. Specifically, California GHG inventory for 1990 is 431 MMTCO ₂ e and 478.8 MMTCO ₂ e for 2008. The 2008 GHG emissions would need to be reduced by 86 percent to achieve the AB 1279 GHG target of 64.65 MMTCO ₂ e.			

SBCOG Measures

The GHG reduction measures for the SBCOG subregion are 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 1, 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 3-22** are described in Appendix B of the San Bernardino Regional GHG Reduction Plan.

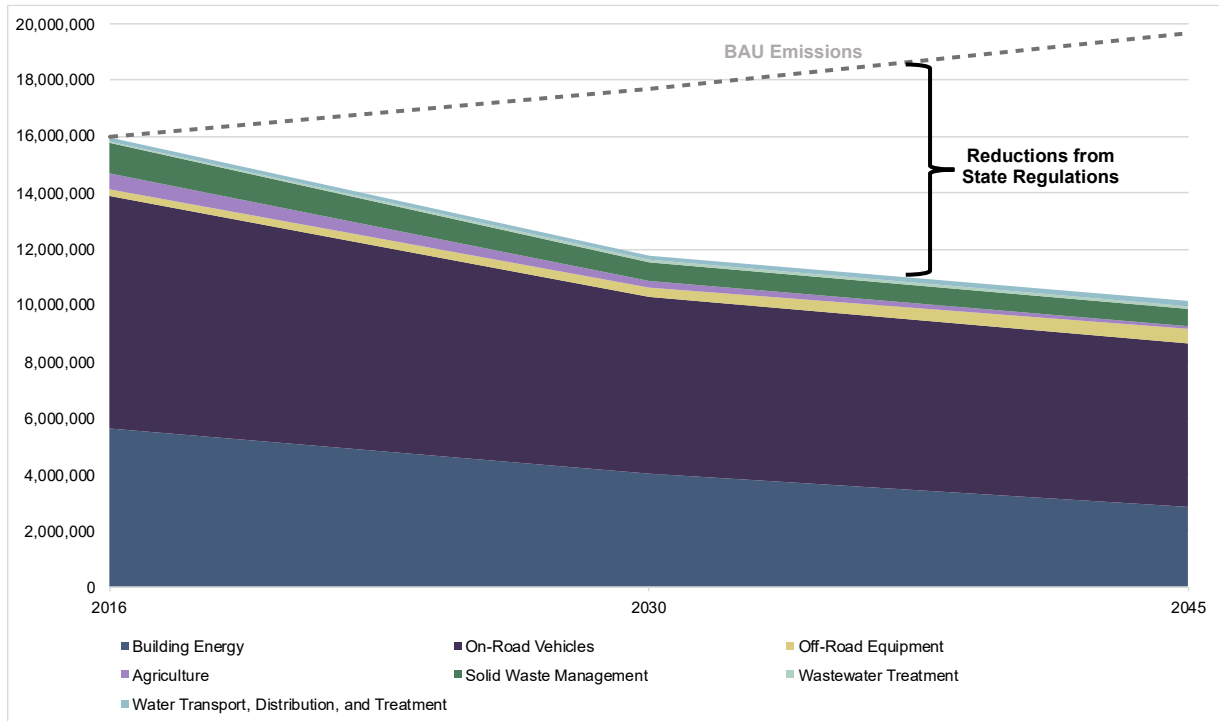
GHG Reduction for State Measures

Table 3-22 summarizes the impact of statewide standards and regulations on SBCOG’s emissions forecasts for 2030 and 2045. **Figure 3-6** illustrates the combined effect of these forecasts for the subregion. By 2030, statewide standards and regulations are expected to reduce community emissions by approximately 5,893,212 MTCO₂e, or an estimated 33 percent from the BAU forecast. By 2045, statewide measures are expected to reduce community emissions by approximately 9,478,645 MTCO₂e per year, or an estimated 48 percent from the BAU forecast. With state-imposed regulations, emissions are expected to decrease through the year 2045, compared to the BAU forecast that shows an increase over the same period. Methods used to quantify reductions are included in Appendix B of the San Bernardino Regional GHG Reduction Plan.

Table 3-22 SBCOG GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
State-1: SB100 (2018) Renewables Portfolio Standard (RPS)	1,678,198	4,431,844
State-2: Title 24 Building Energy Efficiency Standards	786,627	200,733
State-3: SB 350 Clean Energy and Pollution Reduction Act	142,227	187,712
State-4: AB 1470 (Huffman) Solar Water Heaters	1,373	1,117
State-5: Co-Generation Facilities	9,731	-
Transportation		
State-6: AB 1493 (Pavley I and II) Greenhouse Reductions from New Passenger Vehicles	2,690,435	3,868,705
Waste		
State-7: SB1383 Methane Capture	584,621	788,534
Total Reduction from State Measures	5,893,212	9,478,645

Note: Totals may not add up due to rounding.

Figure 3-6 SBCOG Subregion: Community GHG Emissions After Accounting for State Measures, by Sector (MTCO₂e/year) – All Cities Combined



Local Measures

This section describes the local measures available to SBCOG cities for reducing measures across the sectors of Energy, Transportation, Solid Waste, Water, and Agriculture, followed by estimates of reductions that can feasibly be achieved by these measures by the year 2030 and 2045.

Table 3-23 lists these local measures and identifies where they can be found in the existing CAPs in the SBCOG subregion, including SBCOG's GHG Reduction Plan (2021).

ID	CCAP Measure	Sources (see key below)	Subregional GHG Reduction Potential by 2030 (MTCO ₂ e)	Subregional GHG Reduction Potential by 2045 (MTCO ₂ e)
Building Energy				
Energy-1	Energy Efficiency for Existing Buildings	1,2,3,4,5,7,8,9	80,484	0
Energy-2	Outdoor Lighting	1,3,7,8,9	13,899	47,961
Energy-3	Building Electrification	1,2,7	195,556	0
Energy-4	Solar Installations for New Commercial/Industrial Development	1,2,4,7	0	285,294
Energy-5	On-site Solar Energy for New and Existing Warehouse Space	1,4,7	16,376	0
Energy-6	Solar Installations for Existing Housing	1,2,3,4,5,6,7,9	171,072	0
Energy-7	Solar Installations for Existing Commercial Buildings	1,2,3,4,6,7,8,9	145,397	0

Table 3-23
Local GHG Reduction Measures - SBCOG Subregion

ID	CCAP Measure	Sources (see key below)	Subregional GHG Reduction Potential by 2030 (MTCO ₂ e)	Subregional GHG Reduction Potential by 2045 (MTCO ₂ e)
On Road Transportation				
On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric	1,2	4,697	5,027
Transportation-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting	1,2,3,4,7	82,785	75,998
Transportation-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization	1,3,4,7	48,580	45,829
Transportation-4	Expand Bike Routes	1,2,3,4,7	59,201	183,152
Transportation-5	Community Fleet Electrification	1,4,5,7	50,810	315,870
Off Road Transportation and Equipment				
Off Road-1	Electric-Powered Construction Equipment	1,4,7,8	7,628	9,181
Off Road-2	Idling Ordinance	1,4,8,9	2,719	3,329
Off Road-3	Electric Landscaping Equipment	1,8	3,179	4,278
Solid Waste Management				
Waste-1	Waste Diversion	1,3,4,7,8,9	379,076	356,035
Water Conveyance				
Water-1	Require Adoption of the Voluntary CALGREEN water efficiency measures for New Construction	1,4,8	16,447	26,857
Water-2	Require Adoption of the Voluntary CALGREEN water efficiency measures for Existing Buildings	1,4,8	73,578	78,917
Water-3	Encourage Water-Efficient Landscaping Practices	1,3,4,6,7,8,9	15,551	0
Wastewater Treatment and Discharge				
Wastewater-1	Methane Recovery	1,8	1,006	1,112
Wastewater-2	Equipment Upgrades	1,4	2,748	0
Agriculture				
Agriculture-1	Methane Capture at Large Dairies	1,4	32,647	12,044
Land Use and Urban Design				
Land Use-1	Promote Rooftop Gardens	1,4	4	0
Land Use-2	Urban Tree Planting	1,2,4,7,8	323	0
GHG Performance Standard for New Development				
PS-1	GHG Performance Standard for New Development	1,3,6,7,8,9	230,315	21,780
Total Reduction From Local Measures			7,812,982	6,797,564
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)				

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 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 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.

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.

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.

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.

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.

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.

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.

Table 3-24
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-1	Energy Efficiency	Individual jurisdiction governments	Authority to implement energy efficiency measures and upgrades rests with local planning or building departments, sustainability offices, and utility programs. Planning and building departments issue permits and ensures code compliance for appliance replacements and installations, local governments may also offer incentives or bulk purchasing program, and utilities could provide rebates and technical support for electrification upgrades.	Federal: • DOE • HHS • HUD • IRS State: • CEC • CPUC • HCD Regional: • SCE • SoCalGas • SoCalRen	Medium	Net Benefit ^d	Priority 2: • Draft in 2028 • Adopt in 2029
Energy-2	Lighting Efficiency	Individual jurisdiction governments	Local governments have the primary implementation authority in LED lighting upgrades. Building departments may establish or enforce lighting standards in new construction and major renovations; sustainability offices may run rebate or direct-install programs; and utilities can provide incentives for LED upgrades under energy efficiency programs regulated by the CPUC.	Regional: • SCE • SoCalRen	Low	Net Benefit ^d	Priority 1: • Draft in 2026 • Adopt in 2027

Table 3-24
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-3	Building Electrification	Individual jurisdiction governments	The authority to implement this measure rests with local planning and building departments, state energy agencies, and utility programs. - Planning departments can adopt ordinances requiring building electrification of new developments - State agencies like the California Energy Commission set building energy standards under Title 24 - Utilities may offer incentives for residential and commercial upgrades under energy efficiency programs regulated by the California Public Utilities Committee.	Federal: - DOE - HHS - HUD - IRS State: - CEC - CPUC - HCD Regional: - SCE - SoCalRen	High	> \$1,000 per MTCO ₂ e ^d	Priority 3: - Draft in 2028 - Adopt in 2029
Energy-4	Solar Installation for New Housing Developments	Individual jurisdiction governments in coordination with various private companies	The CEC enforces solar mandates under Title 24 for new housing developments. Local building departments have the authority to implement T24 standards, to issue permits, and inspect installations.	Federal: - DOE - IRS State: - CSD - CPUC Regional: - CPA - SCE	Low	Net Benefit ^d	Priority 1: - Draft in 2026 - Adopt in 2027

Table 3-24
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-5	Renewable Energy – New Commercial/Industrial	Individual jurisdiction governments in coordination with various private companies	The authority to implement and expand solar installations in existing commercial and industrial buildings rests with building departments to issue permits and inspect installations. and state energy agencies. Planning departments can adopt ordinances requiring solar readiness or installations in new developments; building departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE State: • CPUC Regional: SCE	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028
Energy-6	Solar Energy for Warehouse Space	Individual jurisdiction governments in coordination with various private companies	Implementation authority includes Planning Departments, Building Departments, and local sustainability offices. Planning Departments may designate zoning or incentives for solar installations on warehouse rooftops; Building Departments oversee permitting and code compliance; and local governments may promote adoption through outreach or green building programs.	• DOE State: • CPUC Regional: SCE	Medium	Net Benefit ^d	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-24
CVAG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Energy-7	Solar Installation for Existing Housing	Individual jurisdiction governments in coordination with various private companies	The authority to implement and expand solar installations in existing homes rests with building departments to issue permits and inspect installations, and state energy agencies. Planning Departments can adopt ordinances requiring solar readiness or installations in new developments; Building Departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE • IRS State: • CSD • CPUC Regional: • CPA • SCE	Low	Net Benefit ^d	Priority 1: • Draft in 2026 • Adopt in 2027
Energy-8	Solar Installation for Existing Commercial/Industrial	Individual jurisdiction governments in coordination with various private companies	Authority to implement solar installations in existing commercial and industrial projects rests with Planning Departments, Building Departments, and state energy agencies. Planning Departments can adopt ordinances requiring solar readiness or installations in new developments; Building Departments issue permits and inspect installations; and the CEC enforces solar mandates under Title 24 for certain building types.	Federal: • DOE State: • CPUC Regional: SCE	Low	Net Benefit ^d	Priority 1: • Draft in 2026 • Adopt in 2027
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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.

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 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.⁶⁶ 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.

⁶⁶ Gallup, 2020

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 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.

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.

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.⁶⁷ 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.

⁶⁷ CSE, 2019

Table 3-25
SBCOG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric	Transit authorities serving the County are primarily responsible for this measure, including OmniTrans, Victor Valley Transit Authority, Morongo Basin Transit Authority, Mountain Transit, and Needles Area Transit. The jurisdiction governments would coordinate with transit authorities as appropriate.	The authority to transition city owned and managed fleets rests within the local government itself.	Federal - NEVI program State: - SCE - CARB - CEC's Clean Transportation Program - CEC's CALeVIP Regional: - IREN/Clean Cities	High	> \$1,000 per MTCO ₂ e ^d	Priority 3: - Draft in 2028 - Adopt in 2029
On-Road-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting	Individual jurisdiction governments	The authority to encourage the use of mass transit, carpooling, ride sharing, and telecommuting is shared among local city departments, local and regional transit services, regional transportation authorities, and state-level agencies. SBCTA develops short and long range transportation plans that can encourage the shift to non-single occupancy vehicles.	Federal: - US DOT - IIJA State: - CARB - CalTrans - CalSTA Regional: - CVAG	Low	Ranges from net benefit to > \$1,000 per MTCO ₂ e ^f	Priority 1: - Draft in 2026 - Adopt in 2027

Table 3-25
SBCOG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
On-Road-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization	Individual jurisdiction governments and SBCTA	City Public Works or Transportation Departments typically lead TDM efforts, which include carpool and car share programs. Responsibilities can range from managing parking supply and prioritizing carpool and clean vehicle spaces, implementing ordinances that incentivize developers to include car share vehicles and memberships in new developments, and supporting pilot programs for carsharing in multifamily housing. For traffic signal coordination, implementation is shared among local city departments, SBCTA, and Caltrans depending on jurisdiction and roadway ownership.	Federal: • US DOT State: • CalTrans	Medium	>\$1000 per MTCO ₂ e ^d	Priority 2: • Draft in 2027 • Adopt in 2028
On-Road-4	Expand Bike Routes	Individual jurisdiction governments	Authority over the implementation of the plans and codes adopted.	Federal: • US DOT State: • Caltrans • CalSTA Regional: • SBCOG	Medium	Net Benefit ^b	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-25
SBCOG On-Road Transportation Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e) ^d	Implementation Milestones
On-Road-5	Community Fleet Electrification	Individual jurisdiction governments and SBCTA	The authority to electrify the community fleet through expanding publicly accessible EV charging infrastructure rests with a combination of local departments, state agencies, and utility partnerships. Within local governments, Planning Departments can adopt ordinances requiring EV infrastructure in new developments and designate zoning for EV-friendly uses; Building and Safety Departments are typically responsible for issuing permits and conducting inspections for EV charging installations; and Public Works or Transportation Departments may manage public right-of-way installations, parking designations, and fleet electrification. AB 1236 (2015) and AB 970 (2021) require all California cities and counties to adopt streamlined permitting ordinances for EV charging stations.	Federal • NEVI program State: • SCE • CARB • CEC's Clean Transportation Program • CEC's CALeVIP Regional: • IREN/Clean Cities	High	>\$1000 per MTCO ₂ e ^d	Priority 3: • Draft in 2028 • Adopt in 2029
Notes: - CAPCOA Handbook, 2024 - City of Coronado CAP, 2022 - Sacramento County CAP, 2024 - San Bernardino County Regional GHG Reduction Plan Update, 2022 - San Diego County CAP, 2024 - Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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.

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 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 measure would begin to yield benefits.

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.

Table 3-26
SBCOG Off Road Transportation and Equipment Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Off Road-1	Electric-Powered Construction Equipment	Individual jurisdiction governments, SCAQMD, and Mojave Desert Air Quality Management District	The authority to implement the electrification of construction equipment, including ordinances, permitting, and incentives—rests with a combination of local departments and state agencies. Within local governments, Planning Departments can adopt ordinances requiring new construction equipment be electric, to phase out natural gas- and diesel-powered equipment. State agencies, including CalTrans and the Air District, could also oversee implementation.	State: - CARB - CalTrans Regional: - SCAQMD - SBCOG	Medium	\$201 to \$999 per MTCO ₂ e ^c	Priority 2: - Draft in 2027 - Adopt in 2028
Off Road-2	Idling Ordinance	Individual jurisdiction governments	Authority to implement an idling ordinance targeting off-road transportation, such as construction equipment, industrial vehicles, and yard trucks, rests with AQMDs, environmental health departments, and planning departments. AQMDs may set regional emissions standards and enforce anti-idling rules under state mandates like California's Airborne Toxic Control Measures, health departments may monitor compliance, and planning departments may incorporate idling restrictions into conditions of approval for development projects. Local governments also have the authority to adopt municipal ordinances to limit idling time and reduce localized air pollution and GHG emission.	State: - CARB Regional: - SCAQMD - SBCOG	Medium	Net Benefit	Priority 2: - Draft in 2027 - Adopt in 2028

Table 3-26
SBCOG Off Road Transportation and Equipment Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO _{2e})	Implementation Milestones
Off Road-3	Electric Landscaping Equipment	Individual jurisdiction governments	The authority to implement the electrification of construction equipment, including ordinances, permitting, and incentives—rests with a combination of local departments and state agencies. Within local governments, Planning Departments can adopt ordinances requiring new construction equipment be electric, to phase out natural gas- and diesel-powered equipment. State agencies, including CalTrans and the Air District, could also oversee implementation.	State: • CARB Regional: • SCAQMD • SBCOG	Medium	\$201 to \$999 per MTCO _{2e} ^e	Priority 2: • Draft in 2027 • Adopt in 2028
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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.

Table 3-27
SBCOG Waste Diversion Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Waste-1	Waste Diversion	Individual jurisdiction governments and waste service providers	City, county, or special districts that provide solid waste collection services have authority to implement waste diversion programs and infrastructure.	State: CalRecycle	High	>\$1,000 per MTCO ₂ e ^d	Priority 3: - Draft in 2028 - Adopt in 2029
Notes: m. CAPCOA Handbook, 2024 n. City of Coronado CAP, 2022 o. Sacramento County CAP, 2024 p. San Bernardino County Regional GHG Reduction Plan Update, 2022 q. San Diego County CAP, 2024 r. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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.

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.

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).

Table 3-28
SBCOG Water Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e) ^d	Implementation Milestones
Water-1	Require Adoption of Voluntary CalGREEN Water Efficiency Measures for New Construction	Individual jurisdiction governments	The authority to require the adoption of voluntary CalGREEN water efficiency measures for new construction lies with local governments and their Building and Planning Departments. Local governments may adopt these voluntary measures as “reach codes” through ordinance, making them mandatory within their jurisdiction. Building Departments enforce compliance through plan review and permitting, while Planning Departments may integrate these standards into broader sustainability goals for new development.	Regional: SBCOG	Medium	>\$1,000 per MTCO ₂ e ^d	Priority 2: - Draft in 2027 - Adopt in 2028
Water-2	Require Adoption of Voluntary CalGREEN Water Efficiency Measures for Existing Buildings	Individual jurisdiction governments	The authority to require the adoption of voluntary CalGREEN water efficiency measures for existing buildings lies with local governments and their Building and Planning Departments. Local governments may adopt these voluntary measures as “reach codes” through ordinance, making them mandatory within their jurisdiction. Building Departments enforce compliance through plan review and permitting, while Planning Departments may integrate these standards into broader sustainability goals for existing buildings.	Regional: SBCOG	High	>\$1,000 per MTCO ₂ e ^d	Priority 3: - Draft in 2028 - Adopt in 2029

Table 3-28
SBCOG Water Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Water-3	Encourage Water-Efficient Landscaping Practices	Individual jurisdiction governments and water retailers	Where grant funding or partnership with utilities is identified, cities can implement water efficient landscaping practices and programs and provide educational materials to support water efficient landscaping practices.	Regional: SBCOG	Low	Ranges from net benefit to >\$1,000 per MTCO ₂ e ^f	Priority 1: - Draft in 2026 - Adopt in 2027
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Local Measures – Wastewater 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 (VWWA) 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.

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.

Table 3-29
SBCOG Wastewater Treatment and Discharge Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Wastewater-1	Methane Recovery	Wastewater treatment plants	The local agency or department that owns and operates the wastewater treatment plant (e.g., a city's Public Works Department or a sanitation district) has the direct authority to plan and implement equipment upgrades. These agencies can apply for funding or technical support through utilities or other agencies such as SoCalREN and CEC, or other state programs.	Federal: - EPA Regional: - SoCalREN	High	>\$1,000 per MTCO ₂ e ^f	Priority 3: - Draft in 2028 - Adopt in 2029
Wastewater-2	Equipment Upgrades	Wastewater treatment plants	The local agency or department that owns and operates the wastewater treatment plant (e.g., a city's Public Works Department or a sanitation district) has the direct authority to plan and implement equipment upgrades. These agencies can apply for funding or technical support through utilities or other agencies such as SoCalREN and CEC, or other state programs.	Regional: SoCalREN	Medium	\$201 to \$999 per MTCO ₂ e ^e	Priority 2: - Draft in 2027 - Adopt in 2028
Notes: - CAPCOA Handbook, 2024 - City of Coronado CAP, 2022 - Sacramento County CAP, 2024 - San Bernardino County Regional GHG Reduction Plan Update, 2022 - San Diego County CAP, 2024 - Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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 N₂O 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.

Table 3-30
SBCOG Agriculture Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Agriculture-1	Methane Capture at Large Dairies	Large dairies	Authority to implement capture at large dairies rests with the California Department of Food and Agriculture, the California Air Resources Board, and local Environmental Health Departments. Local Environmental Health Departments may regulate air and water quality impacts associated with digester operations. Public-private partnerships and utility interconnection support are also critical for integrating captured methane into renewable energy systems.	Federal: - EPA State: - CDFA	High	>\$1,000 per MTCO ₂ e ^f	Priority 3: - Draft in 2028 - Adopt in 2029
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

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 reflectivity. 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.

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.

Table 3-31
SBCOG Land Use and Urban Design Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Land Use-1	Promote Rooftop Gardens	Individual jurisdiction governments	Authority to promote and implement rooftop gardens rests with local Planning Departments, Building and Safety Departments, and Sustainability Offices, in coordination with state building code requirements. Planning Departments may encourage rooftop gardens through zoning incentives, density bonuses, or green building ordinances. Rooftop gardens require full plan review, permits, and inspections to insure compliance with load-bearing capacity, code fire access, and integration standards, which are overseen by Building Departments. Sustainability Offices may promote adoption through outreach, grants, and integration into climate strategies.	State: • CNRA	Low	\$201 to \$999 per MTCO ₂ e ^f	Priority 1: • Draft in 2026 • Adopt in 2027
Land Use-2	Urban Tree Planting	Individual jurisdiction governments	Authority to implement urban tree planting programs rests with local jurisdictions and departments such as public works, parks and recreation, planning, or sustainability. Local jurisdictions have the authority to develop plans and policies that support urban forestry. Planning departments have authority over municipal codes or development standards that can encourage tree planting in new/existing developments.	State: • Cal Fire • CNRA	Low	\$201 to \$999 per MTCO ₂ e ^e	Priority 1: • Draft in 2026 • Adopt in 2027

Table 3-31
SBCOG Land Use and Urban Design Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
Notes: a. CAPCOA Handbook, 2024 b. City of Coronado CAP, 2022 c. Sacramento County CAP, 2024 d. San Bernardino County Regional GHG Reduction Plan Update, 2022 e. San Diego County CAP, 2024 f. Derived from multiple sources Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Local Measures – GHG Performance Standard

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-1 percent 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.

Table 3-32
SBCOG GHG Performance Standard Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
PS-1	GHG Performance Standard for New Development	Individual jurisdiction governments	The authority to implement GHG performance standards for new development rests with local Planning and Building Departments. Local governments may adopt GHG thresholds or performance standards through general plans or zoning ordinances, often aligned with CEQA guidelines.	N/A	Medium	N/A	Priority 2: - Draft in 2027 - Adopt in 2028

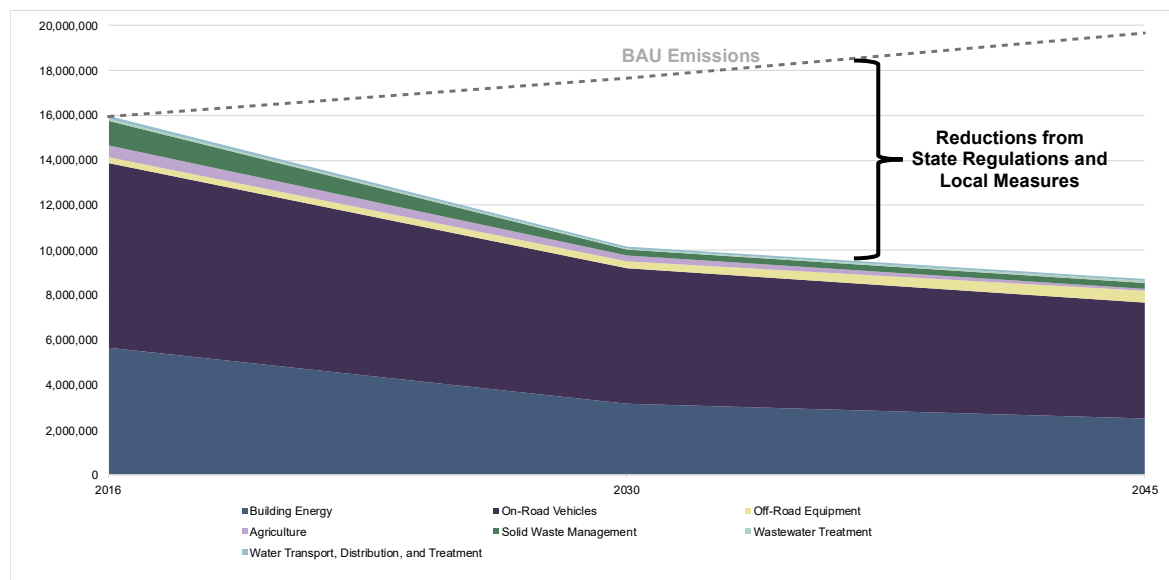
Accounting for Local Measures

Through state regulations and locally implemented measures, GHG emissions across SBCOG cities are expected to be reduced to approximately 1,634,078 MTCO₂e annually by 2030, and 1,472,664 MTCO₂e annually by 2045, as shown in **Table 3-33**.

Figure 3-7 shows graphically the BAU forecast, the effect of state and local measures, and the gap that must be filled by reductions from local measures for the SBCOG subregion to achieve state-aligned targets for 2030 and 2045.

Table 3-33		
SBCOG Cities: GHG Reductions Needed from Local Measures After Accounting for State and Local Measures (MTCO₂e/yr)		
	2030	2045
Business-as-Usual Forecast	17,674,452	19,652,360
Reductions from State Measures	5,893,212	9,478,645
Reductions from Local Measures	1,634,078	1,472,664
Remaining Emissions After State and Local Reductions	10,147,162	8,701,051
Absolute Emissions Target	9,583,346	2,555,559
Reductions Needed from Local Measures to Achieve Absolute Targets	563,816	6,145,491

Figure 3-7 SBCOG GHG Reductions from State Regulations and Local Measures 2030 and 2045 (MTCO₂e)



Additional reductions are needed from local measures in SBCOG cities to achieve reduction targets consistent with those mandated by the State of California. As described earlier (**Table 3-33**), when considering targets based on absolute reductions, the gap that must be closed by local measures is approximately 563,816 MTCO₂e per year by 2030 and 6,145,492 MTCO₂e per year by 2045.

The following sections describe how these targets can be achieved by evaluating what can feasibly be accomplished through implementation of local measures by 2030 and 2045. For 2030, the analysis is presented from two perspectives: 1) the SBCOG subregion as a whole; and 2) on a city-by-city basis for the 25 member cities of SBCOG, which accounts for the climate action

planning that each city has previously completed and assesses what may have to be adjusted to meet the targets.

Meeting GHG Reduction Targets

2030 Subregional Assessment

Throughout the development of SBCOG's GHG Reduction Plan, partnership jurisdictions identified actions that could become the basis of each jurisdiction's individual CAP. These actions include those mandated by the state, including the renewable portfolio standard, and those implemented individually by each jurisdiction, such as urban tree planting or waste diversion requirements. Through the combination of these actions, each jurisdiction and the region as a whole will be able to reduce GHG emissions. SBCOG does not have a subregion-wide GHG reduction target because jurisdictions identified individual reduction targets for 2030, and reduction targets for jurisdictions are diverse. Targets include a range of custom levels between 25 percent and 46 percent below 2008, 40 percent below 2016 GHG emission levels, 36 to 42 percent below 2020 BAU, or several per capita emissions levels. Given that reduction targets are only identified on a per jurisdiction basis, **Figure 3-8** shows that all jurisdictions will meet their specified reduction target with the actions identified, including state mandates, regional measures, and local actions.

Figure 3-8 2030 BAU GHG Emissions Forecast and Identified GHG Reductions in 2030 for SBCOG Jurisdictions

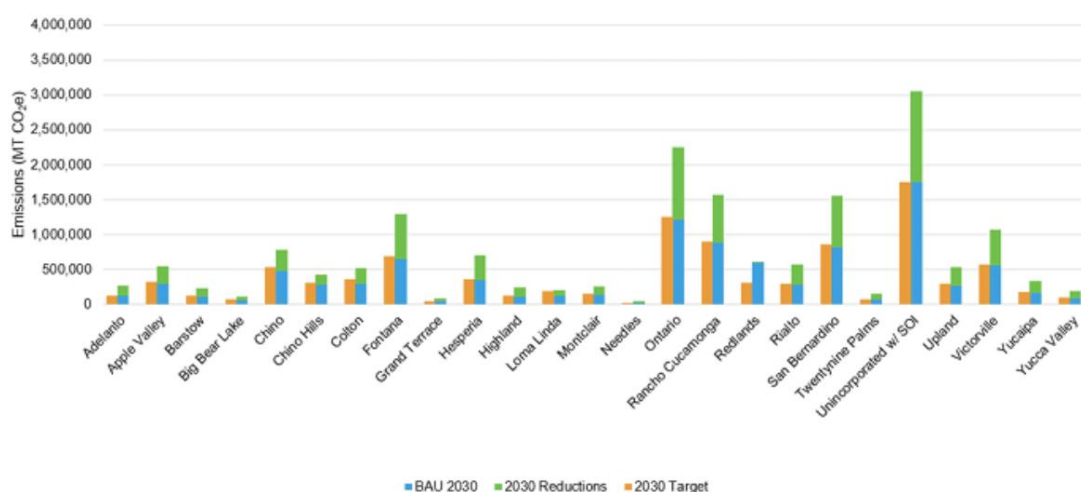


Table 3-34 below presents the emissions reduction targets for each jurisdiction and indicates whether they are expected to meet these targets. It is noteworthy that all SBCOG jurisdictions are projected to achieve their specified reduction targets with the actions outlined above.

Jurisdiction	Baseline Level	Planned 2030 Reductions (MTCO ₂ e)	Expect 2030 GHG Target to be Met?
Adelanto	2020 BAU	40%	Yes
Apple Valley	2005	40%	Yes
Barstow	2020 BAU	40%	Yes

Table 3-34
SBCOG Jurisdictions Baseline Level and Emissions Reductions Targets

Jurisdiction	Baseline Level	Planned 2030 Reductions (MTCO ₂ e)	Expect 2030 GHG Target to be Met?
Big Bear Lake	2008	32%	Yes
Chino	2008	46%	Yes
Chino Hills	2008	35.1%	Yes
Colton	2008	46%	Yes
Fontana	2008	46%	Yes
Grand Terrace	2020 BAU	42%	Yes
Hesperia	2020 BAU	40%	Yes
Highland	2016	40%	Yes
Loma Linda	2008	25%	Yes
Montclair	2016	42%	Yes
Needles	2020 BAU	35.9%	Yes
Ontario	2016	40%	Yes
Rancho Cucamonga	2016	40%	Yes
Redlands	2008	35.1%	Yes
Rialto	2016	40%	Yes
San Bernardino	2016	40%	Yes
Twentynine Palms	2008	46%	Yes
Upland	2016	40%	Yes
Victorville	2008	40%	Yes
Yucaipa	2008	46%	Yes
Yucca Valley	2020 BAU	40%	Yes
Unincorporated San Bernardino County	2020 BAU	40%	Yes

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

2045 Subregional Assessment

Achieving a 2045 GHG reduction target consistent with AB 1279 will require substantial reductions from local measures, with a focus on transportation and building energy efficiency measures. Partnership jurisdictions in SBCOG can do their part to be on track to meet the 2045 goal by implementing the following:

- Increase energy efficiency and green building efforts (for jurisdiction municipal buildings as well as private buildings in the region) to reach full zero net energy for both new development and existing development between 2030 and 2045.
- Continue to implement land use and transportation measures to lower VMT and shift travel modes.
- Capture all methane from landfills receiving regional waste, move toward zero waste and utilize landfill gas further as an energy source.
- Continue to improve local water efficiency and conservation.
- Continue to support and leverage incentive and rebate and other financing programs for residential and commercial energy efficiency and renewable energy installations to shorten payback period and costs and to develop programs that encourage increased use of small-scale renewable power as it becomes more economically feasible.

In addition, regional coordination will be vital to ensuring these GHG emission reduction strategies are implemented effectively across all communities in SBCOG. The conceptual effects of these strategies are presented in **Table 3-35** and would represent an approximate doubling of effort for most jurisdictions from that planned at the state and jurisdiction level for 2030. While the potential mix of future GHG reduction measures presented in this section is only an example,

it serves to demonstrate that the current measures in the CARB Scoping Plan and the Reduction Plan can not only move the region to its 2030 goal, but can also provide an expandable framework for much greater long-term GHG emissions reductions beyond 2030.

Table 3-35 Potential Regional Reduction Measures in SBCOG to Reach 2045 Goal (MTCO₂e)						
Sector	Reductions by 2030 (This Plan)				Scenario for Reductions by 2045	
	State	Local	TOTAL	% below 2016	Additional Reductions Needed for 2030–2045	Effort Relative to 2020–2030 (%)
Building Energy (Residential, Commercial, Industrial)	2,618,157	931,841	3,549,998	63%	3,097,785	87%
On-Road Transportation	2,690,435	246,072	2,936,507	36%	6,018,701	205%
Off-Road Transportation and Equipment	NA	13,526	13,526	8%	328,111	2,426%
Solid Waste Management	584,621	356,035	940,655	91%	293,807	31%
Agriculture	NA	3,754	3,754	<1%	81,005	2,158%
Wastewater Treatment	NA	15,551	15,551	6%	78,835	507%
Water Conveyance	NA	90,025	90,025	50%	146,037	162%
GHG Performance Standard for New Development	NA	230,315	230,315	NA	Not estimated	Not estimated
TOTAL	5,893,212	1,919,770	7,812,982	64%	9,861,470	126%
NOTES: NA – Not applicable.						

WRCOG Measures

The PCAP presented a compendium of climate action planning that has occurred recently in the WRCOG subregion, including WRCOG’s 2022 Subregional CAP (covering 13 cities) and seven local CAPs that have been developed by local jurisdictions over the past ten to fifteen years. The PCAP summarized these plans and aggregated their GHG measures under the sectors of Energy, Transportation, Solid Waste, Water & Wastewater, and Agriculture. The seven existing local CAPs were reviewed for consistency with WRCOG’s 2022 Subregional CAP, which identified three local measures not included in the 2022 Subregional CAP.⁶⁸ As such, the PCAP⁶⁹ identified five state measures, three regional measures, and fifteen local measures to represent the range of GHG measures encountered in existing plans in the WRCOG subregion.⁷⁰ Although the PCAP included a rough estimate of how the implementation of all existing CAPs in the subregion would reduce emissions by the year 2030, the results are considered preliminary, due to the inconsistencies and variabilities used by the various plans in developing emissions baselines, regulatory assumptions, and emissions quantification methods.

Furthermore, the analysis of existing CAPs as provided in the PCAP did not demonstrate how the WRCOG subregion could achieve reductions consistent with California’s mandated statewide

⁶⁸ WRCOG, 2022

⁶⁹ SBCOG, 2024

⁷⁰ See Table 4-21 of the PCAP

targets as represented by AB 32 and SB 1279. The 2022 WRCOG Subregional CAP demonstrated that just 4 of the 13 participating cities (Banning, Beaumont, Canyon Lake, and Lake Elsinore) would achieve a 2030 target consistent with California’s statewide target (see PCAP, Table 2-8). And at least one of the CAPs developed individually for the remaining cities did not demonstrate quantitatively how a 2030 target could be met (for the City of Riverside, though that city is currently in the process of updating its CAP). For the purposes of the CCAP, a fresh analysis was completed to determine the reductions needed from state, regional and local measures for the WRCOG subregion to achieve targets consistent with SB 32 (for 2030) and AB 1279 (for 2045).

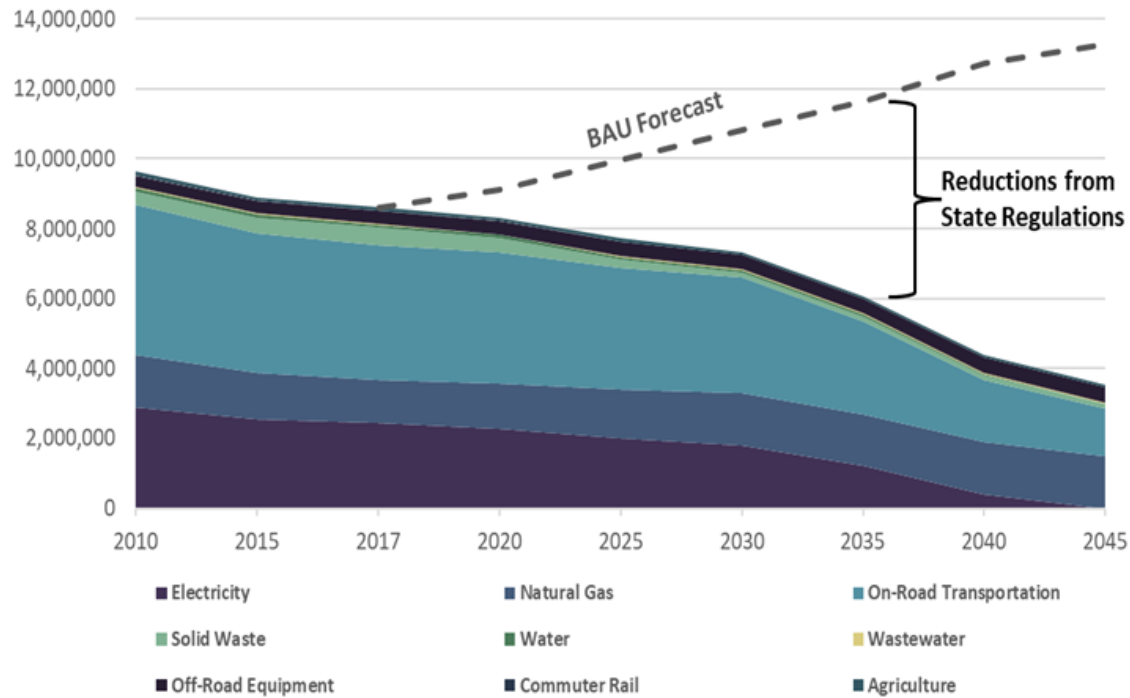
The analysis for the CCAP starts with state measures, then examines regional measures, and concludes with identifying what must be accomplished through locally implemented measures for the WRCOG subregion to reduce emissions consistent with state targets. The analysis describes how the WRCOG cities as a region can meet state-aligned targets for 2030 and 2045 but does not prescribe what individual jurisdictions must commit to. Each city is examined for its ability to achieve these targets based on commitments outlined in their current local CAP or their participation in the 2022 WRCOG Subregional CAP. For those cities that are not currently demonstrating alignment with state targets, the challenges and opportunities for target achievement are identified, including specific reduction measures and performance recommendations.

Accounting for State Measures

The effect of statewide standards and regulations on the subregion’s 2030 and 2045 emissions forecasts is summarized in **Table 3-36**; the collective effect of these forecasts for the subregion is depicted in **Figure 3-9**. By 2030, statewide standards and regulations are expected to reduce community emissions by approximately 3,466,891 MTCO₂e per year, or an estimated 32 percent from the BAU forecast. By 2045, statewide measures are expected to reduce community emissions by approximately 9,745,903 MTCO₂e per year, or an estimated 73 percent from the BAU forecast. As shown in **Figure 3-9**, with state-imposed regulations, the emissions are expected to decrease through the year 2045, compared to the BAU forecast that shows an increase over the same period. Methods used to quantify reductions are included in Appendix B.

Table 3-36		
WRCOG Cities: GHG Reductions from State Measures (MTCO₂e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SE-1: Renewables Portfolio Standard (RPS)	1,336,195	4,157,992
SE-2: California Building Energy Efficiency Standards (Title 24, Part 6)	155,294	407,659
Transportation and Land Use		
ST-1: Pavley/Advanced Clean Cars II; Low Carbon Fuel Standard (LCFS)	1,518,296	4,679,848
Solid Waste		
SR-1: State Recycling and Waste Diversion Mandates	442,350	500,404
Water and Wastewater		
SW-1: Water Conservation Mandates	14,756	0
Total Reduction from State Measures	3,466,891	9,745,903
Note: Totals may not add up due to rounding.		

Figure 3-9 WRCOG Subregion: Community GHG Emissions After Accounting for State Measures, by Sector (MTCO₂e/year) – All Cities Combined



State programs typically require action at the local level 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.

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 generally require local participation but do not require local administration to achieve GHG reductions. All regional measures considered for the CCAP are aimed at reducing emissions from the transportation sector. This includes the Goods Movement Decarbonization measure that was presented in the PCAP as a priority regional measure. Descriptions of these measures are provided in the following paragraphs.

Accounting for Regional Measures

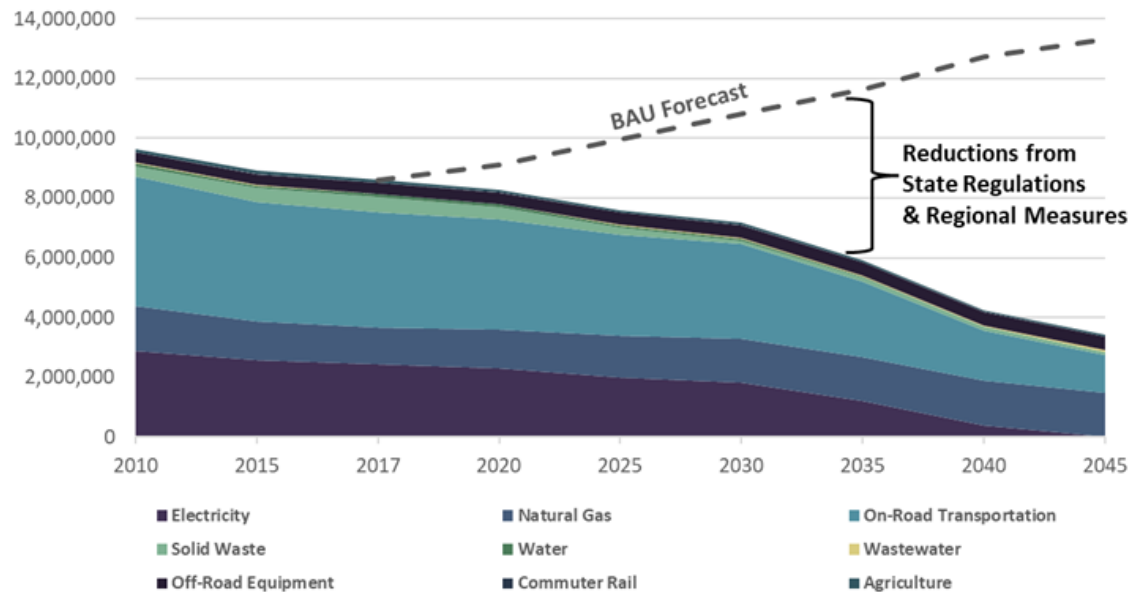
Table 3-37 lists the regional measures that were analyzed for the CCAP along with estimated total annual GHG reductions anticipated for each measure across the WRCOG subregion by the

years 2030 and 2045. **Figure 3-10** shows graphically the impact that regional measures will have on the subregion's emissions. Methods used to quantify reductions from regional measures are included in Appendix B.

Regional Transportation Measures		2030 Reduction Potential	2045 Reduction Potential
RT-1	Metrolink Expansion	6,436	2,493
RT-2	Regional Transportation Demand Management	53,647	27,297
RT-3	Goods Movement Decarbonization	104,194	85,901
Total Regional Reductions		164,277	115,691

Note: Totals may not add up due to rounding.

Figure 3-10 WRCOG Subregion: Community GHG Emissions After Accounting for State and Regional Measures, by Sector (MTCO₂e/year) – All Cities Combined



RT-1: Metrolink Expansion

Provide 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.

RT-2: Regional 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.

RT-3: Decarbonize Goods Movement

Provide supporting infrastructure to expand the adoption of electric and hydrogen-powered trucks.

Note: this measure was included in the PCAP and was incorporated into a CPRG Implementation grant application by the South Coast Air Quality Management District (AQMD). In July 2024, the agency was awarded a \$500M grant to fund their INVEST CLEAN program transitioning the Southern California goods movement and logistics corridor to zero emission (ZE) technologies.⁷¹

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, 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 priority populations.

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,

⁷¹ More information on INVEST CLEAN available at:
<https://www.aqmd.gov/home/technology/implementation/investclean>

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. 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 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. The INVEST CLEAN grant will support the deployment of hydrogen filling stations and multi-megawatt electric charging at truck stops, provide incentives for private fleet vehicle electrification, and install mechanisms to electrify cargo handling equipment. Through the decarbonization of goods movement infrastructure, the WRCOG subregion (and the MSA as a whole) 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.

Table 3-37 summarizes the GHG reductions expected in the WRCOG subregion from the implementation of the INVEST CLEAN program.

Zero-Emissions Trucks Regulations

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

Through state regulations and regionally implemented measures, GHG emissions across WRCOG cities are expected to be reduced to approximately 7,171,291 MTCO₂e annually by 2030, and 3,428,230 MTCO₂e annually by 2045, as shown in **Table 3-38**. The additional reductions needed from local measures to achieve reduction targets consistent with those mandated by the State of

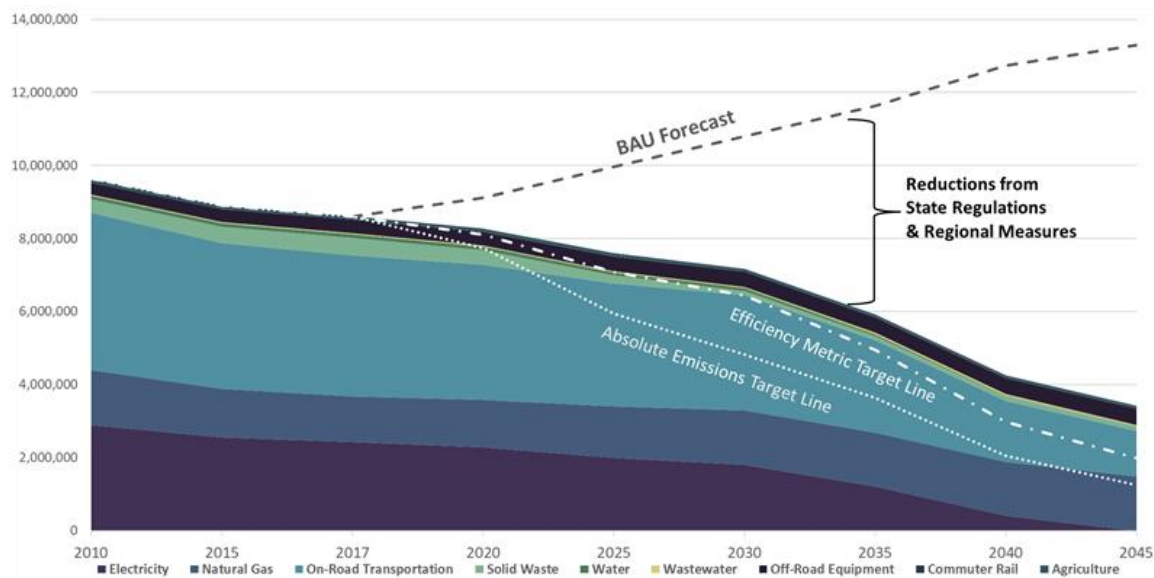
California is also depicted in **Table 3-38**, indicating that for 2030, reductions of approximately 2,352,538 MTCO₂e per year by 2030 and 2,175,354 MTCO₂e per year by 2045 will be needed regionally to achieve targets derived using an absolute emissions basis, and reductions of approximately 735,676 MTCO₂e per year by 2030 and 1,436,756 MTCO₂e per year by 2045 will be needed to achieve targets derived using a per-capita emissions basis.

Figure 3-11 shows graphically the BAU forecast, the effect of state and regional measures, and the gap that must be filled by reductions from local measures for the WRCOG subregion to achieve state-aligned targets for 2030 and 2045.

Table 3-38		
WRCOG Cities: GHG Reductions Needed from Local Measures After Accounting for State and Regional Measures (MTCO₂e/yr)		
	2030	2045
Business-as-Usual Forecast	10,802,459	13,289,824
Reductions from State Measures	-3,466,891	-9,745,903
Reductions from Regional Measures	-164,277	-115,691
Remaining Emissions After State and Regional Reductions	7,171,291	3,428,230
Absolute Emissions Target	4,818,753	1,252,876
Reductions Needed from Local Measures to Achieve Absolute Targets	2,352,538	2,175,354
Efficiency Metric Target	6,435,615	1,991,474
Reductions Needed from Local Measures to Achieve Efficiency Metric Targets	735,676	1,436,756

Note: Totals may not add up due to rounding.

Figure 3-11 WRCOG Cities: Reductions Needed from Local Measures (MTCO₂e)



This section describes the local measures available to WRCOG cities for reducing measures across the sectors of Energy, Transportation, Solid Waste, Water, and Agriculture, followed by estimates of reductions that can feasibly be achieved by these measures by the year 2030. **Table 3-39** lists these local measures and identifies where they can be found in the existing CAPs in the

WRCOG subregion, including WRCOG 2022 Subregional CAP.⁷² In some cases, the measures from 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.

Table 3-39
Local GHG Reduction Measures – WRCOG Cities

ID	CCAP Measure	Sources (see Key below)
Energy		
LE-1	Expand Local Renewable Energy Production & Storage	1,3,5,6,7
LE-2	Community Choice Energy/Green Grid Offerings	1,3,6,7
LE-3	Improve Energy Efficiency of Existing Buildings	1,3,5,6,7
LE-4	Building and Appliance Electrification	1,5,6
LE-5	Traffic & Street Light Upgrades	1,5,7
LE-6	Shade Trees	1,3,6,7
LE-7	Cool Roofs and Pavements	2,3,4,5
LE-8	Reach Codes for New Buildings – Going Beyond Title 24	5,6
Transportation		
LT-1	Bicycle Infrastructure Improvements	1,3,5,6,7
LT-2	Pedestrian Infrastructure Improvements	1,3,5,6,7
LT-3	Car Share & Carpool Programs	1,5,6,7
LT-4	Parking Pricing and Limited Requirements	1,3,6
LT-5	Increased Transit Service and Frequency	1,5,6,7
LT-6	Traffic Signal Coordination and Calming Measures	1,6,7
LT-7	Increased Housing Density	1,5,6,7
LT-8	Increased Land Use Diversity	1,5,6
LT-9	Transit-Oriented Development	1,5,6,7
LT-10	Expanded ZEV Infrastructure and ZEV Purchases	1,5,6,7
LT-11	Subsidized Transit	1,6,7
LT-12	Congestion Pricing/Express Lanes	7
Solid Waste		
LR-1	Zero Waste Initiatives (exceed state mandates)	1,3,6,7
Water		
LW-1	Increased Recycled Water Use	1,3,5
Agriculture		
LA-1	Local Agriculture & Community Gardens	1,7
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) NA – Not included in 2022 WRCOG Subregional CAP NQ – Not quantified in 2022 WRCOG Subregional CAP		

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.*

⁷² Note that the measure identifications used for the CCAP measures match those included in the PCAP and are based on those used in the 2022 Subregional CAP, with the exception of LE-7, LE-8, and LT-12, which were not included in the 2022 Subregional CAP but can be found in some local CAPs, as noted.

- *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.

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 (Title 24, Part 6 of the 2022 California Building Energy Efficiency Standards).

LE-2: Community Choice/Green Grid Offerings

Create or join a Community Choice Aggregation (CCA) program, offer clean electricity options (municipally owned utilities), 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 in to cleaner electricity sources.

This measure goes beyond state mandates for renewables content of grid electricity (e.g., SB 100 and SB 1020). 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 Cities of Banning, Moreno Valley, and Riverside have municipally-owned utilities with their own goals for renewables. Banning is served by Banning Electric Utility, a publicly owned utility (POU) that had already attained 81 percent renewables by 2022.⁷³ Riverside Public Utility (RPU) is forecasting 65 percent renewable energy generation by 2030,⁷⁴ while Moreno Valley Electric

⁷³ City of Banning, n.d.

⁷⁴ Riverside Public Utilities, n.d.

Utility (MVU) aims to achieve 50 percent renewables by 2030, consistent with California's Senate Bill 100.⁷⁵

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 Electric Utility (MVU), 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.

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.

⁷⁵ Moreno Valley Electric Utility, 2025

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 for a while been transitioning 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.

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.

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.

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.

For the CCAP, measure LE-8 is included as a supporting measure that is not quantified for GHG emissions reductions to avoid double counting associated with Measures LE-4 (Building and Appliance Electrification)

Table 3-40
WRCOG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
LE-1	Expand Local Renewable Energy Production & Storage	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Authority over building permits for new development and where grant funding or partnership with utilities is identified can implement incentives. Where grant funding or partnership with utilities is identified can implement incentives	SCE Programs Commercial solar firms CEF EoAP LIWP	Low	Net Benefit	Priority 2: • Draft in 2027 • Adopt in 2028
LE-2	Community Choice Energy/Green Grid Offerings	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Under California's Community Choice Aggregation law (AB 117, 2002), cities and counties can form or join a Community Choice Energy (CCE) program. Once a jurisdiction joins a CCE, residents and businesses are automatically enrolled in the program by default, unless they choose to opt out. The local government must hold public hearings, adopt an ordinance or resolution authorizing participation, and notify customers in advance and provide opt-out options.	CalChoice is a Joint Powers Authority (JPA) that helps cities form and operate CCAs: https://cal-cca.org/about/	Low (utility offerings) to High (CCE)	Net Benefit	Priority 2: • Draft in 2027 Adopt in 2028
LE-3	Improve Energy Efficiency of Existing Buildings	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Cities can promote and encourage retrofits and appliance upgrades working with utilities and where grant funding is identified can implement incentives. Cities can promote and encourage smart thermostats working with utilities and where grant funding is identified can implement incentives. Where grant funding or partnership with utilities is identified can implement incentives	SCE incentives EECBG EECBD	Medium	Net Benefit	Priority 1: • Draft in 2026 • Adopt in 2027
LE-4	Building and Appliance Electrification	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, San Jacinto, Temecula, Wildomar, County of Riverside,	Authority over building permits for new development and where grant funding or partnership with utilities is identified can implement incentives. Cities can promote and encourage appliance upgrades working with utilities and where grant funding is identified can implement incentives.	CMAQP EECBG SCE & SCG Incentives EBDP	Low (appliances) to High (buildings)	<\$200 per MTCO ₂ e (appliances) ^f > \$1,000 per MTCO ₂ e (buildings) ^f	Priority 2: • Draft in 2027 • Adopt in 2028

Table 3-40
WRCOG Energy Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e ^f)	Implementation Milestones
LE-5	Traffic & Street Light Upgrades	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Local governments have the authority to implement traffic and street light upgrades, with responsibility shared among public agencies and city departments, depending on jurisdiction and infrastructure ownership. Typically, Public Works or Traffic Engineering departments are responsible for traffic and street lighting within city limits; In City of Riverside, RPU owns and operates the street lighting system.	CEC WRCOG	Low	\$201 - \$999 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
LE-6	Shade Trees	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Local jurisdictions have authority over plans and policies that support urban forestry. They also have authority over municipal codes or development standards that can encourage tree planting in new/existing developments.	CalFire Urban and Community Forestry Grant Program	Medium	\$201 - \$999 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
LE-7	Cool Roofs and Pavements	Beaumont, Corona, Lake Elsinore, Moreno Valley, County of Riverside	Authority over building permits for new development and where grant funding or partnership with utilities is identified can implement incentives for existing/new development.	SCE incentives EBDP	Medium	Net Benefit	Priority 2: • Draft in 2027 • Adopt in 2028
LE-8	Reach Codes for New Buildings – Going Beyond Title 24	Moreno Valley, Murrieta	Local jurisdictions can adopt reach codes, including zero net energy (ZNE) standards ahead of revisions to Title 24 regulations. Many cities across California have passed or they are considering standards that effectively eliminate the use of natural gas in new buildings or require the electrification of heating and cooling systems and appliances.	CEC	High	\$201 - \$999 per MTCO ₂ e ^c	Priority 1: • Draft in 2026 • Adopt in 2027

Notes:

- CAPCOA Handbook, 2024
- City of Coronado CAP, 2022
- Sacramento County CAP, 2024
- San Bernardino County Regional GHG Reduction Plan Update, 2022
- San Diego County CAP, 2024
- Derived from multiple sources

Potential Funding:

See Appendix D for a full list of acronyms and funding programs.

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.

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.

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.

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.

LT-5: Increased 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.

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.

LT-7: Increased 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-8 and LT-9 that promote land use diversity and transit-oriented development.

LT-8: Increased 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.

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.

LT-10: Expanded ZEV Infrastructure and ZEV Purchases

Accelerate the transition to Zero Emission Vehicles (ZEVs).

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, tax credits, and state and air district rebates have contributed to an expanding market for ZEVs.

California leads the nation in transitioning to ZEVs, 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 (including plug-in hybrids) approximately 5 percent of all vehicles on the road as of 2023, according to the California Energy Commission.⁷⁶

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. 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.

This measure supports the expansion of zero emission vehicles (ZEVs) through local fleet vehicle transitions and expansion of supporting publicly accessible 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 in government fleets.

⁷⁶ CEC, 2021

- 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.
- 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.

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.

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 3-41
WRCOG Transportation Measure Implementation Considerations

Measure Ref	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
LT-1	Bicycle Infrastructure Improvements	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Local governments in California have authority over land use. Planning Departments play a key role in aligning infrastructure improvements with broader land use and climate goals, and in developing municipal codes, pilot programs, and permitting processes that may be needed for implementation; City Planning, Public Works, and Transportation Departments. Public Works Departments often lead the design and construction of bicycle lanes and micromobility infrastructure (like e-scooter parking zones), and related street improvements; Transportation Departments (or divisions within Public Works) are responsible for planning and managing mobility systems, including bike lanes, traffic calming, and micromobility integration.	Federal: - US DOT State: - Caltrans - CalSTA Regional SBCTA, CVAG, WRCOG	Medium	\$201 to \$999 per MTCO ₂ e ^c	Priority 2: - Draft in 2027 - Adopt in 2028
LT-2	Pedestrian Infrastructure Improvements	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Local governments in California have authority over land use. Planning Departments play a key role in aligning infrastructure improvements with broader land use and climate goals, and in developing municipal codes, pilot programs, and permitting processes that may be needed for implementation; Public Works Departments often lead the design and construction of pedestrian corridors and related street improvements; Transportation Departments (or divisions within Public Works) are responsible for planning and managing active transportation systems, including sidewalks and pathways, traffic calming, and other safety measures.	Federal: - US DOT State: - Caltrans - CalSTA Regional SBCTA, CVAG, WRCOG	Medium	\$201 to \$999 per MTCO ₂ e ^c	Priority 2: - Draft in 2027 - Adopt in 2028
LT-3	Car Share & Carpool Programs	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	City Public Works or Transportation Departments typically lead TDM efforts, which include carpool and car share programs. Responsibilities can range from managing parking supply and prioritizing carpool and clean vehicle spaces, implementing ordinances that incentivize developers to include car share vehicles and memberships in new developments, and supporting pilot programs for carsharing in multifamily housing. ⁷⁷	State: - CalTrans Regional - SBCTA, CVAG, WRCOG	Low	\$201 to \$999 per MTCO ₂ e ^b	Priority 1: - Draft in 2026 - Adopt in 2027
LT-4	Parking Pricing and Limited Requirements	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris,	City Planning Departments lead the development and enforcement of zoning codes and parking requirements. They can set maximum parking limits for new developments, require unbundled parking (separating parking costs from rent), and implement parking cash-out programs and Transportation	Regional SBCTA, CVAG, WRCOG	High	\$201 to \$999 per MTCO ₂ e ^f	Priority 2: - Draft in 2027 - Adopt in 2028

Table 3-41
WRCOG Transportation Measure Implementation Considerations

Measure Ref	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
		San Jacinto, Temecula, Wildomar, County of Riverside	Demand Management (TDM) policies. City Public Works or Transportation Departments typically manage parking infrastructure, including meters, curb space, and permit programs.				
LT-5	Increased Transit Service and Frequency	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside,	Generally, the authority to increase transit service and frequency is shared among local city departments, local and regional transit services, regional transportation authorities, and state-level agencies. In Western Riverside County, Riverside Transit Agency (RTA) develops Short Range Transit Plans (SRTPs) to guide service improvements and expansions. It also operates regional transit services and coordinates with municipal transit systems in cities like Corona, Beaumont, Banning, and Riverside. The Riverside County Transportation Commission (RCTC) manages funding, planning, and coordination across agencies and jurisdictions. RCTC manages Measure A funds and SB 1 allocations. ⁷⁸	Federal: • US DOT • IJJA State: • CARB • CalTrans • CalSTA	High	Ranges from net benefit to >\$1000 per MTCO ₂ e ^a	Priority 1: • Draft in 2026 • Adopt in 2027
LT-6	Traffic Signal Coordination and Calming Measures	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside San Jacinto, Temecula, Wildomar	Implementation is shared among local city departments, Riverside County Transportation Commission (RCTC), and Caltrans depending on jurisdiction and roadway ownership.	Federal: • US DOT State: • CalTrans	Medium	\$201 to \$999 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
LT-7	Increased Housing Density	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside	City Planning Departments are the lead agencies for zoning changes, land use amendments, and housing element updates. They have the authority to amend zoning codes to allow higher density, streamline permitting processes, implement nonfinancial incentives like density bonuses and reduced parking requirements. They can also steer development through specific plan updates and General Plan	Federal: • HUD State: • SCG	High	Ranges from net benefit to >\$1000 per MTCO ₂ e ^f	Priority 1: • Draft in 2026 • Adopt in 2027

⁷⁷ Trip Reduction & TDM | Cool California

⁷⁸ How RCTC Funds and Plans Local Transit Improvement - RCTC

Table 3-41
WRCOG Transportation Measure Implementation Considerations

Measure Ref	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
			amendments. At the state level, California Department of Housing and Community Development (HCD) oversees compliance with housing element law and RHNA (Regional Housing Needs Allocation) requirements. HCD enforces housing laws and can revoke housing element certification if jurisdictions fail to comply. HCD also administers funding programs like the Infill Infrastructure Grant Program and Affordable Housing and Sustainable Communities Program. Regional Councils of Government (COGs) help allocate RHNA targets and coordinate regional planning efforts. COGs work with HCD to ensure housing elements reflect regional needs and climate goals.				
LT-8	Increased Land Use Diversity	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Murrieta, Norco, Perris, San Jacinto, Temecula, Wildomar	Local government planning departments have the authority to: • update General Plans and Specific Plans to allow mixed-use development; • amend zoning codes to permit a broader range of uses in targeted area; • streamline permitting processes for infill and mixed-use projects; • offer nonfinancial incentives like reduced parking requirements or expedited review Most land-use changes in California are subject to public input and CEQA review but can be streamlined for some infill and mixed-use projects under certain conditions development projects. They must also be approved or adopted by City Councils and Boards of Supervisors.	Federal: • HUD State: • SCG • HCD	High	>\$1000 per MTCO ₂ e ^f	Priority 2: • Draft in 2027 • Adopt in 2028
LT-9	Transit-Oriented Development	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside	Similar to increasing Land Use Diversity, Local government planning departments have the authority to: • amend General Plans, Specific Plans, and Zoning Codes to allow TOD. • define high-quality transit areas • streamline permitting and offer nonfinancial incentives to developers	Federal: • HUD State: • SCG • HCD • Caltrans	High	Ranges from net benefit to >\$1000 per MTCO ₂ e ^a	Priority 1: • Draft in 2026 • Adopt in 2027

Table 3-41
WRCOG Transportation Measure Implementation Considerations

Measure Ref	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
			require TOD-supportive design features like pedestrian access, bike infrastructure, and reduced parking Most land-use changes in California are subject to public input and CEQA review but can be streamlined for some infill and mixed-use projects under certain conditions development projects. They must also be approved or adopted by City Councils and Boards of Supervisors.				
LT-10	Expanded ZEV Infrastructure and ZEV Purchases	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar, County of Riverside	The authority to expand publicly accessible EV charging infrastructure—including ordinances, permitting, and incentives—rests with a combination of local departments, state agencies, and utility partnerships. Within local governments, Planning Departments can adopt ordinances requiring EV infrastructure in new developments and designate zoning for EV-friendly uses; Building and Safety Departments are typically responsible for issuing permits and conducting inspections for EV charging installations; and Public Works or Transportation Departments many manage public right-of-way installations, parking designations, and fleet electrification. The authority to transition city owned and managed fleets rests within the local government itself. AB 1236 (2015) and AB 970 (2021) require all California cities and counties to adopt streamlined permitting ordinances for EV charging stations.	Federal - NEVI program State: - SCE - CARB - CEC's Clean Transportation Program⁷⁹ - CEC's CALeVIP⁸⁰ Regional - IREN/Clean Cities	Medium	Ranges from net benefit to >\$1000 per MTCO ₂ e, depending on project ^a	Priority 1: - Draft in 2026 - Adopt in 2027
LT-11	Subsidized Transit	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar	The authority to implement subsidized transit is wide-ranging, and includes local governments, private businesses, public transit agencies, educational institutions, and community organizations. The Inland Empire Commuter program, which consists of RCTC and SBCTA's Vanpool Programs provides services at no-cost to eligible Riverside	Federal: - DOT State: - CalTrans Regional	Low	>\$1000 per MTCO ₂ e ^a	Priority 1: - Draft in 2026 - Adopt in 2027

⁷⁹ <https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program>

⁸⁰ <https://calevip.org/about-calevip>

Table 3-41
WRCOG Transportation Measure Implementation Considerations

Measure Ref	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
			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.	SBCTA, CVAG, WRCOG			
LT-12	Congestion Pricing/Express Lanes	City of Riverside	Riverside County Transportation Commission (RCTC), the Congestion Management Agency for Riverside County, has the authority to implement congestion pricing and highway express lanes. RCTC operates the Riverside Express program, which includes express lanes that use dynamic congestion pricing to manage traffic flow and generate revenue for corridor improvements Caltrans collaborates with RCTC on express lane development and ensures compliance with CEQA and NEPA. ⁸¹	Federal: - DOT State: - CalTrans - CalSTA	High	\$201 to \$999 per MTCO ₂ e ^f	Priority 2: - Draft in 2027 - Adopt in 2028

Notes:

- CAPCOA Handbook, 2024
- City of Coronado CAP, 2022
- Sacramento County CAP, 2024
- San Bernardino County Regional GHG Reduction Plan Update, 2022
- San Diego County CAP, 2024
- Derived from multiple sources

Potential Funding:

See Appendix D for a full list of acronyms and funding programs.

⁸¹ <https://riversideexpress.com/about>

Supporting Measures for Solid Waste, Water, and Agriculture (Not Quantified)

Although considered important in supporting statewide actions, local measures for reducing GHG emissions from the Solid Waste, Water, and Agriculture sectors are not quantified for local implementation in the CCAP. This is because reductions for these sectors have been fully accounted for as state measures using implementation assumptions that are not likely to be exceeded at the local level. For example, state measure SR-1 (State Recycling and Waste Diversion Mandates) assumes that 75 percent of solid waste will be diverted from landfills statewide by 2030, and 90 percent of solid waste statewide will be diverted by 2045. These assumptions are in line with state policy, but chances are low that local jurisdictions would exceed these goals. Accordingly, no additional reductions are assumed for the following local measures that are intended to support the state in achieving its mandates and goals.

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 (GHG reductions associated with this mandate are accounted for under State Measure SR-1). 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.

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 WaterSmart program.

Note that actions to increase water conservation are covered by State Measure SW-1 (Water Conservation Mandates), which accounts for GHG reductions expected from the implementation of California Assembly Bill 1668 and Senate Bill 606, which require urban and agricultural water suppliers to enact new urban efficiency standards for indoor use, outdoor use, and water lost to leaks.

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.

For the CCAP, measure LA-1 is included as a supporting measure that is not quantified for GHG emissions reductions due to the factors mentioned above as well as the limited acreage available for local agriculture and community gardens within city boundaries and the resulting small impact that the measure has in affecting direct GHG emissions.

Table 3-42
Solid Waste, Water, and Local Agriculture Measure Implementation Considerations

Measure Ref #	Measure Title	Implementation Agencies	Authority to Implement	Potential Funding	Staff Effort	Cost-effectiveness Range (\$ per MTCO ₂ e)	Implementation Milestones
LS-1	Zero Waste Initiatives	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Murrieta, Norco, Perris, San Jacinto, Riverside, Temecula, Wildomar	City, county, or special districts that provide solid waste collection services have authority to implement waste diversion programs and organic waste collection services, including the procurement of waste management services, and collection systems that best suit the community. Local jurisdictions may implement ordinances to encourage responsible construction and demolition waste practices, and can also educate residents and businesses about waste reduction and recycling	State: CalRecycle	Medium	N/A – GHG reduction not quantified	Priority 2: - Draft in 2027 - Adopt in 2028
LW-1	Increased Recycled Water Use	Banning, Beaumont, Calimesa, Canyon Lake, Corona, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Moreno Valley, Norco, Perris, San Jacinto, Temecula, Wildomar	Where grant funding or partnership with utilities is identified can implement incentives to increase recycled water use both by consumers and water purveyors.	Regional: - SBCTA, CVAG, WRCOG - SoCalREN	Medium	N/A – GHG reduction not quantified	Priority 2: - Draft in 2027 - Adopt in 2028
LA-1	Local Agriculture & Community Gardens	Banning, Beaumont, Calimesa, Canyon Lake, Eastvale, Jurupa Valley, Lake Elsinore, Menifee, Norco, Perris, Riverside, San Jacinto, Temecula, Wildomar	Under AB 551, also known as the Urban Agriculture Incentive Zones Act, cities and counties can provide tax relief to landowners who agree to use vacant land for small-scale agricultural production.	State: CFDA	Medium	N/A – GHG reduction not quantified	Priority 2: - Draft in 2027 - Adopt in 2028
Potential Funding: See Appendix D for a full list of acronyms and funding programs.							

Accounting for Local Measures

Additional reductions are needed from local measures in WRCOG cities to achieve reduction targets consistent with those mandated by the State of California. As described earlier (**Table 3-38**) when considering targets based on absolute reductions, the gap that must be closed by local measures is approximately 2,352,538 MTCO₂e per year by 2030 and 2,175,354 MTCO₂e per year by 2045. When considering efficiency targets, local measures will need to contribute approximately 735,676 MTCO₂e per year by 2030 and 1,436,756 MTCO₂e per year by 2045.

The following sections describe how these targets can be achieved by evaluating what can feasibly be accomplished through implementation of local measures by 2030 and 2045. For 2030, the analysis is presented from two perspectives: 1) the WRCOG subregion as a whole; and 2) on a city-by-city basis for the 18 member cities of WRCOG, which accounts for the climate action planning that each city has previously completed and assesses what may have to be adjusted to meet the targets.

The following sections describe how these targets can be achieved by evaluating what can feasibly be accomplished through implementation of local measures by 2030 and 2045. For 2030, the analysis is presented from two perspectives: 1) the WRCOG subregion as a whole; and 2) on a city-by-city basis for the 18 member cities of WRCOG, which accounts for the climate action planning that each city has previously completed and assesses what may have to be adjusted to meet the targets.

Meeting GHG Reduction Targets

2030 Subregional Assessment

For the CCAP, quantitative modeling was completed to determine the GHG emissions reductions needed from local measures in the WRCOG subregion to achieve a state-aligned target for 2030. Although all of the local measures described in the previous section can reduce emissions, they range widely in terms of cost-effectiveness and feasibility of implementation, particularly in the near term. Accordingly, the assessment for 2030 focuses on a smaller set of measures that can feasibly be implemented by the year 2030 and that have significant reduction potential. The 2030 analysis is limited to the Energy and Transportation sectors which are by far the largest contributors to the region's emissions and the sectors that offer the greatest opportunity for local reductions. It should also be noted that while they play an important role in supporting state mandates and regulations, local measures addressing the Solid Waste and the Water & Wastewater sectors are not likely to result in reductions beyond what has already accounted for in the state measures addressing those sectors. For example, local action is needed to support the state's mandate to divert 75 percent of solid waste from landfills by 2030, but is not likely to result in GHG reductions going beyond what is already accounted for in state measure SR-1, at least in the near term. The agriculture sector represents less than 1 percent of total emissions forecasted for WRCOG cities in 2030; thus any reductions from this sector would not significantly affect the target analysis.

Table 3-43 provides a feasible scenario for WRCOG cities to achieve a regional efficiency-based emissions target for 2030. The table summarizes the measures analyzed for 2030 reductions, including the performance goals utilized and the resulting annual reductions for each measure. As indicated by this analysis, achieving these performance goals would enable the WRCOG region

to achieve the state-aligned 2030 target based on an efficiency metric of emissions per service population, as derived in **Table 3-38**.

Table 3-44 provides a scenario for WRCOG cities to achieve a regional absolute emissions target for 2030. As with **Table 3-43**, it summarizes the measures analyzed for 2030 reductions, including the performance goals utilized and the resulting annual reductions for each measure. The analysis indicates that achieving these performance goals would enable the WRCOG region to achieve the state-aligned 2030 target based on the absolute target derived in **Table 3-38**.

Table 3-43			
WRCOG Cities: GHG Reductions Needed from Local Measures to Achieve 2030 Target Based on Service Population Metric			
Local Measures by Sector		2030 Regional Performance Goal	2030 Reduction Potential (MTCO₂e/year)
Energy			
LE-1	Expand Local Renewable Energy Production	10% of total electricity demand generated by local solar PV systems	182,303
LE-2	Community Choice/Utility Renewable Electricity	75% of the population purchases 100% renewable electricity	246,109 ^a
LE-3	Improve Energy Efficiency of Existing Buildings	10% of existing buildings undertake measures to reduce energy use by 25%	79,374
LE-4	Building & Appliance Electrification	Reduce natural gas use in existing buildings by 15%	3,788
Transportation			
LT-10	Expand ZEV Infrastructure and Support ZEV Purchases	Increase ZEV adoption by 10% over California's statewide fleet mandates	231,028
Total Local Reductions Anticipated ^b			742,602
Total Local Reductions Needed (from Table 3-38)			735,676
Forecasted to Meet Target?			Yes
NOTE:			
a – Reductions from LE-1 (local solar PV) accounted for prior to quantification of LE-2 (i.e., avoids double counting).			
b – Totals may not add up due to rounding.			

Table 3-44			
WRCOG Cities: GHG Reductions Needed from Local Measures to Achieve 2030 Target Based on Absolute Emissions			
Local Measures by Sector		2030 Regional Performance Goal	2030 Reduction Potential (MTCO ₂ e/year)
Energy			
LE-1	Expand Local Renewable Energy Production	45% of total electricity demand generated by local solar PV systems	880,249
LE-2	Community Choice/Utility Renewable Electricity	95% of the population purchases 100% renewable electricity	372,875 ^a
LE-3	Improve Energy Efficiency of Existing Buildings	25% of existing buildings undertake measures to reduce energy use by 40%	316,737
LE-4	Building & Appliance Electrification	Reduce natural gas use in existing buildings by 30%	11,365
Transportation			
LT-10	Expand ZEV Infrastructure and Support ZEV Purchases	Increase ZEV adoption by 25% over California’s statewide fleet mandates	519,814
LT-1	Bicycle Infrastructure Improvements	Collectively, achieve 10% reduction in VMT through these measures	303,721
LT-2	Pedestrian Infrastructure Improvements		
LT-3	Carshare & Carpool Programs		
LT-4	Parking Pricing & Limited Requirements		
LT-5	Increase Transit Service & Frequency		
LT-7	Increase Housing Density		
LT-8	Increase Land Use Diversity		
LT-9	Transit-Oriented Development		
LT-11	Subsidized Transit		
LT-12	Congestion Pricing/Express Lanes		
Total Local Reductions Anticipated ^b			2,396,167

Table 3-44 WRCOG Cities: GHG Reductions Needed from Local Measures to Achieve 2030 Target Based on Absolute Emissions		
Local Measures by Sector	2030 Regional Performance Goal	2030 Reduction Potential (MTCO ₂ e/year)
Total Local Reductions Needed		2,352,538
Forecasted to Meet Target?		Yes
NOTE: a – Reductions from LE-1 (local solar PV) accounted for prior to quantification of LE-2 (i.e., avoids double counting). b – Totals may not add up due to rounding.		

2045 Subregional Assessment

As indicated in **Table 3-38**, achieving a 2045 target consistent with AB 1279 will require substantial reductions from local measures, and from transportation measures in particular. To achieve this target regionally, key strategies include a community-wide commitment to 100% renewable electricity (local measures LE-1 and LE-2) along with building energy efficiency upgrades (LE-3) and extensive electrification of buildings and transportation, consistent with the recommendation in CARB’s 2022 Climate Change Scoping Plan Update. In order to eliminate emissions from natural gas, implementing local measures LE-4 (Building and Appliance Electrification and LT-10 (Local ZEV Programs) will be particularly important for the WRCOG subregion to achieve a state-aligned 2045 target. Local governments must support the transition to zero emission vehicles (electric and hydrogen-powered vehicles), which already has momentum with rapidly developing technologies and changing consumer preferences along with a favorable state policy environment. Local governments can help speed this transition by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with their municipal fleets. Contributions will also be needed from measures that reduce VMT, such as RT-2 (Regional Transportation Demand Management), LT-9 (Transit-Oriented Development), and improved infrastructure for bicyclists (LT-1) and pedestrians (LT-2). Assessments are made individually for each city regarding a viable pathway for achieving a 2045 target that aligns with the State’s 2045 target.

City by City Assessment

As indicated in **Table 3-45**, all 18 cities in the WRCOG subregion have completed some form of climate action planning through their own local program or through participation in a WRCOG Subregional CAP, or both.⁸² This includes seven local jurisdictions that have either completed a local CAP, or they are currently in the process completing one. Locally developed CAPs are referenced where relevant 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 this CCAP, is included in Appendix B.

Local planning efforts are summarized in **Table 3-45**, including the emissions reduction expected by 2030 through implementation of these plans, and whether the plans demonstrate how a state-aligned GHG target for 2030 can be achieved.⁸³ As demonstrated by **Table 3-45**, seven WRCOG cities have demonstrated in their CAPs how a state-aligned 2030 target will be achieved, while

⁸² For the cities that don’t have a local CAP, all participated in the 2022 WRCOG Subregional CAP, except the City of Hemet, which participated in the original 2014 WRCOG Subregional CAP, but not the 2022 update.

⁸³ Note that the GHG reductions shown for the cities of Moreno Valley and Riverside are for the year 2040 and 2035, respectively, as the CAPs for those cities do not have a 2030 target and associated reduction calculations.

the remaining cities have CAPs that fall short of that target. For the longer-term target of 2045, the existing local plans generally do not quantify GHG reductions that far into the future, so a higher level qualitative assessment of each city's ability to achieve a state-aligned target for 2045 is provided in each of the following city sections.

Jurisdiction	Participated in 2022 Subregional CAP	Independently Developed, or In-Progress CAP	Planned 2030 Reductions (MTCO₂e)	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
Corona		*	159,096	49,045	Yes
Eastvale	*		77,887	117,248	No
Hemet ^a			NA	NA	Undetermined
Jurupa Valley	*		187,159	275,357	No
Lake Elsinore	*	*	146,367	136,204	Yes
Menifee	*		149,831	181,706	No
Moreno Valley ^b		*	411,743	298,669	Yes
Murrieta		*	279,463	278,338	Yes
Norco	*		73,078	109,913	No
Perris	*		147,808	206,400	No
Riverside ^c		*	1,674,191	2,120,931	No
San Jacinto	*		106,789	150,557	No
Temecula	*		241,352	322,455	No
Wildomar	*		60,929	91,334	No
WRCOG Cities CAP Total ^d			4,091,800	4,648,133	No
NOTES: a – Hemet participated in the 2014 WRCOG Subregional CAP, but that CAP did not set a 2030 target. b – Reductions for the Moreno Valley's CAP (2021) are for 2040 rather than 2030. c – Reductions for the Riverside's CAP (2016) are for 2035 rather than 2030. d – Totals may not add up due to rounding.					

City of Banning

As demonstrated in the 2022 WRCOG Subregional CAP, with the implementation of state, regional, and local measures, the City of Banning is expected to exceed its 2030 emissions target by more than 50,000 MTCO₂e. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

The commitment by Banning Electric Utility, the City's municipally owned utility, to provide 100 percent renewable power by the year 2030 (Measure LE-2) will likely be the City's most impactful measure for reducing GHG emissions over the next decade. Successful implementation of this measure will enable the City to achieve its 2030 emissions target and place the City on a path that aligns with the State of California's longer-term target for 2045. Maintaining that alignment will require future updates to the CAP, when the City will evaluate the success of existing measures and consider the changes or additional commitments that may be needed to further reduce the community's dependence on fossil fuels.

The two biggest sources of future emissions under Banning's plan are likely to be on-road transportation vehicles and natural gas used in buildings. Achieving the deeper reductions needed to align with the State's 2045 target will require maintaining the commitment to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the

CARB’s Climate Change Scoping Plan Update.⁸⁴ Implementing CCAP measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Beaumont

Beaumont participated in the 2022 WRCOG Subregional CAP, but the city also has a local CAP called Sustainable Beaumont, which 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 2030 target.

Although methods are not fully documented, the “adjusted BAU forecast”⁸⁵ 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. With the Advanced Clean Cars II rule, emissions from light duty vehicles should be even lower than what was anticipated in Sustainable Beaumont.

The 2022 Subregional CAP also demonstrates how Beaumont can exceed a state-aligned 2030 emissions target but indicates that additional action will be needed to keep the City on a path that aligns with the State of California’s longer-term target for 2045. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

As evidenced by the Subregional CAP, Beaumont’s two biggest sources of future emissions are likely to be on-road transportation vehicles and natural gas used in buildings, followed by electricity used in buildings. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. For example, the City of Beaumont could reduce electricity emissions by approximately 2,900 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier.

Achieving the deeper reductions needed to align with the State’s 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of

⁸⁴ CARB, 2022b

⁸⁵ The Adjusted BAU forecast in this context accounts for future growth under BAU conditions but also accounts for anticipated reductions from existing state mandates or regulations that are unaffected by local action.

buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

Table B-1 and B-2 in Appendix B of the CCAP lists each state and local measure in Sustainable Beaumont and identifies the corresponding measure, where relevant.⁸⁶

City of Calimesa

Although the City of Calimesa participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City will fall short by approximately 7,800 MTCO₂e, which represents about 20 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California’s longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by electricity used in buildings. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Calimesa could reduce electricity emissions by approximately 1,000 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier. The City’s 2030 target could be achieved if about 80% of the City’s electricity customers were purchasing a 100% Green option. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as the state of California continues to implement its ambitious plans for a clean energy future.

Achieving the deeper reductions needed to align with the State’s 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a

⁸⁶ SBCOG, 2024

favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Canyon Lake

The 2022 WRCOG Subregional CAP demonstrates how Canyon Lake can exceed a state-aligned 2030 emissions target but indicates that additional action will be needed to keep the City on a path that aligns with the State of California's longer-term target for 2045. By 2030, annual reductions of approximately 12,400 MTCO_{2e} can be achieved implementation of state, regional and local measures. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

The biggest sources of future emissions that must be addressed by the City are on-road transportation vehicles followed by residential and non-residential use of electricity. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Canyon Lake could reduce electricity emissions by approximately 840 MT CO_{2e} per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. The City's 2030 target could be achieved if all the City's electricity customers were purchasing a 100% Green option. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future.

Achieving the deeper reductions needed to align with the State's 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Corona

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 CAP indicates how the City plans to meet state-aligned GHG reduction targets

for the years 2030 and 2040, with a key strategy being the participation in a Community Choice Aggregation (CCA) program that can provide 100% renewable electricity to the City’s residents and businesses.

Achieving the deeper reductions needed to align with the State’s 2045 target will likely require maintaining the City of Corona’s commitment to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in CARB’s 2022 Climate Change Scoping Plan Update.⁸⁷ Implementing CCAP measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

Table B-3 in Appendix B of the CCAP lists each state and local measure in the City of Corona CAP Update, and identifies the corresponding CCAP measure, where relevant.⁸⁸

City of Eastvale

Although the City of Eastvale participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short of its 2030 target by approximately 39,000 MTCO₂e, which represents about 34 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California’s longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by residential and non-residential use of electricity. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Eastvale could reduce electricity emissions by approximately 3,750 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier. The City’s 2030 target would be nearly achieved if all of the City’s electricity customers purchased a 100% Green option. Over the next decade, City residents and businesses may have

⁸⁷ CARB, 2022b

⁸⁸ SBCOG, 2024

more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future.

Achieving the deeper reductions needed to align with the State’s 2045 target will require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Hemet

The City of Hemet was one of the twelve cities in Western Riverside County that joined efforts to develop WRCOG’s 2014 Subregional CAP. The City made specific commitments to reduce community GHG emissions across the energy, transportation, land use, and solid waste sectors, which helped enable WRCOG to demonstrate how the subregion could meet a 2020 target consistent with the State of California target for 2020, as mandated by AB 32. The City of Hemet did not participate in the 2022 WRCOG Subregional CAP, but since the City shares several characteristics with nearby cities such as San Jacinto, Perris, Menifee, and Moreno Valley – particularly in terms of climate and having a heavy percentage of residents commuting to work – it can be expected that the types of reduction measures and associated performance levels needed by the City to achieve state-aligned GHG reduction measures will be similar to those cities.

One good opportunity the City has for reducing emissions through 2030 is to encourage residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. Since more than 43 percent of the City’s GHG emissions (2010 community inventory) come from on-road vehicles, supporting the transition to electric vehicles is a key strategy for reducing emissions in both the near- and long-term. Nearly 30% of Hemet’s emissions in 2010 were associated with building electricity use, so the City could reduce those emissions substantially by getting the community’s electricity customers to participate in SCE’s 100% Green tier. And over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State’s 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification and LT-10

(Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Jurupa Valley

Although the City of Jurupa Valley participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 88,000 MTCO₂e, which represents about 32 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California's longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by residential and non-residential use of electricity. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Jurupa Valley could reduce electricity emissions by approximately 8,300 MT CO₂e per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. The City's 2030 target would be nearly achieved if all of the City's electricity customers purchased a 100% Green option. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State's 2045 target will require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the

municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Lake Elsinore

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.

The 2022 Subregional CAP also demonstrates how Beaumont can exceed a state-aligned 2030 emissions target, but indicates that additional action will be needed to keep the City on a path that aligns with the State of California's longer-term target for 2045. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Lake Elsinore also participated in the 2022 WRCOG Subregional CAP. As evidenced by the Subregional CAP, Beaumont's two biggest sources of future emissions are likely to be on-road transportation vehicles and natural gas used in buildings, followed by residential and non-residential uses of electricity. The best opportunity the City has for reducing emissions further in the short term is to encourage residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Lake Elsinore could reduce electricity emissions by approximately 4,400 MT CO₂e per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State's 2045 target will require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

Table B-4 in Appendix B of the CCAP lists each state and local measure in the Lake Elsinore CAP and identifies the corresponding CCAP measure, where relevant. The City is currently in the process of updating its Climate Action Plan, with adoption expected by 2026.⁸⁹

City of Meniffee

Although the City of Meniffee participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 31,900 MTCO₂e, which represents about 18 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California's longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by electricity used in buildings. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Meniffee could reduce electricity emissions by approximately 6,000 MT CO₂e per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. The City's 2030 target could be achieved if about half of the City's electricity customers purchased a 100% Green option. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State's 2045 target will require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

⁸⁹ SBCOG, 2024

City of Moreno Valley

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 advised that local communities should reduce emissions to no more than six MTCO₂e per capita per year by 2030 and no more than two MTCO₂e per capita by 2050 to be consistent with statewide targets. As such, the proposed targets for Moreno Valley are six MTCO₂e per capita per year by 2030 and four MTCO₂e 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.

Achieving the deeper reductions needed to align with the State’s 2045 target will require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

Table B-5 in Appendix B of the CCAP lists each state and local measure in the Draft Moreno Valley CAP and identifies the corresponding CCAP measure, where relevant.⁹⁰

City of Murrieta

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, and emissions forecasts for 2030, 2035, and 2050. GHG emission targets are established for the years 2030, 2035, and 2050, consistent with SB 32 and with Executive Order S-3-05 directing the state to achieve a reduction of 80 percent below 1990 levels by 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

⁹⁰ SBCOG, 2024

combination of state-level measures and local measures, which are described in detail in Chapter 3 of the CAP.

Achieving the deeper reductions needed to align with the State’s 2045 target will likely require community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in CARB’s 2022 Climate Change Scoping Plan Update. Implementing CCAP measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

Table B-6 in Appendix B of the CCAP lists each state and local measure in the City of Murrietta CAP and identifies the corresponding CCAP measure, where relevant.⁹¹

City of Norco

Although the City of Norco participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 36,800 MTCO₂e, which represents about 34 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California’s longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by non-residential and residential use of electricity. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Norco could reduce electricity emissions by approximately 2,800 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier. If all the City’s electricity customers were purchasing a 100% Green option, the City would only need another 8,500 MT CO₂e in annual reductions to achieve its 2030 reduction target. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To

⁹¹ SBCOG, 2024

complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State's 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Perris

Although the City of Perris participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 69,100 MTCO₂e, which represents about 28 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California's longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by non-residential and residential use of electricity. The best opportunity the City has for reducing emissions in the near term is to encourage residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in local measure LE-2. The City of Perris could reduce electricity emissions by approximately 4,900 MT CO₂e per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. If all of the City's electricity customers were purchasing a 100% Green option, the City would only need another 8,500 MT CO₂e in annual reductions to achieve its 2030 reduction target. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State's 2045 target will likely require a community-wide shift to 100% renewable electricity along with extensive electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan

Update. Implementing local measures LE-4 (Building and Appliance Electrification) and LT-10 (Local ZEV Programs) will be particularly important for the City to achieve a state-aligned 2045 target. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits (local measure LE-8). An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Riverside

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 committed the City to a 2020 GHG reduction target consistent with AB 32 and includes an aspirational target for 2035, established before the State of California mandated a 2030 target with passage of SB 32. The 2016 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 could 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.

Table B-7 and B-8 in Appendix B of the CCAP lists each state, regional, and local measure in the City of Riverside CAP and identifies the corresponding CCAP measure, where relevant.⁹² The City of Riverside CAP indicates how the City can meet its 2035 target through a mix of the following measures:

- Achieve 60% renewables in the utility (RPU) electricity mix by 2035
- Dedicate funding and staff resources for local energy efficiency programs
- Support low carbon vehicle/fuel infrastructure (e.g., publicly accessible EV charging stations)
- Incentive or require lower VMT associated with land use development
- Promote transit-oriented development, parking restrictions, and transportation management programs
- Enforce the state's increasingly stringent energy and green building standards
- Enhance water conservation

⁹² SBCOG, 2024

City of Riverside is currently in the process of updating its CAP to the planning horizon of 2050. As with other WRCOG cities, achieving the deeper reductions needed to align with the State's 2045 target will require electrification of buildings and transportation, as outlined in the CARB's 2022 Climate Change Scoping Plan Update. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. Along those lines, the City 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.

With respect to building electrification, 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.

With RPU, the City of Riverside is a leader in providing renewable energy to the community. 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.

City of San Jacinto

Although the City of San Jacinto participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 69,100 MTCO₂e, which represents about 29 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California's longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by residential and non-residential use of electricity.

In the near term, the City could reduce emissions from the electricity sector by encouraging residents and businesses to enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options), as described in Local Measure LE-2. The City of San Jacinto could reduce electricity emissions by approximately 3,100 MT CO₂e per year by getting just 10% of the community's electricity customers to participate in SCE's 100% Green tier. If all of the City's electricity customers were purchasing a 100% Green option, the City would only need another 12,600 MT CO₂e in annual reductions to achieve its 2030 reduction target. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future.

Achieving the deeper reductions needed to align with the State’s 2045 target will require electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits. An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Temecula

Although the City of San Jacinto participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 81,000 MTCO₂e, which represents about 25 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California’s longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by electricity used in buildings.

In the near term, the City could reduce emissions from the electricity sector by encouraging residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in Local Measure LE-2. The City of Temecula could reduce electricity emissions by approximately 8,000 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier. The City’s 2030 target would be nearly achieved if all the City’s electricity customers purchased a 100% Green option. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future. To complement a utility clean energy strategy, the City could promote residential and commercial installations of rooftop solar PV systems to expand local generation of renewable electricity.

Achieving the deeper reductions needed to align with the State’s 2050 goal will require extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update. The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead

of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits. An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

City of Wildomar

Although the City of San Jacinto participated in the 2022 WRCOG Subregional CAP, the local measures that the City has committed to implementing are not expected to reduce GHG emissions enough to reach a state-aligned 2030 emissions target. The 2022 Subregional CAP indicates that the City, with implementation of state, regional and local measures, will fall short by approximately 30,400 MTCO₂e, which represents about 33 percent of the total GHG emissions reductions needed to reach the 2030 target. See Appendix A of the WRCOG 2022 Subregional CAP for more details.

Additional actions will be needed by the City to meet the 2030 target and to keep the City on a path that aligns with the State of California’s longer-term target for 2045. The biggest sources of the future emissions that are not adequately addressed by the City in the 2022 Subregional CAP are on-road transportation vehicles and natural gas used in buildings, followed by residential and non-residential use of electricity.

In the near term, the City could reduce emissions from the electricity sector by encouraging residents and businesses to enroll in SCE’s Green Rate program (currently offering 50% and 100% renewable options), as described in Local Measure LE-2. The City of Wildomar could reduce electricity emissions by approximately 2,150 MT CO₂e per year by getting just 10% of the community’s electricity customers to participate in SCE’s 100% Green tier. If all of the City’s electricity customers were purchasing a 100% Green option, the City would only need another 8,900 MT CO₂e in annual reductions to achieve its 2030 reduction target. Over the next decade, City residents and businesses may have more options for purchasing renewable electricity as California continues to implement its ambitious plans for a clean energy future.

To close the gap for meeting the 2030 target, completing more energy efficiency retrofits of existing homes and commercial buildings (as described in Local Measure LE-3: Improve Energy Efficiency of Existing Buildings) would be effective in reducing natural gas emissions.

Achieving the deeper reductions needed to align with the State’s 2045 target will require extensive electrification of buildings and transportation, as outlined in the CARB’s 2022 Climate Change Scoping Plan Update.⁹³ The transition to zero emission vehicles (electric and hydrogen-powered vehicles) is gaining momentum with rapidly developing technologies, changing consumer preferences and a favorable policy environment. The City can help speed this transition locally by building community awareness of the benefits and practical advantages of owning ZEVs, supporting the installation of more EV chargers and hydrogen fueling stations, and leading by example with the municipal fleet. With respect to building electrification, the City can get ahead of future Title 24 updates with a local building code that incentivizes electrification or limits the use of fossil natural gas in new buildings and major retrofits. An awareness campaign promoting the health, safety, comfort, and cost savings benefits of building electrification could also be effective in supporting this transition.

⁹³ CARB, 2022a

Chapter 4

Co-benefits Analysis

This chapter provides a co-benefits analysis of the Climate Change Action Plan (CCAP). It identifies pollution-burdened communities using criteria developed by the California Office of Environmental Health Hazard Assessment (OEHHA) and highlights the various indicators that contribute to pollution burden and population vulnerability. The chapter also discusses the adverse impacts of climate change on these communities, including increased air pollution, extreme heat, flooding, drought, and wildfires. By understanding these vulnerabilities, the CCAP aims to implement measures that not only reduce greenhouse gas emissions but also provide significant social, economic, and environmental benefits to the affected populations.

California Priority Populations for Climate Investments

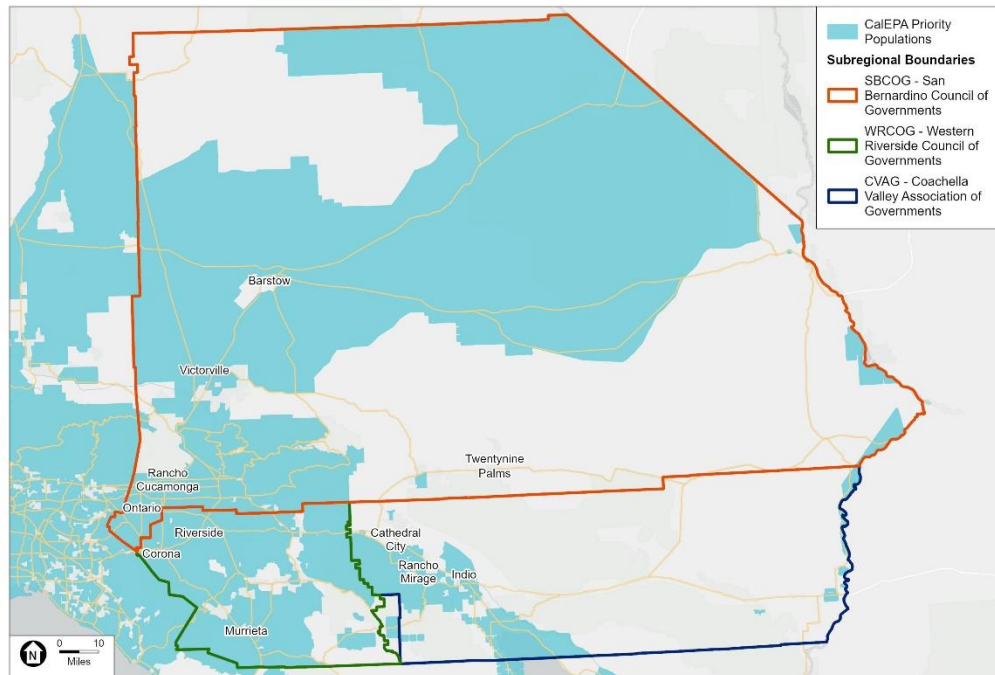
Per California’s Senate Bill 535 and Assembly Bill 1550, 35 percent of California Climate Investments must be allocated to pollution-burdened and low-income communities, collectively referred to as “priority populations.” These investments are designed to facilitate greenhouse gas emissions reductions while providing environmental, economic, and public health benefits. From affordable housing to clean transportation, urban greening to sustainable agriculture, waste diversion to technical assistance, and more, the diversity of program types reflects the many sector approaches needed to effectively reduce greenhouse gas emissions and provide benefits to Californians across the state.

The State of California defines priority populations for climate investments based on geographic, socio-economic, public health, and environmental hazard criteria (CCI, 2025). These are populations that live in areas exposed to multiple sources of pollution and which don’t have sufficient resources to invest in low-carbon practices, transportation, or climate resilience. The California Air Resources Board (CARB), in conjunction with the administering agencies, develops program-level targets to drive investments that achieve direct, meaningful, and assured benefits to priority populations (CARB, 2025). To support the co-benefits analysis, the CCAP identifies priority populations using criteria developed by the State of California, including the California Environmental Protection Agency (CalEPA) and California Office of Environmental Health Hazard Assessment (OEHHA). Priority populations include census tracts experiencing disproportionate amounts of pollution, environmental degradation, and socioeconomic and public health conditions (as determined by OEHHA’s CalEnviroScreen 4.0 tool), and those that are considered low-income (at or below 80 percent of the statewide median or below a threshold designated as low-income by the California Department of Housing and Community Development). CARB provides a mapping tool for identifying priority populations, called the California Climate Investments Priority Populations Mapping Tool 4.0 (CCI, 2024)

Figure 4-1 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 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.⁹⁴

Figure 4-1 CalEPA Priority Populations in Riverside–San Bernardino–Ontario MSA



SOURCE: CCI, 2024; ESA, 2025

Vulnerability Assessment

The following section presents a vulnerability assessment to describe the increased risk faced by priority populations 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

⁹⁴ US Census Bureau, 2020

Sea, typically experience high levels of ozone and particle pollution, and may experience worsening conditions due to increasing airborne dust.⁹⁵

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.⁹⁶

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.⁹⁷ 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 and exceed state and/or federal ozone standards.⁹⁸ 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 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.^{99,100}

However, WRCOG's Resilient IE describes projections for both San Bernardino and Riverside counties.¹⁰¹ 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 2050.¹⁰²

⁹⁵ Hopkins, 2018

⁹⁶ CNRA, 2018

⁹⁷ OEHHA, 2021

⁹⁸ SCAQMD, 2022

⁹⁹ Includes western Riverside County and southwestern corner of San Bernardino County that are not within SCAQMD.

¹⁰⁰ CARB, 2022c

¹⁰¹ WRCOG, 2020

¹⁰² 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 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 2.5.¹⁰³

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 2.5.¹⁰⁴ The SCAQMD region that includes the non-desert areas of Riverside County and San Bernardino County is in nonattainment for both AAQS and NAAQS.¹⁰⁵

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.¹⁰⁶

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.

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

¹⁰³ OEHHA, 2021

¹⁰⁴ CARB, 2022c

¹⁰⁵ Includes western Riverside County and southwestern corner of San Bernardino County that are not within SCAQMD.

¹⁰⁶ OEHHA, 2021

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 1961–1990.¹⁰⁷ 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.¹⁰⁸ 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.¹⁰⁹ There were over 10,000 heat-related deaths recorded in the U.S. from 2004 to 2018.¹¹⁰ In 2006, a prolonged heat wave in California killed over 140 people and resulted in nearly 1,200 hospitalizations and more than 16,000 emergency department visits.¹¹¹

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.¹¹² 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.

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

¹⁰⁷ Cal-Adapt, 2018

¹⁰⁸ Cal-Adapt, 2018

¹⁰⁹ Bedsworth et al., 2018

¹¹⁰ USEPA, 2022

¹¹¹ Knowlten et al, 2008

¹¹² WRCOG, 2020

rely heavily on transportation infrastructure.¹¹³ 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.¹¹⁴ 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.¹¹⁵ The mountain regions of the Inland Empire in particular are expected to see increases in wildfire events by mid-century.

¹¹³ WRCOG, 2020

¹¹⁴ NOAA, 2018

¹¹⁵ WRCOG, 2020

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 populations that are already burdened by pollution or have low incomes. Poor air quality is especially harmful to 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 CCAP Measures

Identifying populations burdened by pollution and understanding their climate change vulnerabilities allows for targeted planning to ensure adopted measures are tailored to address specific challenges. Many of the measures identified in this CCAP provide additional social, economic, or environmental advantages to these populations 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 CCAP 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 CCAP are described below.

Air Pollution

The CCAP includes GHG reduction measures that will result in enhanced air quality for the region. As outlined in the Vulnerability Assessment, San Bernardino and Riverside counties face a high air pollution burden compared to national averages. Priority populations 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 vulnerable populations. 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. Priority populations are often faced with increased exposure to hazardous pollution resulting from such incidents. GHG reduction measures that facilitate the transition from fossil fuels to renewable energy sources can help alleviate these pollution 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 priority populations, 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. Priority populations in particular can benefit from these measures as they are often disproportionately 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 priority populations 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 priority populations 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 communities are particularly vulnerable.

Community Resilience

Measures that promote community resilience can be particularly beneficial to priority populations, which typically have a lower capacity to adapt to climate change hazards. With fewer resources, priority populations 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 for these populations.

GHG Reduction Measure Co-Benefits Analysis

The GHG reduction measures in this plan will bring both direct and indirect co-benefits to communities throughout the Inland Empire. The three regional measures in the CCAP are assessed individually, while the CCAP’s extensive local measures, as outlined in Section 6 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 an overarching strategy are expected to yield similar co-benefits. In some cases, an individual measure has been grouped with more than one strategy.

Table 4-1 summarizes the anticipated co-benefits associated with each regional measure and with each grouping of local measures included in the CCAP that have similar characteristics in terms of how they provide co-benefits. These co-benefits are discussed in the following section. The table also identifies the Air Quality Co-benefits Category that represents each measure or measure grouping, which is used in the co-pollutants analysis at the end of the chapter.

Table 4-1
Summary of Anticipated Co-Benefits

	Air Quality Co-benefits Category	Air Pollution	Other Pollution	Public Health	Resource Conservation	Economic Development	Community Awareness & Capacity Building	Parks and Urban Greening	Community Resilience
Regional GHG Reduction Measures									
EV Infrastructure	Vehicle Electrification	X	X	X		X	X		X
Decarbonize Existing Buildings	Building & Appliance Electrification	X	X	X	X	X			X
Goods Movement	Vehicle Electrification	X	X	X					X
Local GHG Reduction Measures									
Building and Appliance Electrification	Building Electrification	X	X	X	X	X			X
Energy Efficiency and Resilience	Energy Efficiency	X	X	X	X		X		X
Green Building and Urban Design	Energy Efficiency	X	X	X	X		X	X	X
Shift to Renewable Energy	Renewable Energy	X	X	X	X	X	X		X
Reduce VMT through Land Use Changes	VMT Reduction	X	X	X			X	X	X
Clean Vehicles and Reduced Tailpipe Emissions	Vehicle Electrification	X	X	X		X			
Mode Shift	VMT Reduction	X	X	x		X	X		X
Expand and Improve Transit	VMT Reduction	X	X	X			X		

Table 4-1
Summary of Anticipated Co-Benefits

	Air Quality Co-benefits Category	Air Pollution	Other Pollution	Public Health	Resource Conservation	Economic Development	Community Awareness & Capacity Building	Parks and Urban Greening	Community Resilience
Materials Recycling and Waste Reduction	NA	X	X	X	X	X	X		X
Water Conservation	Energy Efficiency			X	X				X
Expand Community Resilience	NA			X			X		X
Promote Sustainable Business Practices	NA			X		X			X
Expand Carbon Sequestration	NA	X		X				X	X
Local Agriculture	NA	X		X	X				X
NOTES: NA – Not assessed by the CCAP for air quality benefits.									

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 can accrue from 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 priority populations 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

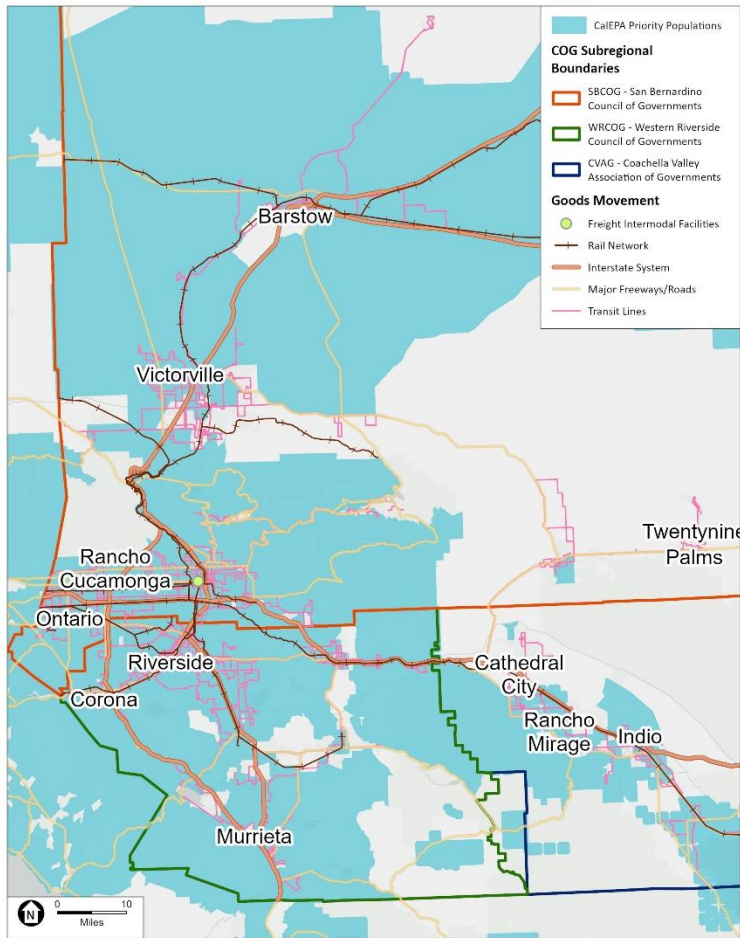
Goods movement is a significant and key marker of Southern California's economy. However, goods movement corridors often traverse dense urban communities, affecting local and regional air quality and posing significant exposure and risk to public health. A map of priority populations in relation to goods movement infrastructure in western Riverside-San Bernardino-Ontario MSA is shown in **Figure 4-2**. 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. 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 can lead to several health and economic co-benefits. The adoption of electric appliances and systems can lead to significant energy cost savings for residents. 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 4-2 CalEPA Priority Populations and Goods Movement in Riverside-San Bernardino-Ontario MSA



SOURCE: Caltrans, 2024; CCI, 2024; ESA, 2025

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 priority populations. 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 4-2** identifies local measures that WRCOG, CVAG, and SBCOG have adopted to support building and appliance electrification.

Table 4-2 Building and Appliance Electrification Measures	
WRCOG Measures	
WRCOG LE-4	Building and Appliance Electrification
WRCOG LE-8	Reach Codes for New Buildings - Going Beyond Title 24
CVAG Measures	
CVAG Energy-1	Building Electrification
CVAG Energy-4	Appliance Electrification Upgrades
SBCOG Measures	
SBCOG MO-31,32,33	Upgrade Existing Home Appliances

Table 4-2
Building and Appliance Electrification Measures

Regional: SBCOG Energy-3	Building Electrification

Energy Efficiency

The implementation of energy efficiency measures can result in a variety of co-benefits by way of reducing financial burdens associated with energy costs, improving quality of life in urban and climate-impacted areas, and promoting more widespread 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 priority populations 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 for low-income populations and incentivizing home energy assessments directly engages residents 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 all.

Additionally, larger infrastructure projects like the Sanitary District WRP Energy Efficiency Project and the Coachella Valley 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 4-3** identifies local measures that WRCOG, CVAG, and SBCOG have adopted to improve energy efficiency and resilience.

Table 4-3
Energy Efficiency Measures

WRCOG Measures	
WRCOG LE-3	Improve Energy Efficiency of Existing Buildings
WRCOG LE-5	Traffic & Street Light Upgrades
County of Riverside Measure 1.1	Energy Efficiency Training, Education, and Recognition in the Residential Sector
County of Riverside Measure 1.2	Increase Community Participation in Existing Energy Efficiency Programs
County of Riverside Measure 1.3	Home Energy Evaluations
County of Riverside Measure 1.4	Residential Home Energy Renovations
County of Riverside Measure 2.1	Exceed Energy Efficiency Standards
County of Riverside Measure 3.1	Energy Efficiency Training, Education, and Recognition in Commercial Sector
County of Riverside Measure 3.2	Increase Business Participation in Existing Energy Efficiency Programs
County of Riverside Measure 3.3	Non-Residential Building Energy Audits
County of Riverside Measure 3.4	Non-Residential Building Retrofits

Table 4-3
Energy Efficiency Measures

County of Riverside Measure 4.1	Exceed Energy Efficiency Standards
County of Riverside Measure 6.2	Light-Reflecting Surfaces for Energy Saving
CVAG Measures	
CVAG Energy-2	LED Bulbs and Fixtures
CVAG Energy-3	Smart Thermostat
CVAG Energy-7	Roofline Insulation and Attic Encapsulation
CVAG Energy-8	HVAC Maintenance Program
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 priority populations 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 priority populations, as they often reside in areas with limited green spaces.

Moreover, the emphasis on green building practices can help ensure that housing in priority populations 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 priority populations will result in cooler, more energy-efficient, affordable, and environmentally friendly neighborhoods. **Table 4-4** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support green building and urban design.

Table 4-4
Green Building and Urban Design Measures

WRCOG Measures	
WRCOG LE-6	Shade Trees
WRCOG LE-7	Cool Roofs and Pavements
County of Riverside Measure 6.1	Tree Planting for Shading and Energy Saving
County of Riverside Measure 6.2	Light-Reflecting Surfaces for Energy Saving
CVAG Measures	
CVAG Energy-5	Solar Window Film
CVAG Energy-6	Cool Roofs
CVAG Agriculture-1	Urban Tree Planting
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 priority population. 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 priority population 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 priority populations, contributing to economic development.

The promotion of Net Zero Buildings and the inclusion of electric charging infrastructure in renewable energy master plans ensure that priority populations 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 priority populations with cleaner and more affordable energy sources.

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 residents throughout the region. **Table 4-5** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support the shift to renewable energy.

Table 4-5 Renewable Energy Measures	
WRCOG Measures	
WRCOG LE-1	Expand Local Renewable Energy Production
WRCOG LE-2	Community Choice Energy/Green Grid Offerings
County of Riverside Measure 9.1	Promote Clean Energy
County of Riverside Measure 9.2	Join Community Choice Aggregation Program
CVAG Measures	
CVAG Energy-9	Solar Installations for New Commercial and Industrial Development
CVAG Energy-10	On-site Solar Energy for New and Existing Warehouse Space
CVAG Energy-11	Solar Installations for Existing Homes
CVAG Energy-12	Solar Installations for Existing Commercial and Industrial Buildings
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 priority populations.

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 priority populations. 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 priority populations, offer co-benefits that include increased access to affordable housing, improved transportation options, economic development, reduced urban sprawl, and enhanced environmental quality. **Table 4-6** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to reduce VMT through land use changes.

Table 4-6	
VMT Reduction Measures	
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
WRCOG: RT-1 (Regional)	Metrolink Expansion
CVAG Measures	
CVAG On-Road-1	Increase Housing Density
CVAG On-Road-2	Increase Land Use Diversity
CVAG On-Road-8	Transit Oriented Development
SBCOG Measures	
SBCOG	Parking Policy and Event Parking
SBCOG 8	Smart Growth and Infill - mix-use development

Clean Vehicles and Fuel Switching

Policy measures related to clean vehicles and reduced tailpipe emissions (fuel switching measures) can result in co-benefits for priority populations 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 priority populations 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 priority populations in the form of improved air quality.

These initiatives can be coupled with efforts to make ZEVs more accessible to priority populations that may not have access to electric vehicle charging at home. Mobility for priority populations 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 4-7** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support clean vehicles and reduce tailpipe emissions.

Table 4-7	
Clean Vehicles and Fuel Switching Measures	
WRCOG Measures	
WRCOG LT-6	Traffic Signal Coordination and Calming Measures
WRCOG LT-10	Expanded ZEV Infrastructure and ZEV Purchases
WRCOG: RT-3 (Regional)	Goods Movement Decarbonization
County of Riverside Measure 7.4	Electrify the Fleet
CVAG Measures	
CVAG On-Road-3	Light-Duty Electric Vehicle Infrastructure
CVAG On-Road-6	Transition City and Agency Fleets to Zero Emission Vehicles
CVAG Off-Road-1	Construction Equipment Electrification
CVAG Off-Road-1	Lawn and Garden Equipment Electrification
SBCOG Measures	
SBCOG G-2, G-3	Install Community Charging Stations
Regional: SBCOG On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric
Regional: SBCOG Transportation-5	Community Fleet Electrification
Regional: SBCOG Off-Road-1	Electric-Powered Construction Equipment
Regional: SBCOG Off-Road-2	Idling Ordinance
Regional: SBCOG Off-Road-3	Electric Landscaping Equipment

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 priority populations that result from improved local environmental conditions.

Enhanced bicycle transportation systems offer priority population 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 priority populations.

Carshare and carpool programs, coupled with Transportation Demand Management strategies, provide priority populations 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 priority populations.

Overall, Mode Shift measures offer co-benefits that include enhanced access to affordable and sustainable transportation options, improved safety, reduced transportation costs, and healthier living environments for priority populations. **Table 4-8** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support mode shift.

**Table 4-8
Mode Shift**

WRCOG Measures	
WRCOG LT-1	Bicycle Infrastructure Improvements
WRCOG LT-2	Pedestrian Infrastructure Improvements
WRCOG LT-3	Carshare & Carpool Programs
WRCOG: RT-2 (Regional)	Transportation Demand Management
County of Riverside Measure 7.1	Alternative Transportation Options
County of Riverside Measure 7.2	Adopt & Implement Bicycle Master Plan to Expand Bike Routes around the County
County of Riverside Measure 7.3	Ride-Sharing and Bike-to-Work Programs within Businesses
CVAG Measures	
CVAG On-Road-4	Pedestrian Infrastructure Improvements
CVAG On-Road-5	Bicycle and Micromobility Infrastructure Improvements
CVAG On-Road-9	Transportation Demand Management
CVAG On-Road-10	Parking Pricing and Limited Requirements
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 accessible urban mobility landscape through targeted measures benefits priority populations when done in a way that addresses their specific transportation needs. These measures can also contribute to improved environmental conditions for community members. Increasing transit service frequency and subsidizing transit costs can significantly enhance transportation affordability and mobility resources for priority population 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 priority populations, offering flexible, cost-effective, and efficient transportation alternatives. By promoting mass transit and implementing smart bus technologies, priority populations benefit from improved travel times and transit reliability, which support a high quality of life and economic opportunities. **Table 4-9** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to expand and improve transit services.

**Table 4-9
Expand and Improve Transit**

WRCOG Measures	
WRCOG LT-5	Increase Transit Service/Frequency
WRCOG LT-11	Subsidized Transit
WRCOG LT-12	Congestion Pricing/Express Lanes
CVAG Measures	
CVAG On-Road-7	Increase Transit Service and Frequency
CVAG On-Road-11	Traffic Signal Coordination
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 priority populations. 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 priority populations 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 priority populations. 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 priority populations. **Table 4-10** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to support materials recycling and reduce waste.

Table 4-10 Materials Recycling and Waste Reduction	
WRCOG Measures	
WRCOG LR-1	Zero Waste Initiatives (exceed state mandates)
County of Riverside Measure 8.1	Reduce Waste to Landfills
CVAG Measures	
CVAG Waste-1	Construction and Demolition Waste Diversion
CVAG Waste-2	Solid Waste Diversion
CVAG Waste-3	Food Waste and Organics Diversion
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 4-11** identifies local strategies that WRCOG, CVAG, and SBCOG have adopted to conserve water.

Table 4-11 Water Conservation	
WRCOG Measures	
WRCOG LW-1	Increase Recycled Water Use
County of Riverside Measure 5.1	Water Efficiency through Enhanced Implementation of SB X7-7
County of Riverside Measure 5.2	Exceed Water Efficiency Standards
CVAG Measures	
CVAG Water-1	Increase Recycled Water Use
CVAG Water-2	Water Conservation

Table 4-11
Water Conservation

CVAG Wastewater-1	Water and Wastewater
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 priority populations 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 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 priority populations. 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 4-12** identifies local strategies that SBCOG has adopted to increase community resilience.

Table 4-12
Expand Community Resilience

SBCOG Measures	
SBCOG 26	Climate Change Awareness and Education

Promote Sustainable Business Practices

Promoting sustainable business practices can yield benefits for low income and pollution burdened 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 priority populations. 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 4-13** identifies local strategies that SBCOG has adopted to promote sustainable business practices.

Table 4-13
Promote Sustainable Business Practices

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 priority populations 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 priority populations, offering employment in the planting, maintenance, and care of these green spaces. **Table 4-14** identifies local strategies that WRCOG and SBCOG have adopted to expand carbon sequestration.

Table 4-14
Expand Carbon Sequestration

WRCOG Measures	
WRCOG LE-6	Shade Trees
CVAG Measures	
CVAG Agriculture-1	Urban Tree Planting
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 priority populations by supporting local farms, community gardens, and sustainable food production.

For priority populations, 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 can lead to the creation of local jobs, enhancing economic 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 priority populations. **Table 4-15** identifies local strategies that WRCOG and CVAG have adopted to support local agriculture.

Table 4-15
Local Agriculture

WRCOG Measures	
WRCOG LA-1	Local Agriculture/Community Gardens
CVAG Measures	
CVAG Agriculture-2	Local Agriculture and Community Gardens

Co-pollutant Analysis

Reduction measures are grouped into one of five different co-pollutant quantification categories as identified in **Table 4-16**. The emission factors and example calculations for each quantification category are listed in the subsections below.

Building Electrification

As stated above, the electrification of buildings and appliances can lead to better air quality and health outcomes. Specifically, electrification would limit the end-use combustion of natural gas leading to reductions in key criteria air pollutants, namely nitrous oxides (NO_x), sulfur oxides (SO_x), particulate matter (PM), and volatile organic compounds (VOCs), and carbon monoxide (CO). **Table 4-16** provides the relevant emission factors that can be utilized to estimate the avoided air pollutants as a result of electrification of buildings.

Table 4-16
Air Pollutant Emission Factors for Electrification Measures

Avoided Air Pollutants from Electrification ^a						
Land Use Type	Units	NO_x	SO_x	PM2.5	VOC	CO
Residential	lbs/MMBtu	0.0922	0.0006	0.0075	0.0054	0.0392
Commercial/Industrial	lbs/MMBtu	0.0980	0.0006	0.0075	0.0054	0.0824
NOTES: a – Natural gas combustion emission factors are derived from EPA’s AP-42: Compilation of Air Emissions Factors from Stationary Sources. Available: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources						

For example, using these emissions factors, a building electrification measure that reduces residential natural gas use by 1,000 MMBtu would result in an estimated reduction of 92 lbs of NO_x, 0.6 lbs of SO_x, 7.5 lbs of PM2.5, and 5.4 lbs of VOCs.¹¹⁶

Energy Efficiency

Like electrification, energy efficiency of buildings can lead to better air quality and health outcomes. Specifically, energy efficiency reduces the upstream combustion of natural gas and the generation of electricity leading to reductions in key criteria air pollutants, namely nitrous oxides (NO_x), sulfur oxides (SO_x), particulate matter (PM), volatile organic compounds (VOCs), and carbon monoxide (CO). **Table 4-17** provides the relevant emission factors that can be utilized to estimate the avoided air pollutants that result from improving the energy efficiency of buildings.

Table 4-17
Air Pollutant Emission Factors for Electrification Measures

Land Use Type	Avoided Air Pollutants from Energy Efficiency						
	Fuel Type ^{a,b}	Units	NO_x	SO_x	PM2.5	VOC	CO
Residential	Natural Gas	lbs/MMBtu	0.0922	0.0006	0.0075	0.0054	0.0392
Commercial/Industrial	Natural Gas	lbs/MMBtu	0.0980	0.0006	0.0075	0.0054	0.0824
Residential	Electricity	lbs/MWh	0.17	0.03	0.04	0.02	N/A
Commercial/Industrial	Electricity	lbs/MWh	0.17	0.03	0.04	0.02	N/A

¹¹⁶ 1,000 MMBtu x Air pollutant emission factor (lbs/MMBtu) = Avoided air pollutant emissions (lbs)

Table 4-17
Air Pollutant Emission Factors for Electrification Measures

Land Use Type	Avoided Air Pollutants from Energy Efficiency						
	Fuel Type ^{a,b}	Units	NO _x	SO _x	PM2.5	VOC	CO
NOTES: a – Natural gas combustion emission factors are derived from EPA’s AP-42: Compilation of Air Emissions Factors from Stationary Sources. Available: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources b – Electricity emission factors are derived from EPA’s Avoided Emissions and generation (AVERT) Tool. Available: https://www.epa.gov/avert							

For example, using these emissions factors, an energy efficiency measure that reduces commercial natural gas use by 500 MMBtu and commercial electricity by 625 MWh would result in a reduction of 153.2 lbs of NO_x, 18.9 lbs of SO_x, 31.7 lbs of PM2.5, and 12.9 lbs of VOCs.¹¹⁷

Renewable Energy

Renewable energy can lead to better air quality and public health. Specifically, use of renewable eliminates the combustion of fossil fuels such as coal, oil, and natural gas. This results in a reduction of key criteria air pollutants, namely nitrous oxides (NO_x), sulfur oxides (SO_x), particulate matter (PM), volatile organic compounds (VOCs), and carbon monoxide (CO). **Table 4-18** provides the relevant emission factors that can be utilized to estimate the avoided air pollutants as a result of renewable energy adoption.

Table 4-18
Air Pollutant Emission Factors for Renewable Energy Measures

Measure Category	Avoided Air Pollutants from Energy Efficiency					
	Units	NO _x	SO _x	PM2.5	VOC	CO
Distributed Solar ^{a,b}	lbs/MWh	0.030	0.004	0.008	0.003	N/A
Community Choice Aggregation ^c	lbs/MWh	0.392	0.020	0.028	0.019	N/A
NOTES: a – Electricity emission factors are derived from EPA’s AVERT Tool. Available: https://www.epa.gov/avert b – Location-specific electricity generation resulting from installed solar capacity can be estimated by using NREL’s PVWatts Calculator. Available: https://pvwatts.nrel.gov/pvwatts.php c – Electricity emission factors for switching to a CCA are derived from EPA’s eGRID Tool and represents the Statewide grid average emission rates for the power mix in 2021 (latest year available).						

For example, using these emissions factors, a rooftop solar measure that includes the installation of 5 MW of solar capacity in the community in Riverside, California would generate 8,515 MWh of electricity which would result in the avoidance of 256.1 lbs of NO_x, 35.6 lbs of SO_x, 70.2 lbs of PM2.5, and 26.2 lbs of VOCs.¹¹⁸

VMT Reduction

Reducing vehicle miles traveled (VMT) improves air quality by decreasing tailpipe emissions of harmful pollutants such as nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOCs), which contribute to ground-level ozone and smog formation. Fewer miles driven means less fuel burned in engines powered by fossil fuels, particularly gasoline and diesel, which are major sources of these criteria pollutants. This results in cleaner air, particularly in urban areas with heavy traffic, and leads to public health benefits such as reduced respiratory illnesses, asthma attacks, and premature deaths associated with poor

¹¹⁷ 500 MMBtu x air pollutant emission factor (lbs/MMBtu) = Avoided air pollutant emissions from natural gas (lbs)
625 MWh x air pollutant emission factor (lbs/MWh) = Avoided air pollutant emissions from electricity (lbs)
Avoided air pollutant emissions from natural gas (lbs) + Avoided air pollutant emissions from electricity (lbs) =
Total avoided air pollutants (lbs).

¹¹⁸ 5 MW of solar capacity x 1.703 MWh/MW of capacity (PVWatts solar production rate for Riverside, CA) = 8,515 MWh
8,515 MWh x air pollutant emission factor (lbs/MWh) = Avoided air pollutant emissions from renewable electricity (lbs)

air quality. **Table 4-19** provides the relevant emission factors that can be utilized to estimate the avoided air pollutants as a result of VMT reduction.

Table 4-19 Air Pollutant Emission Factors for VMT Reductions ^a					
Vehicle Type ^b	Avoided Air Pollutants from VMT Reductions(g/mile)				
	NO _x	SO _x	PM2.5	VOC	CO
Passenger	0.057	0.003	0.005	0.111	0.878
Truck	1.687	0.012	0.058	0.073	0.809
Bus	0.984	0.007	0.031	0.121	14.30
NOTES a – Vehicle emission factors are derived from CARB’s EMFAC2021 model and are specific to the MSA. Emissions factors are calculated for year 2030 and are a weighted average of all fuel types. EMFAC2021 available: https://arb.ca.gov/emfac/emissions-inventory/45fa18544df1284f533a4c608498ccca09329ce7 b – EMFAC2021 vehicle categories were organized into three vehicle types: passenger, truck, and bus. Passenger vehicles include the following EMFAC vehicle categories: LDA, LDT1, LDT2, MCY, and MDV). Trucks include the following EMFAC vehicle categories: LHD1, LHD2, T6 CAIRP Class 4-7, T6 Delivery, T6 Instate, T6 OOS Class 4-7, T6 Public Class 4-7, T6TS, T7 (all) Class 8, T7IS. Busses include the following EMFAC vehicle categories: OBUS, SBUS, PTO, UBUS, All Other Buses.					

For example, using these emissions factors, a measure that reduces 1,500,000 passenger VMT per year would result in the avoidance of 188.5 lbs of NO_x, 9.9 lbs of SO_x, 16.5 lbs of PM2.5, 367.1 lbs of VOCs, and 2,903.5 lbs of CO.¹¹⁹

Vehicle Electrification

Vehicle electrification refers to the replacement of fossil fuel-powered vehicles with electric-powered or other cleaner fuel-powered (e.g. hydrogen) alternatives. Switching from fossil fuel-powered vehicles to zero emission vehicles (ZEVs) improves air quality by eliminating tailpipe emissions of pollutants such as nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), and volatile organic compounds (VOCs), which are major contributors to smog and poor air quality. Since ZEVs produce no direct emissions during operation, they significantly reduce localized air pollution, especially in high-traffic areas. **Table 4-20** includes the relevant on road emission factors that can be utilized to estimate the avoided air pollutants as a result of vehicle electrification.

Table 4-20 Air Pollutant Emission Factors for Fuel Switching ^a						
Vehicle Type ^b	Fuel Type	Emission Factor (g/mile)				
		NO _x	SO _x	PM2.5	VOC	CO
Passenger ^c	Gasoline	0.0652	0.0028	0.0047	0.1247	0.9963
	Diesel	0.0002	0.0000	0.0000	0.0000	0.0005
	Electricity	0.0000	0.0000	0.0002	0.0000	0.0000
Trucks	Gasoline	0.0284	0.0007	0.0028	0.0226	0.2049
	Diesel	1.6557	0.0111	0.0545	0.0499	0.5795
	Electric	0.0000	0.0000	0.0009	0.0000	0.0000
	Natural Gas	0.0026	0.0000	0.0002	0.0001	0.0244
Bus	Gasoline	0.1075	0.0041	0.0063	0.0858	0.6199
	Diesel	0.7392	0.0026	0.0065	0.0130	0.0634
	Electric	0.0000	0.0000	0.0008	0.0000	0.0000
	Natural Gas	0.1375	0.0000	0.0178	0.0221	13.6168
NOTES: a – Vehicle emission factors are derived from CARB’s EMFAC2021 model and are specific to the MSA. Emissions factors are calculated for year 2030 and are a weighted average of all EMFAC vehicle categories per fuel type associated with either passenger vehicles, trucks, or buses. EMFAC2021 available: https://arb.ca.gov/emfac/emissions-inventory/45fa18544df1284f533a4c608498ccca09329ce7 b – EMFAC2021 vehicle categories were organized into three vehicle types: passenger, truck, and bus. Passenger vehicles include the following EMFAC vehicle categories: LDA, LDT1, LDT2, MCY, and MDV). Trucks include the following EMFAC vehicle categories:						

¹¹⁹ 1,500,000 passenger VMT x air pollutant emission factor (g/mile) ÷ 453.592 g/lb = Avoided air pollutant emissions (lbs/yr)

Table 4-20
Air Pollutant Emission Factors for Fuel Switching ^a

Vehicle Type ^b	Fuel Type	Emission Factor (g/mile)				
		NOx	SOx	PM2.5	VOC	CO
LHD1, LHD2, T6 CAIRP Class 4-7,T6 Delivery, T6 Instate, T6 OOS Class 4-7, T6 Public Class 4-7, T6TS, T7 (all) Class 8, T7IS. Busses include the following EMFAC vehicle categories: OBUS, SBUS, PTO, UBUS, All Other Buses.						
c – EMFAC2021 assumes that a negligible number of passenger vehicles are natural gas-powered in year 2030, therefore natural gas emission factors are not presented for passenger vehicles.						

For example, using the emissions factors for PM_{2.5}, if a measure were to convert 200,000 VMT from gasoline-powered passenger vehicles to electric-powered vehicles, the result would be 2 lbs of avoided PM_{2.5} emissions.¹²⁰

Table 4-21 includes the relevant emission factors that can be utilized to estimate the avoided air pollutants as a result of off-road vehicle electrification.

Table 4-21
Air Pollutant Emission Factors for Off-Road Vehicle Electrification ^a

Vehicle Type ^b	Horsepower	Tier	Emission Factor (g/bhp-hr)		
			NO _x	VOC	PM ₁₀
Construction Equipment	25-49	1	5.26	1.32	0.48
	25-49	2	4.63	0.22	0.28
	25-49	Tier 4 (Interim)	4.55	0.09	0.128
	25-49	Tier 4 (Final)	2.75	0.09	0.009
	50-74	1	6.54	0.9	0.552
	50-74	2	4.75	0.17	0.192
	50-74	3	2.74	0.09	0.192
	50-74	Tier 4 (Interim)	2.74	0.09	0.112
	50-74	Tier 4 (Final)	2.74	0.09	0.009
	75-99	1	6.54	0.9	0.552
	75-99	2	4.75	0.17	0.192
	75-99	3	2.74	0.09	0.112
	75-99	4 (Phase-In)	2.15	0.08	0.009
	75-99	4 (Final)	0.26	0.05	0.009
Lawn mowers (residential)	All	N/A	2.436	N/A	0.017
Ride-on Mowers (residential)	All	N/A	1.515	N/A	0.010
Chainsaws (residential)	All	N/A	1.456	N/A	0.610
Leafblowers (residential)	All	N/A	0.717	N/A	0.589
Trimmers/Edgers (residential)	All	N/A	1.378	N/A	0.314
Lawn mowers (commercial)	All	N/A	3.909	N/A	0.017
Standing Ride Mowers (commercial)	All	N/A	3.909	N/A	0.017
Ride-on Mowers (commercial)	All	N/A	2.840	N/A	0.010
Chainsaws (commercial)	All	N/A	44.552	N/A	0.610
Leafblowers (commercial)	All	N/A	29.078	N/A	0.589
Trimmers/Edgers (commercial)	All	N/A	27.071	N/A	0.314
NOTES:					
a – Vehicle emission factors are derived from CARB’s California Climate Investments Quantification Methodology Emission Factor Database. Available: https://ww2.arb.ca.gov/resources/documents/california-climate-investments-quantification-benefits-and-reporting-materials					
b – Construction equipment is assumed to be diesel-powered and all lawn and garden equipment is assumed to be gasoline-powered.					

The emission factors listed in **Table 4-21** can be used to calculate avoided pollutants from operation of offroad construction and lawn and garden equipment. CARB’s California Climate Investments Quantification Methodology Emission Factor Database includes detailed methodology including equations used for the calculation of co-benefits for each listed

¹²⁰ 200,000 VMT x 0.0047 g/mile gasoline = 940 g PM_{2.5} – (200,000 VMT x 0.0002 g/mile) = 940 g PM_{2.5} – 40 g PM_{2.5} = 900 g PM_{2.5} avoided (or 2 lbs PM_{2.5} avoided) through vehicle electrification.

pollutant.¹²¹ As an example, the equation to calculate NOx emissions avoided from a chainsaw (commercial) over a year period is as follows:

$$\text{NO}_x \text{ emissions} = \frac{(\text{EF}_{\text{NO}_x} \times \text{Horsepower} \times \text{Load Factor} \times \text{Hours/yr})}{454} \times \text{Years}$$

Where:

NO_x emissions = Pounds of NO_x avoided

EF_{NO_x} = Grams of NO_x emitted per horsepower-hour (44.552 g/bhp-hr)

Horsepower = Maximum average rated horsepower (1.9 hp)

Load Factor = Equipment specific load factor (0.7)

Hours/yr = Annual Use (100.9 hours)

Years = Quantification Period (1 year)

In this example, electrifying a chainsaw (commercial) would result in the avoidance of 13.2 lbs NO_x per year.¹²²

¹²¹ CARB, 2023b

¹²² (44.552 g/bhp-hr x 1.9 hp x 0.7 load factor x 100.9 hr/yr) ÷ 454 g/lb x 1 year = 13.2 lbs NO_x avoided/yr

Chapter 5

Workforce Planning Analysis

The workforce planning analysis identifies key occupations for the workforce necessary to implement CCAP measures. Additionally, it presents trends in the number of jobs, projected change in jobs, and estimates current workforce shortages for the identified occupations. A skills and training assessment is also included that identifies the credentials that employers are seeking for the occupations and the training providers that offer the credentials and other similar credentials in the region. This workforce planning analysis concludes with workforce development strategies that the region could incorporate to address the shortages and other workforce challenges, ensuring successful implementation of the CCAP measures, along with funding opportunities for workforce planning.

Methods

To understand the labor market, each occupation's data related to employment was pulled from Lightcast, a commercial labor market analytics tool. Measures included jobs (the number of employees payroll for an occupation and those self-employed in an occupation), hires (number of individuals hired in the corresponding year), growth (number of new jobs from increased demand for workers), and separations (number of workers leaving the workforce) by year. Additionally, data on employment concentration was collected. Employment concentration compares how concentrated an occupation is in Inland Empire MSA compared to the nation as a whole. Values greater than one indicate a greater concentration of those jobs in the region compared to the nation, while values under one indicate a smaller concentration.

This analysis also calculated the workforce gap for each occupation. This is intended to identify any labor shortages for occupations needed to implement the CCAP measures. The following formula was used to calculate the workforce gap:

Workforce Gap = Supply (hires) - Demand (growth + separations)

Supply is defined as the number of positions filled in a given year with new hires. Demand is the number of workers needed to fill new positions, and the number needed to fill the positions from separations. A positive value means supply is greater than demand, indicating a surplus of workers for the occupation whereas a negative value indicates a shortage of workers for the occupation. It's important to note that the workforce gap analysis does not factor into demand the number of new jobs that would be created by CCAP measure implementation, it is based on current labor market conditions in the region.

Building Energy

CCAP measures under the Building Energy Sector include installation of solar PV and increased energy efficiency through weatherization, retrofitting buildings, transitioning to LED lighting, and cooling outdoors through shade trees, rooftop gardens, cool pavements, and cool roofs. Additionally, household appliances will transition from using exclusively natural gas to electricity.

A wide variety of occupations are needed to meet those needs. For increased clean energy production, solar photovoltaic installers, electricians, and other related occupations will help install rooftop solar panels along with energy storage capacity. Various occupations in the construction trades will help implement energy efficiency components for homes and other buildings, including HVAC-R technicians installing heat pumps. Shade trees and rooftop gardens will be installed by landscaping and groundskeeping workers along with requiring work from tree trimmers and pruners. Cool roofs and pavements are constructed by roofers and roofing helpers. Appliance electrification will require electricians, plumbers, home appliance repairers, and HVAC mechanics and installers. Highway maintenance workers would install LED bulbs for outdoor lights.

Table 5-1 displays the number of workers in these roles for the Riverside-San Bernardino-Ontario MSA in 2015, 2025, and projected for 2035, percent change between 2015 and 2025, projected percent change between 2025 and 2035, and the employment concentration. The occupations with the most growth in the past 10 years were solar photovoltaic installers, HVAC-R mechanics and installers, compliance officers, and highway maintenance workers. These roles are projected to grow, albeit at a slower pace over the next 10 years. Helper-level positions for trades occupations all declined in the past 10 years, but are expected to have a modest rebound in the next 10 years.

For occupations required to produce more renewable energy and storage, electricians, solar photovoltaic installers, roofers, and power plant operators had significant growth and all but power plant operators are expected to continue to increase. Electrical and electronics repairers, power plant operators, and power distributors and dispatchers are projected to have no growth or small declines in employment in the next 10 years.

For activities related to increasing the energy efficiency of buildings, there is a similar mix of occupations with growth and decline. As mentioned above, compliance officers and HVAC-R mechanics had dramatic growth in the past 10 years and are expected to continue to grow. Carpenters, plumbers, and construction laborers had and are projected to continue modest growth. Helper-level positions and insulation workers saw a decline in positions the past 10 years, though are projected to have modest growth in the next 10 years.

For appliance electrification, home appliance repairer positions have declined in the past 10 years but are projected to recover and surpass the 2015 level by 2035. Highway maintenance workers, who will upgrade outdoor lights, have grown dramatically in the past 10 years and are projected to continue to grow modestly. For landscapers and tree trimmers, the modest declines of the past 10 years are projected to continue for tree trimmers and slightly reverse for landscapers. For the occupations needed to install cool roofs, roofers gained positions and are projected to continue whereas helper-level roofers declined, but are projected to have modest growth moving forward.

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015- 2025	Percent Job Change 2015- 2025	Projected Job Change 2025- 2035	Percent Projected Job Change 2025- 2035	2025 Employment Concentration
Carpenters	19,858	20,278	20,609	420	2%	331	2%	1.75
Compliance Officers	1,954	3,813	4,125	1,860	95%	311	8%	0.84

Table 5-1
Employment and Job Concentration in Building Energy Occupations

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Construction and Building Inspectors	976	1,524	1,654	548	56%	130	9%	0.91
Construction Laborers	17,480	18,061	19,236	582	3%	1,175	7%	1.12
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	245	267	268	22	9%	0	0%	0.80
Electricians	7,147	9,591	10,680	2,445	34%	1,088	11%	1.02
First-Line Supervisors of Construction Trades and Extraction Workers	6,201	10,422	11,058	4,221	68%	636	6%	1.05
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,267	6,914	7,597	3,647	112%	683	10%	1.33
Helpers--Carpenters	429	165	170	-264	-61%	5	3%	0.63
Helpers--Electricians	670	663	700	-7	-1%	37	6%	0.80
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	424	192	229	-232	-55%	37	19%	0.35
Helpers--Roofers	134	40	52	-94	-70%	11	28%	0.73
Highway Maintenance Workers	433	783	1,017	351	81%	234	30%	0.45
Home Appliance Repairers	590	439	454	-151	-26%	16	4%	0.96
Insulation Workers, Floor, Ceiling, and Wall	278	237	290	-41	-15%	52	22%	0.52
Landscaping and Groundskeeping Workers	20,933	20,541	20,733	-392	-2%	192	1%	1.44
Plumbers, Pipefitters, and Steamfitters	4,986	5,101	5,534	115	2%	432	8%	0.87
Power Distributors and Dispatchers	177	165	150	-12	-7%	-15	-9%	1.37
Power Plant Operators	296	327	292	31	11%	-35	-11%	0.86
Roofers	2,126	3,019	3,423	893	42%	404	13%	1.53
Solar Photovoltaic Installers	374	950	1,186	575	154%	236	25%	2.94
Tree Trimmers and Pruners	1,381	1,173	1,150	-208	-15%	-24	-2%	1.51

Source: Lightcast

The estimated current labor force gaps for Building Energy occupations are shown in **Table 5-2**. A few occupations are projected to have a shortage of workers in 2025, including solar photovoltaic installers, HVAC mechanics and installers, electricians, and plumbers, pipefitters, and steamfitters. These are critical positions to generate clean energy and create more energy efficient buildings. To build more energy, more electrician positions will be needed, along with rooftop solar installers, and roofers. New climate policies will likely spur more demand for nearly all of these roles, with possible exceptions for positions like power plant operators whose positions may change, but not increase in demand. Many of the positions that have a small surplus in workers will see increased demand from CCAP measures and other climate related policies and may experience shortages in the future.

Table 5-2
Supply, Demand, and Workforce Gaps for Energy Building Occupations in 2025

Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Electricians	9,591	5,004	223	4,851	-70
Plumbers, Pipefitters, and Steamfitters	5,101	2,691	116	2,606	-30
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	6,914	3,896	158	3,763	-25
Solar Photovoltaic Installers	950	734	49	706	-21
Home Appliance Repairers	439	127	4	124	0
Power Distributors and Dispatchers	165	32	-1	26	6
Helpers--Pipefitters, Plumbers, Pipefitters, and Steamfitters	192	398	9	382	7
Highway Maintenance Workers	783	212	39	166	7
Insulation Workers, Floor, Ceiling, and Wall	237	186	10	169	8
Helpers--Roofers	40	130	3	117	10
Tree Trimmers and Pruners	1,173	682	2	670	11
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	267	103	2	89	12
Construction and Building Inspectors	1,524	504	30	461	13
Power Plant Operators	327	78	-4	61	20
Helpers--Electricians	663	1,370	9	1,339	22
Helpers--Carpenters	165	489	3	463	23
Compliance Officers	3,813	1,338	68	1,242	29
First-Line Supervisors of Construction Trades and Extraction Workers	10,422	4,566	189	4,329	49
Roofers	3,019	2,538	105	2,319	115
Construction Laborers	18,061	11,498	284	11,024	191
Landscaping and Groundskeeping Workers	20,541	10,645	102	10,309	234
Carpenters	20,278	13,324	163	12,609	552

Source: Lightcast and ICF

On-Road Transportation

The CCAP recommends several measures to reduce GHG emissions from on-road transportation in the Riverside-San Bernardino-Ontario MSA. These include increased density, installation of bike and pedestrian infrastructure, mass transit/public transportation expansions, EV programs, congestion pricing, and other traffic calming programs.

A wide variety of occupations are needed to accomplish those goals. For increasing density, impacted occupations are primarily construction-related, including carpenters, electricians, and HVAC mechanics and installers, who would build new, more dense homes. Additionally, urban and regional planners, compliance officers, and building inspectors would need to help oversee that new construction. Bike and pedestrian infrastructure will require construction laborers, paving, surfacing, and tamping equipment operators, and operating engineers. Mass transit and public transit improvements involve bus drivers, locomotive engineers, and other rail operators. EV programs will also require electricians, along with electronic equipment installers for motor vehicles, transportation equipment, and substations.

Table 5-3 displays the number of workers in these roles for the Riverside-San Bernardino-Ontario MSA in 2015, 2025, and projected for 2035, percent change between 2015 and 2025, projected percent change between 2025 and 2035, and the employment concentration. Over the past ten years several of these occupations have had dramatic changes in the number of employees. For example, the number HVAC-R mechanics and installers has doubled in the past 10 years and is projected to further increase by nearly 10% in the next 10 years. Other positions

have had a decrease in the number of positions, such as railroad conductors and operators, locomotive engineers, and construction helper-level positions for carpentry, electrician, and plumbing. Nearly every position related to the on-road actions will increase the number of positions from 2025 to 2035, though at a modest rate. Employment concentration in 2025 is also particularly low for helper-level positions relative the nation as a whole. Many of the positions related to the operation of public transit, including bus drivers, locomotive engineers, and railroad conductors have a higher employment concentration, even as they have declined in number of positions in the past ten years. The greatest expected growth over the next ten years are for helper-level pipelayers and plumbers, highway maintenance workers, and insulation workers.

Table 5-3
Employment and Job Concentration in On-Road Transportation Occupations

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Architects, Except Landscape and Naval	829	878	954	49	5.9%	76	8.6%	0.56
Bus Drivers, Transit and Intercity	1,598	2,933	3,381	1,335	83.6%	448	15.3%	1.24
Carpenters	19,858	20,278	20,609	420	2.1%	331	1.6%	1.75
Civil Engineers	2,625	3,746	4,138	1,121	42.7%	392	10.5%	0.91
Compliance Officers	1,954	3,813	4,125	1,860	95.2%	311	8.2%	0.84
Construction and Building Inspectors	976	1,524	1,654	548	56.1%	130	8.5%	0.91
Construction Laborers	17,480	18,061	19,236	582	3.3%	1,175	6.5%	1.12
Electrical and Electronics Installers and Repairers, Transportation Equipment	191	98	108	-93	-48.7%	10	10.2%	0.81
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	245	267	268	22	9.1%	0	0.0%	0.80
Electricians	7,147	9,591	10,680	2,445	34.2%	1,088	11.3%	1.02
Electronic Equipment Installers and Repairers, Motor Vehicles	78	126	118	48	61.9%	-9	-6.8%	1.23
First-Line Supervisors of Construction Trades and Extraction Workers	6,201	10,422	11,058	4,221	68.1%	636	6.1%	1.05
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,267	6,914	7,597	3,647	111.6%	683	9.9%	1.33
Helpers--Carpenters	429	165	170	-264	-61.5%	5	2.9%	0.63
Helpers--Electricians	670	663	700	-7	-1.0%	37	5.6%	0.80
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	424	192	229	-232	-54.8%	37	19.4%	0.35
Highway Maintenance Workers	433	783	1,017	351	81.1%	234	29.9%	0.45
Insulation Workers, Floor, Ceiling, and Wall	278	237	290	-41	-14.6%	52	22.0%	0.52
Locomotive Engineers	828	636	673	-192	-23.1%	36	5.7%	1.46
Operating Engineers and Other Construction Equipment Operators	3,894	4,889	5,378	995	25.5%	489	10.0%	0.89
Paving, Surfacing, and Tamping Equipment Operators	527	261	296	-266	-50.4%	34	13.1%	0.48
Plumbers, Pipefitters, and Steamfitters	4,986	5,101	5,534	115	2.3%	432	8.5%	0.87
Railroad Brake, Signal, and Switch Operators and Locomotive Firers	352	252	271	-101	-28.6%	19	7.7%	1.38
Railroad Conductors and Yardmasters	927	883	949	-44	-4.8%	66	7.5%	1.34

Subway and Streetcar Operators	32	172	203	139	430.3%	32	18.4%	0.73
Traffic Technicians	40	64	76	24	60.0%	12	18.0%	0.59
Urban and Regional Planners	546	572	659	26	4.8%	87	15.2%	1.15

Source: Lightcast

Table 5-4 displays the projected supply, demand, and potential workforce shortages for these occupations. As with the energy sector, several occupations are projected to have a worker shortage in 2025. Several of these roles are related to construction in the trades, such as electricians, HVAC-R mechanics and installers, and plumbers. Architects and civil engineers are also important for construction. Other occupations have no surplus or just a few surplus workers, such as subway and railroad operators, locomotive engineers, traffic technicians, and construction equipment operators. If the policies laid out in the CCAP increase demand for these types of roles the MSA may have a workforce shortage for those occupations.

Table 5-4 Supply, Demand, and Workforce Gaps for On-Road Transportation Occupations in 2025					
Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Electricians	9,591	5,004	223	4,851	-70
Plumbers, Pipefitters, and Steamfitters	5,101	2,691	116	2,606	-30
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	6,914	3,896	158	3,763	-25
Civil Engineers	3,746	1,499	86	1,422	-10
Architects, Except Landscape and Naval	878	195	15	187	-7
Electronic Equipment Installers and Repairers, Motor Vehicles	126	70	-1	73	-2
Subway and Streetcar Operators	172	24	6	19	0
Railroad Brake, Signal, and Switch Operators and Locomotive Firers	252	103	1	101	0
Railroad Conductors and Yardmasters	883	330	5	325	0
Electrical and Electronics Installers and Repairers, Transportation Equipment	98	72	1	70	1
Locomotive Engineers	636	246	-1	244	2
Traffic Technicians	64	30	2	25	3
Paving, Surfacing, and Tamping Equipment Operators	261	142	7	129	6
Operating Engineers and Other Construction Equipment Operators	4,889	2,549	116	2,427	6
Helpers--Pipefitters, Plumbers, Pipefitters, and Steamfitters	192	398	9	382	7
Highway Maintenance Workers	783	212	39	166	7
Insulation Workers, Floor, Ceiling, and Wall	237	186	10	169	8
Urban and Regional Planners	572	144	16	120	9
Helpers--Roofers	40	130	3	117	10
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	267	103	2	89	12
Construction and Building Inspectors	1,524	504	30	461	13

Table 5-4 Supply, Demand, and Workforce Gaps for On-Road Transportation Occupations in 2025					
Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Helpers--Carpenters	165	489	3	463	23
Compliance Officers	3,813	1,338	68	1,242	29
First-Line Supervisors of Construction Trades and Extraction Workers	10,422	4,566	189	4,329	49
Construction Laborers	18,061	11,498	284	11,024	191
Bus Drivers, Transit and Intercity	2,933	938	87	650	201
Carpenters	20,278	13,324	163	12,609	552

Source: Lightcast and ICF

Off-Road Transportation

The CCAP contains two measures to reduce GHG emissions from off-road transportation and equipment. First, transitioning to zero-emission offroad equipment used in landscaping, construction, along with other fields. Workers in these fields, landscaping workers and construction equipment operators, would need to be trained with the new equipment. Additionally, the CCAP recommends jurisdictions limit idling time for construction equipment to three minutes. Compliance officers would need to be trained to enforce this measure.

Table 5-5 displays the employment trends for workers in these roles for the Riverside-San Bernardino-Ontario MSA. Over the past ten years compliance officers and operating engineers have had an increased number of positions while landscaping workers have slightly declined. Over the next 10 years, each occupation is expected to gain jobs, though less than 1% growth for landscaping workers. Relative to the nation as a whole, there is a greater concentration of landscaping workers but a lower concentration of compliance officers and operating engineers.

Table 5-5 Employment and Job Concentration in Off-Road Transportation Occupations								
Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Compliance Officers	1,954	3,813	4,125	1,860	95.2%	311	8.2%	0.84
Landscaping and Groundskeeping Workers	20,933	20,541	20,733	-392	-1.9%	192	0.9%	1.44
Operating Engineers and Other Construction Equipment Operators	3,894	4,889	5,378	995	25.5%	489	10.0%	0.89

Source: Lightcast

Table 5-6 displays the workforce gap information. Each occupation is projected to have a workforce surplus in 2025. Transitioning to new equipment may not ultimately impact the demand for these positions, but will require re-skilling.

Table 5-6 Supply, Demand, and Workforce Gaps for Off-Road Transportation Occupations in 2025					
Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Operating Engineers and Other Construction Equipment Operators	4,889	2,549	116	2,427	6
Compliance Officers	3,813	1,338	68	1,242	29

Table 5-6
Supply, Demand, and Workforce Gaps for Off-Road Transportation Occupations in 2025

Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Landscaping and Groundskeeping Workers	20,541	10,645	102	10,309	234

Source: Lightcast and ICF

Solid Waste

Zero waste initiatives, like expansion of recycling and composting facilities or expansion of markets for material reuse, will impact five occupations: laborers and freight, stock, and material movers, who typically work within warehouses, industrial truck and tractor operators, who may also work at warehouses, storage facilities, or construction sites, refuse and recyclable material collectors, heavy and tractor-trailer truck drivers, who transport goods to and from warehouses, and light truck drivers.

Table 5-7 displays the employment trends for these occupations. In the past decade, each of these occupations have grown by at least 25 percent, with heavy and tractor-trailer truck drivers and laborers and freight, stock, and material movers nearly doubling in size. The jobs in each occupation is expected to expand in the next ten years as well. Light truck driver positions are expected to have the highest growth rate at 17 percent and industrial truck and tractor operator positions are expected to have the lowest growth rate of just under 10 percent. All occupations except refuse and recyclable material collectors have significantly higher employment concentrations than the nation as a whole. This is the result of the large goods movement sector in the region.

Table 5-7
Employment and Job Concentration in Waste Occupations

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Heavy and Tractor-Trailer Truck Drivers	28,186	50,305	56,152	22,119	78.5%	5,847	11.6%	1.90
Industrial Truck and Tractor Operators	22,411	29,147	31,883	6,736	30.1%	2,737	9.4%	3.26
Laborers and Freight, Stock, and Material Movers, Hand	45,805	81,514	91,172	35,709	78.0%	9,657	11.8%	2.37
Light Truck Drivers	12,132	15,493	18,169	3,362	27.7%	2,676	17.3%	1.25
Refuse and Recyclable Material Collectors	921	1,216	1,355	295	32.0%	139	11.4%	0.72

Source: Lightcast

Table 5-8 displays the projected supply, demand, and potential workforce shortages for these occupations. Nearly all of these positions currently have large workforce shortage, with laborers and freight movers with the greatest shortage of nearly 5,000 workers. Relative to the projected employment in 2025, each shortage is around 5 percent of the total workforce size. Only refuse and recyclable material collectors have a worker surplus in 2025. The high demand in the region for warehouse workers, truck and tractor drivers to operate at warehouses, and drivers to deliver goods to and from warehouses, associated with the large goods movement sector in the region, drives the high demand for these workers.

Table 5-8
Supply, Demand, and Workforce Gaps for Waste Occupations in 2025

Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Laborers and Freight, Stock, and Material Movers, Hand	81,514	71,253	2,518	73,531	-4,795
Heavy and Tractor-Trailer Truck Drivers	50,305	26,872	1,332	27,570	-2,030
Industrial Truck and Tractor Operators	29,147	17,753	968	18,238	-1,453
Light Truck Drivers	15,493	9,389	457	9,552	-620
Refuse and Recyclable Material Collectors	1,216	532	34	486	12

Source: Lightcast and ICF

Agriculture

The primary activity under agriculture is supporting local agriculture and community gardens to produce and distribute food locally. Local agricultural jobs would include farmers, ranchers, agricultural and equipment operators, farmworkers, among other agricultural workers.

Table 5-9 displays the employment trends for these jobs. In the past 10 years, farm, ranchers, and other managers have decreased slightly and farmworkers and laborers have declined by nearly 20 percent. Jobs in these fields are expected to decline in the next ten years by about 5 percent. In contrast, agricultural equipment operators and other forms of agricultural workers have expanded by 62 percent and 46 percent respectively. These two occupations are also expected to increase, albeit at a slower pace, over the next ten years.

Table 5-9
Employment and Job Concentration in Agricultural Occupations

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Agricultural Equipment Operators	607	982	1,006	375	61.7%	24	2.5%	1.14
Agricultural Workers, All Other	563	821	831	258	45.8%	10	1.2%	0.81
Farmers, Ranchers, and Other Agricultural Managers	2,434	2,333	2,217	-101	-4.1%	-116	-5.0%	0.36
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	8,280	6,661	6,366	-1,619	-19.6%	-295	-4.4%	1.00

Source: Lightcast

Table 5-10 displays the projected supply, demand, and potential workforce shortages for these occupations. All occupations have a high rate of turnover, with hiring in 2025 approaching or exceeding the projected employment for the workforce in nearly all of these occupations. While three of the occupations saw a decline in jobs from 2024 to 2025, all still had a workforce surplus. The high number of separations may be attributable to low wages and the seasonal nature of some of these jobs. Encouragement in buying local produce may increase demand for these roles, potentially reversing the projected loss of positions for agricultural managers and farmworkers.

Table 5-10
Supply, Demand, and Workforce Gaps for Agricultural Occupations in 2025

Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Agricultural Workers, All Other	821	770	-1	757	14
Agricultural Equipment Operators	982	1,832	3	1,779	49
Farmers, Ranchers, and Other Agricultural Managers	2,333	610	-33	591	51

Table 5-10
Supply, Demand, and Workforce Gaps for Agricultural Occupations in 2025

Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	6,661	11,312	-57	11,248	121

Source: Lightcast and ICF

Water and Wastewater

There are three proposed actions to reduce GHG emissions through water and wastewater: recycled water use, water efficiency, and wastewater equipment upgrades. Recycling water is the practice of using wastewater for beneficial purposes, such as agricultural irrigation or industrial processes. Expanding this practice requires increased infrastructure investments with work conducted by pipelayers, water and wastewater treatment plant and system operators, and operating engineers. Water efficiency measures require plumbers, pipefitters, and steamfitters to install water efficient appliances, plumbing, and irrigation systems. For wastewater equipment upgrades, wastewater treatment providers would upgrade their water treatment systems with more energy-efficient equipment. This would impact the water and wastewater treatment plant and system operators who work at those wastewater treatment plants.

Table 5-11 displays the employment trends for the workers needed to implement the water and wastewater measures. Pipelayers and helper-level positions saw a decline of nearly half from 2015 to 2025. Both are projected to increase in the next ten years, but not to the levels from 2015. Plumbers, pipefitters, and steamfitter positions increased by just above 2% from 2015 to 2025 and are projected to increase by 9% from 2025 to 2035. Wastewater treatment plant operators and operating engineers also saw job growth in the past ten years (14% and 26%, respectively) and are expected to continue that growth through 2035. All of these occupations except water treatment plant and system operators have a lower employment concentration than the nation as a whole. Most noticeably, the concentration of helper-level positions is particularly low.

Table 5-11
Employment and Job Concentration in Waste and Wastewater Occupations

Description	2015 Jobs	2025 Jobs	2035 Jobs	Job Change 2015-2025	Percent Job Change 2015-2025	Projected Job Change 2025-2035	Percent Projected Job Change 2025-2035	2025 Employment Concentration
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	424	192	229	-232	-54.8%	37	19.4%	0.35
Operating Engineers and Other Construction Equipment Operators	3,894	4,889	5,378	995	25.5%	489	10.0%	0.89
Pipelayers	585	312	333	-273	-46.6%	20	6.5%	0.70
Plumbers, Pipefitters, and Steamfitters	4,986	5,101	5,534	115	2.3%	432	8.5%	0.87
Water and Wastewater Treatment Plant and System Operators	1,313	1,501	1,599	188	14.3%	98	6.6%	1.09

Source: Lightcast

Table 5-12 displays the projected supply, demand, and potential workforce shortages for these occupations. Plumbers, pipefitters, and steamfitter positions and pipelayer positions have a workforce shortage in 2025. Shortages of these workers would make installation of infrastructure for water efficiency and water recycling more difficult. The other occupations have small surpluses, so an increase in demand induced by these policies could lead to a workforce shortage.

While some actions would simply modify the work of wastewater treatment plant operators, they will likely spur more positions for trades and construction workers.

Table 5-12 Supply, Demand, and Workforce Gaps for Waste and Wastewater Occupations in 2025					
Occupation	Employment 2025	2025 Hires	Growth (New Jobs)	Separations 2025	Workforce Shortage
Plumbers, Pipefitters, and Steamfitters	5,101	2,691	116	2,606	-30
Pipelayers	312	173	8	172	-7
Operating Engineers and Other Construction Equipment Operators	4,889	2,549	116	2,427	6
Helpers--Pipefitters, Plumbers, Pipefitters, and Steamfitters	192	398	9	382	7
Water and Wastewater Treatment Plant and System Operators	1,501	342	29	289	24

Source: Lightcast and ICF

Strategies/Solutions and Partnerships to Address Gaps and Workforce Challenges

To fill the labor shortages identified above, there are several proven workforce strategies. Sector strategies are considered one of the most effective workforce development approaches. They bring together multiple employers within an industry to identify shared talent needs and collaborate with education providers and workforce agencies to address them. These partnerships rely on intermediaries, like workforce boards, to coordinate efforts and develop tailored training solutions based on employer input. Rigorous evaluations have shown strong results, including increased employment rates and earnings, with gains sustained over many years.

Career pathways are strategies designed to help individuals gain the skills and credentials needed to enter and advance in careers, often through coordinated services and training aligned with industry needs. While closely related to sector strategies, career pathways focus more on integrating education, support services, and public benefits to create a seamless experience for job seekers. Certain programs have shown promise in improving educational attainment and, in some cases, earnings, though results have been mixed across broader evaluations. Large-scale studies have found modest gains in credential attainment but limited impact on long-term earnings or employment. Overall, while career pathways can enhance access to training and credentials, evidence of their effectiveness in boosting sustained economic outcomes remains inconsistent.

Work-based learning integrates education with hands-on job experience and is widely recognized as an effective workforce development strategy. While Registered Apprenticeships have the strongest evidence, other models—like subsidized on-the-job training—also yield strong outcomes for both workers and employers. Some programs have demonstrated significant and lasting earnings gains for young adults through targeted training and corporate internships. Youth apprenticeship efforts are expanding across the U.S., though rigorous evaluations are still underway. Meanwhile, transitional jobs and subsidized employment programs show short-term boosts in employment and earnings, especially for marginalized populations, though these effects often diminish over time. Overall, work-based learning offers promising pathways to economic mobility, particularly when well-supported and aligned with employer needs.¹²³

¹²³ McCarthy, 2025

There are several institutions in Riverside and San Bernardino Counties that offer entrance ramps to positions with projected workforce shortages. Apprenticeships, community colleges, and other private training providers all offer courses and certificates to enter these professions.

Several community colleges offer certificates for more traditional trades roles, like electricians, HVAC-R technicians, and plumbers. HVAC-R technician certification is offered at 16 community colleges, electrician programs are offered at 8 community colleges, and plumbing programs are offered at 2 community colleges in the region. Additionally, four community colleges offer certifications geared towards entering the solar industry as a rooftop installer. Some community colleges also offer courses for attaining a Commercial Driver's License and forklift certification. CSU-San Bernardino offers certifications in the trades as well.

Registered apprenticeship programs in the region are primarily geared toward electricians, HVAC-R technicians, and plumbers. Six organizations, including local unions and community colleges, sponsor electrician apprenticeship programs, partnering with numerous private employers. Four organizations sponsor apprenticeships in HVAC-R roles and six organizations sponsor apprenticeships for plumber roles. The registered apprenticeship model is a proven strategy to give workers the education they need paired with on-the-job training necessary to excel in the role.

Numerous private training providers offer programs for other positions. Twenty providers offer courses to train for a commercial driver's licenses and five provide forklift certification. Further, ten organizations offer certifications that are used by industrial truck and tractor operators. Two training providers offer certifications needed for solar photovoltaic installers. For more details on the providers, please see Appendix F.

A primary focus in addressing the workforce shortages should be for occupations in the goods movement sector, as those have by far the greatest shortages in the region. While Commercial Driver License programs are readily available, there is only one registered apprenticeship program in the region for these occupations (sponsored by Teamsters Joint Council 42). Working to build more partnerships between educational institutions, training providers, labor organizations, and employers could help fill this shortage. In particular, local education institutions have few programs for these positions compared to other trades positions like electricians. Offering the certifications necessary for these positions at community colleges would make these positions more accessible to the public. Additionally, implementing early education and awareness programming to the future workforce could generate further interest in these careers.

Positions related to logistics frequently require a commercial driver's license, either Class A or Class B. Warehouse workers frequently need a forklift certification and/or a pallet jack certification. To operate more specialized vehicles, some positions require hazmat endorsement, hazardous materials certification, or a tanker endorsement.

For electricians, many positions require a journeyman electrician license, which allows an electrician to work unsupervised. For energy efficiency related roles, a LEED Green Associate credential is often desired by employers. Plumbers also have a journey-level certificate to allow them to work without supervision. HVAC mechanics are required to receive EPA-sponsored certifications to handle ozone depleting refrigerants. Solar photovoltaic installers have a few avenues to become qualified for installation of rooftop solar, including programs sponsored by

the North American Board of Certified Energy Practitioners (NABCEP) and the National Center for Construction Education & Research (NCCER). **Table 5-13** list the top certifications for these occupations required by employers.

Table 5-13 Top Certifications Required by Employers	
Occupation	Top Certifications
Heavy and Tractor-Trailer Truck Drivers	Commercial Driver's License (CDL)
	CDL Class A License
	CDL Class B License
	Tanker Endorsement
Laborers and Freight, Stock, and Material Movers, Hand	Commercial Driver's License (CDL)
	Forklift Certification
	Pallet Jack Certification
Industrial Truck and Tractor Operators	OSHA
	Commercial Driver's License (CDL)
	Hazardous Materials Certification
	Certified Crane Operator
Light Truck Drivers	Commercial Driver's License (CDL)
	CDL Class B License
	Hazmat Endorsement
Electricians	Journeyman Electrician License
	Master Electrician Certificate
	Certified Energy Manager
	LEED Green Associate
Plumbers, Pipefitters, and Steamfitters	Journey Level Pipefitter-Steamfitter
	IAPMO Plumbing Inspector
	EPA Section 608 Technician Certification
	EPA Universal Certification
HVAC	EPA 608 Technician Certification
	EPA 608 Certification
	HVAC Excellence Certification
	North American Technician Excellence (NATE) Certification
Solar Photovoltaic Installers	NABCEP PV Installation Professional (PVIP) Certification
	Photovoltaics Installer/Designer (PV2) certification
	PV Installer Specialist (PVIS) Board Certification
	NCCER Solar Photovoltaics

Workforce Funding

San Bernardino County offers a variety of workforce funding sources and programs through its Workforce Development Department (WDD), primarily supported by federal and state funding. Federal workforce funding is provided by the U.S. Department of Labor, U.S. Department of Education, and U.S. Department of Health and Human Services. These funds support a wide range of programs, including WIOA Title I, YouthBuild, Trade Adjustment Assistance (TAA), and National Dislocated Worker Grants (NDWG).

In addition, IREN invests in both county (Riverside and San Bernardino) Workforce board to enhance their workforce offerings with focus on energy training, employment, and businesses. An example of the investment includes a \$3 million investment to expand clean energy training and career programs in Riverside and San Bernardino counties.¹²⁴ IREN also has an Energy

¹²⁴ <https://iren.gov/DocumentCenter/View/321/Clean-Energy-Workforce-Partnerships-I-REN-September-2025>

Fellowship, where IREN recruits local talent and job seekers, and places them at local public sector agencies (i.e., cities, counties, special districts, etc.) to work on relevant energy projects.

Workforce Innovation and Opportunity Act (WIOA) Programs:

WIOA programs, administered by the U.S. Department of Labor, Employment and Training Administration (ETA), provide the largest amount of workforce funding. WIOA provides funding to help job seekers access employment, education, training, and support services. Some of the major WIOA programs include:

- **Adult & Dislocated Worker Programs:** Provides job seekers with training, career counseling, and job placement services. The Adult program serves individuals and helps employers meet their workforce needs. It enables workers to obtain jobs by providing them with job search assistance and training opportunities. The Dislocated Worker program helps individuals that become dislocated workers as a result of job loss, mass layoffs, global trade dynamics, or transitions in economic sectors, by providing services to assist them in re-entering the workforce.
- **National Dislocated Worker Grants:** provides supplemental funding in response to major economic dislocations or other events that cause or contribute to a shortage of existing WIOA Dislocated Worker formula funds and other relevant resources in states and local areas.
- **JobCorps:** Provides career training that helps eligible young people ages 16 through 24 complete their high school education, trains them for meaningful careers, and assists them with obtaining employment.
- **Youth Build:** Provides pre-apprenticeship programs training and educational services for opportunity youth ages 16-24 who left school without a secondary diploma. Participants learn vocational skills in construction and other in-demand industries.

Wagner-Peyser Act: Provides funds to states to operate the public workforce system, which includes employment services like job placement and career counseling.

Workforce funding from the U.S. Department of Health and Human Services is also available through state programs, including the CalWORKS Subsidized Employment Program, CalWORKS Youth Employment Program, and the CalFRESH Employment and Training Program.

Other state funding for workforce development includes California's Employment Training Panel (ETP) which provides funding to employers in the state to support customized job skills training for employees.

Chapter 6

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Riverside-San Bernardino-Ontario MSA

Comprehensive Climate Action Plan Appendices

Coachella Valley Association of Governments, San Bernardino
County, and Western Riverside Council of Governments

TABLE OF CONTENTS

Comprehensive Climate Action Plan

Appendix A. CVAG City Profiles	A-1
City of Blythe.....	A-2
City of Cathedral City	A-10
City of Coachella	A-19
City of Desert Hot Springs.....	A-28
City of Indian Wells.....	A-37
City of Indio	A-45
City of La Quinta	A-53
City of Palm Desert.....	A-61
City of Palm Springs	A-70
City of Rancho Mirage.....	A-78
Appendix B. WRCOG GHG Reduction Measures	B-1
Appendix C. GHG Quantification Methods.....	C-1
GHG Inventory Methodology	C-1
GHG Reduction Measures Methodology.....	C-13
References.....	C-40
Appendix D. Authority to Implement and Intersection with Other Funding	
Availability	D-1
General Law and Charter Cities.....	D-1
Southern California Association of Governments	D-1
County of Riverside	D-2
County of San Bernardino.....	D-3
Coachella Valley Association of Governments	D-3
San Bernardino County Transportation Authority and San Bernardino Council of Governments.....	D-4
Western Riverside Council of Governments.....	D-4
South Coast Air Quality Management District	D-5
Mojave Desert Air Quality Management District.....	D-6
Funding Sources.....	D-8
Appendix E. Workforce Development Programs.....	E-1
Appendix F. Engagement Summary	F-1
Engagement Activities in MSA	F-1
Decarbonization Advisory Group	F-4
Climate Resilience Nexus Summit.....	F-4
Climate Action Conference.....	F-5
Climate Resilient Jobs for the Future Initiative	F-5
FISTS 2024: 4 th IEEE Forum for Innovative Sustainable Transportation Systems	F-5
Analysis of Existing CAPs.....	F-5
Survey and Information Sharing.....	F-6

Appendix A. CVAG City Profiles

This appendix summarizes the GHG emissions inventory and forecasted GHG emissions for each of the 10 jurisdictions in the Coachella Valley Association of Governments (CVAG). The emissions inventory and forecast include GHG emissions from the following sources and sinks:

- Building energy use (residential and non-residential electricity and natural gas use);
- On-road transportation (light-, medium-, and heavy-duty vehicles);
- Off-road equipment;
- Agriculture;
- Solid waste management;
- Water transport, distribution, and treatment; and
- Natural and working lands.

The 2023 inventory results provide a baseline from which to forecast future year emissions in 2030 and 2045. The emissions forecast represents a business-as-usual (BAU) scenario, meaning that the scenario would occur in the absence of further action taken by local and state governments. The ten jurisdictions participating in this effort are:

Blythe	Indio
Cathedral City	La Quinta
Coachella	Palm Desert
Desert Hot Springs	Palm Springs
Indian Wells	Rancho Mirage

City of Blythe



As a member of the Coachella Valley Association of Governments (CVAG), the City of Blythe is taking action to reduce GHG emissions that are occurring throughout the community. Included below is a summary of Blythe's Community GHG Inventory and Forecast, a 2030 emissions target for the community, and a summary of State, regional, and local reduction measures that will enable Blythe to make substantial progress towards that target.

The City of Blythe is located in eastern Riverside County, near the California-Arizona border along the Colorado River. It is approximately 215 miles east of Los Angeles and 150 miles west of Phoenix, accessible via Interstate 10. Blythe is part of the Southern California Association of Governments (SCAG) Regional Council District 66, which also includes Coachella, Indio, and La Quinta.

Attractions near Blythe include the Colorado River, which offers recreational activities like boating and fishing, and the Blythe Intaglios, large ancient geoglyphs on nearby desert ground. Blythe has a typical desert climate with summertime high temperatures above 100 degrees Fahrenheit (°F) and wintertime lows near 40°F.

Blythe spans 26.8 square miles, with significant portions designated for residential, agricultural, and open space uses. These land uses influence the city's greenhouse gas (GHG) profile, with primary emissions sources being on-road transportation, residential energy consumption, and industrial processes. The city had a population of 17,378 as of 2023 (DOF).

Based on socioeconomic data provided by California's Department of Finance, the City's population is expected to grow approximately 4 percent from 2023 to 2030, and 17 percent from 2023 to 2045. Households are expected to grow 9 percent from 2023 to 2030 and 23 percent from 2023 to 2045, while employment is expected to grow 4 percent and 12 percent over those same time periods.

Table A-1 presents socioeconomic data for Blythe, including population, housing (single-family and multi-family), and employment (agricultural, industrial, retail, and non-retail).

Table A-1 Blythe Socioeconomic Data			
Category	DOF		
	2023	2030	2045
Population	17,378	18,106	20,268
Households	5,248	5,712	6,449
Jobs	4,500	4,676	5,053

Greenhouse Gas Inventory and Emissions Forecasts

The City of Blythe Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions and under an "adjusted" forecast scenario that accounts for state-mandated GHG reduction programs and regional programs that affect all CVAG jurisdictions.

Table A-2 provides a summary of the City's 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-1** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-2 City Of Blythe GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	32,144	33,234	37,528
<i>Light-Duty Vehicles</i>	24,835	25,915	30,166
<i>Heavy-Duty Vehicles</i>	7,308	7,320	7,363
Building Energy	30,430	31,900	35,203
<i>Residential Electricity</i>	9,415	9,788	11,018
<i>Residential Natural Gas</i>	7,053	7,678	8,664
<i>Non-Residential Electricity</i>	13,962	14,434	15,521
<i>Non-Residential Natural Gas</i>	-	-	-
Solid Waste Management	9,622	10,016	11,544
Water Transport, Distribution, and Treatment	238	248	289
Wastewater	617	711	830
Off-Road Equipment	3,527	3,665	4,365
Agriculture	70	144	170
TOTAL ^a	76,649	79,919	89,930
<i>Natural Working Lands and Forestry ^b</i>	50,222	50,222	50,222

NOTES:

a - Totals may not sum due to rounding.

b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.

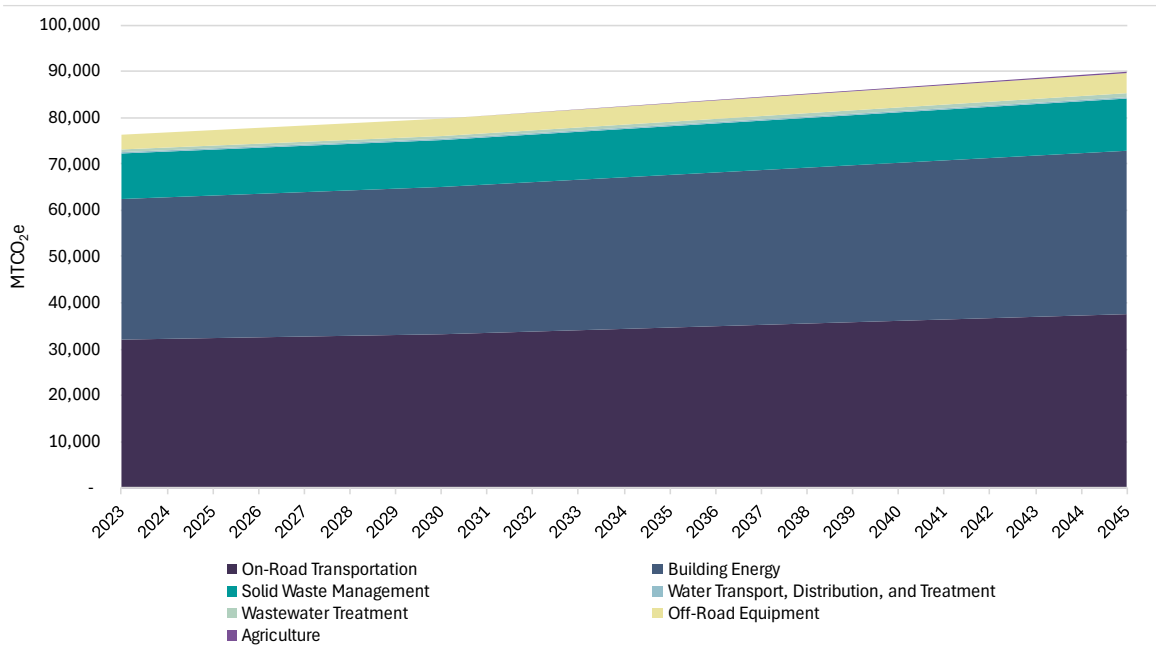
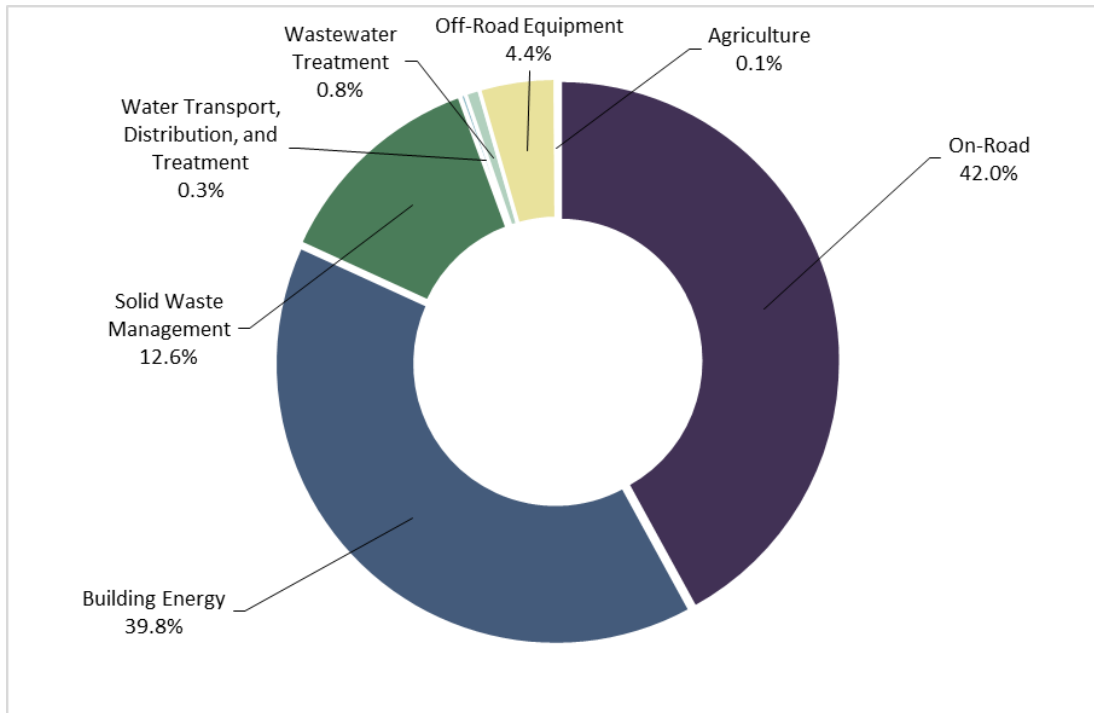
Figure A-1 City of Blythe GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

Figure A-2 shows each sector's contribution to the City of Blythe's 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 42 percent, followed by building energy at about 40 percent, and solid waste management at around 13 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-2 2023 Emissions by Sector – Blythe

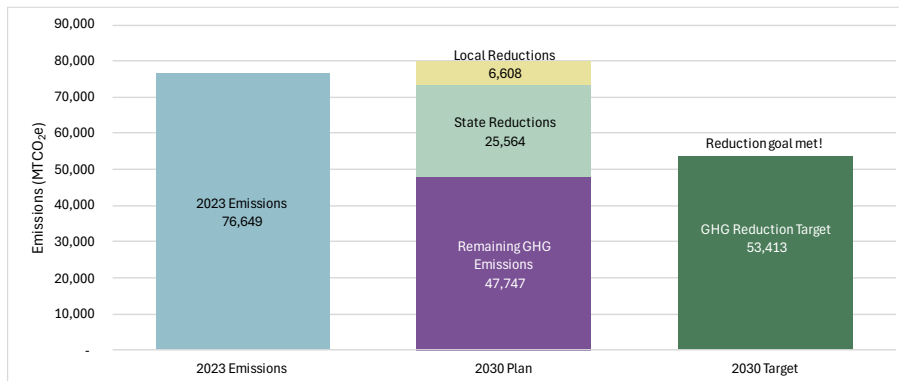


Greenhouse Gas Forecast and Reduction Targets

The City of Blythe is committed to supporting the state’s goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Blythe has set a 30 percent GHG reduction goal from 2023 levels by 2030. This equates to total annual emissions target of 53,413 MTCO₂e per year by the year 2030, based on the City’s population and jobs forecasts.

Figure A-3 shows how this target relates to the City’s business-as-usual (BAU) emissions forecast and is equivalent to a reduction of approximately 32 percent below the 2030 BAU forecast.

Figure A-3 City of Blythe 2030 GHG Reduction Target (MTCO₂e)



The bars in **Figure A-3** show Blythe’s 2023 GHG emissions total, 2030 BAU emissions forecast total, and the total emissions remaining after meeting the City’s emissions reduction target (30% below the 2023 GHG emissions level). The contribution of state and local reductions are overlaid on the 2030 BAU emissions forecast total (“2030 Plan”), representing the total emissions reductions achieved in 2030. As stated above, state reductions account for the majority (~79 percent) of the total reductions needed to achieve the 2030 target.

Table A-3 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Blythe exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Table A-3 Emissions Reductions by Sector for Blythe					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	32,144	33,234	7,959	25,275	21%
Building Energy	30,430	31,900	18,632	13,268	56%
Solid Waste Management	9,622	10,016	5,058	4,959	48%
Water Transport, Distribution, and Conveyance	238	248	86	162	32%
Wastewater Treatment	617	711	146	566	8%
Off-Road Equipment	3,527	3,665	287	3,377	4%
Agriculture	70	144	4	140	-99%
Total	76,649	79,919	32,172	47,747	38%
Goal				53,413	
Goal Met?				Yes	
Reductions Beyond Goal				5,666	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. For the City of Blythe, the anticipated reductions resulting from state measures is summarized in **Table A-4**.

Table A-4 Blythe GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	10,097	27,427
SB 350 Clean Energy and Pollution Reduction Act	6,545	2,989
Title 24 Building Energy Efficiency Standards	284	523
California Solar Mandate	401	-
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	287	882
Vehicle Efficiency Standards	5,340	10,142
Advanced Clean Cars II (ACCI)	2,444	17,212
Water		
Water Conservation Mandates	56	289
Wastewater		
Renewable Electricity in Wastewater Systems	110	295
Total Reduction from State Measures	25,564	59,759

Local Measures

This section highlights the City of Blythe's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-5** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045. NQ signifies a Not Quantified value.

Table A-5 Blythe 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	NQ	NQ
Energy-2	LED Bulbs and Fixtures	584	-

Table A-5 Blythe 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy-3	Smart Thermostat	NQ	NQ
Energy-4	Appliance Electrification Upgrades	18	-
Energy-5	Solar Window Film	NQ	NQ
Energy-6	Cool Roofs	6	-9
Energy-7	Roofline Insulation and Attic Encapsulation	NQ	NQ
Energy-8	HVAC Maintenance Program	NQ	NQ
Energy-9	Solar Installations for New Commercial and Industrial Development	NQ	NQ
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	697	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	NQ	NQ
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	176	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	197
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	NQ	273
Off-Road-2	Lawn and Garden Equipment Electrification	NQ	17
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	3,997	4,474
Waste-2	Construction and Demolition Waste Diversion	787	1,175

Table A-5 Blythe 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Waste-3	Solid Waste Diversion	169	757
Waste-4	Food Waste and Organics Diversion	104	117
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	36	-
Water-1	Increase Recycled Water Use	29	-
Water-2	Water Conservation	1	-
Total Local Reductions Anticipated ^c		6,608	7,000
NOTES: NQ – Not quantified because this measure was not selected by the city. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, Blythe is expected to meet its 2030 GHG reduction target through the combination of state regulations and local measures selected by the City. **Table A-6** below summarizes Blythe's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-6 Blythe's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO _{2e})		
	2030	2045
BAU Forecast	79,919	89,930
Total Reductions from State Measures	25,564	59,759
Total Reductions from Local Measures	6,608	7,000
Resulting Community Emissions With CCAP Implementation ^a	47,747	23,170
Emissions Target	53,413	NQ
Target Exceeded by	5,666	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of Cathedral City

The City of Cathedral City is located in the western Coachella Valley in Riverside County, California. It is approximately 8 miles east of Palm Springs and 120 miles east of Los Angeles, accessible via Interstate 10. Cathedral City is part of the Southern California Association of Governments (SCAG) Regional Council District 2, which includes Desert Hot Springs, Palm Desert, Rancho Mirage, and Palm Springs.



Attractions near Cathedral City include the Cathedral City Amphitheatre, Cimarron Golf Resort, Agua Caliente Casino, Mark Pickford and CV Rep Theatres, a regional entertainment hub. Cathedral City has a typical desert climate with summertime high temperatures above 100 degrees Fahrenheit (°F) and wintertime lows near 40°F.

Cathedral City spans 21 square miles, with significant portions designated for residential, commercial, and recreational uses. These land uses influence the city's greenhouse gas (GHG) profile, with primary emissions sources being on-road transportation, residential energy consumption, and industrial activities. The city had a population of 50,911 as of 2023 (DOF).

Based on socioeconomic data provided by California's Department of Finance, the City's population is expected to grow approximately 3 percent from 2023 to 2030, and 12 percent from 2023 to 2045. Households are expected to grow 11 percent from 2023 to 2030 and 29 percent from 2023 to 2045, while employment is expected to grow 7 percent and 23 percent over those same time periods.

Table A-7 presents socioeconomic data for Cathedral City, including population, housing (single-family and multi-family), and employment (agricultural, industrial, retail, and non-retail).

Table A-7 Cathedral City Socioeconomic Data			
Category	2023	2030	2045
Population	50,911	52,515	57,272
Households	23,097	25,699	29,818
Jobs	26,400	28,347	32,517

Greenhouse Gas Inventory and Emissions Forecasts

The Cathedral City Community GHG Inventory quantifies the annual emissions resulting from activities within the city by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU)

conditions and under an “adjusted” forecast scenario that accounts for state-mandated GHG reduction programs and regional programs that affect all CVAG jurisdictions.

Table A-8 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-4** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-8 Cathedral City GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	163,450	169,915	193,856
<i>Light-Duty Vehicles</i>	<i>125,027</i>	<i>131,057</i>	<i>153,386</i>
<i>Heavy-Duty Vehicles</i>	<i>38,422</i>	<i>38,857</i>	<i>40,470</i>
Building Energy	108,122	116,333	132,515
<i>Residential Electricity</i>	<i>33,997</i>	<i>34,991</i>	<i>38,416</i>
<i>Residential Natural Gas</i>	<i>42,325</i>	<i>47,110</i>	<i>54,629</i>
<i>Non-Residential Electricity</i>	<i>21,561</i>	<i>23,240</i>	<i>26,860</i>
<i>Non-Residential Natural Gas</i>	<i>10,238</i>	<i>10,993</i>	<i>12,610</i>
Solid Waste Management	26,457	27,275	30,467
Water Transport, Distribution, and Treatment	5,131	5,292	5,953
Wastewater	1,809	2,063	2,321
Off-Road Equipment	32,899	35,325	43,527
Agriculture	103	137	154
TOTAL^a	337,393	356,341	408,793
<i>Natural Working Lands and Forestry^b</i>	<i>58,834</i>	<i>58,834</i>	<i>58,834</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-4 Cathedral City GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

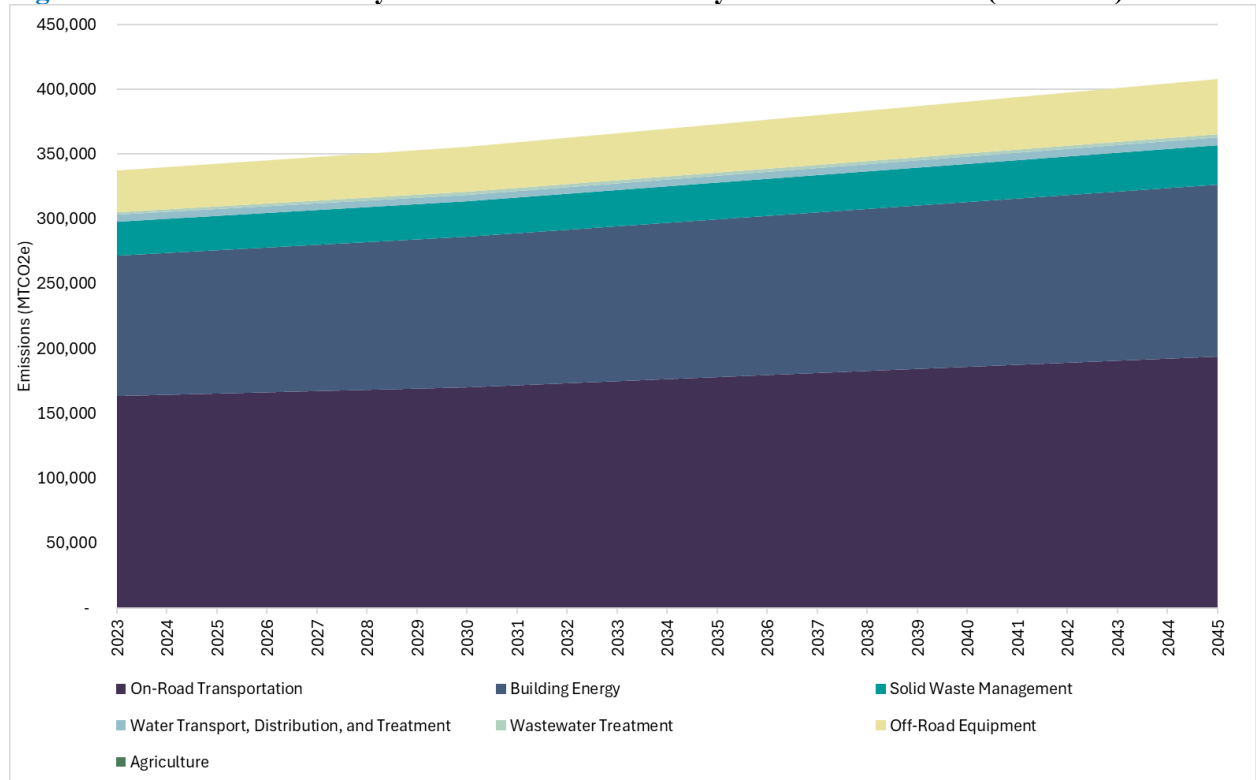
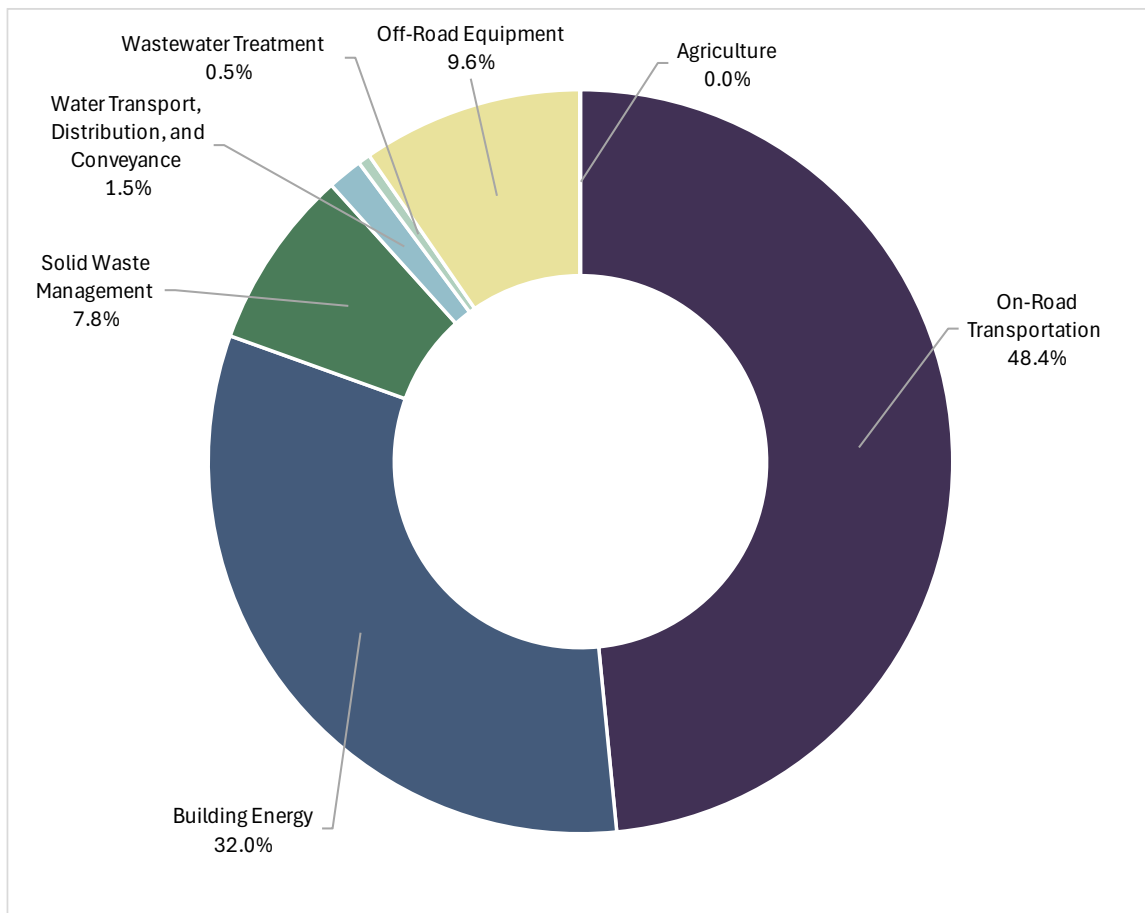


Figure A-5 shows each sector's contribution to Cathedral City's 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 48 percent, followed by building energy at about 32 percent, and off-road equipment at around 10 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-5 2023 Emissions by Sector – Cathedral City

Greenhouse Gas Forecast and Reduction Targets

Cathedral City is committed to supporting the state’s goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Cathedral City has set a 30 percent GHG reduction goal from 2023 levels by 2030 at a service population (SP) level (population + employment). In 2023, Cathedral City had a GHG emissions per service population level of 4.37 MTCO₂e. Aligned with the state’s goals, the City’s 2030 target is 3.05 MTCO₂e per service population, indicated in **Figure A-6** as the yellow diamond.

Figure A-6 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 27 percent and GHGs per SP (light green line) will decrease by 30 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 5 percent over that same time period. **Cathedral City is expected to meet its GHG per SP target by 2030.**

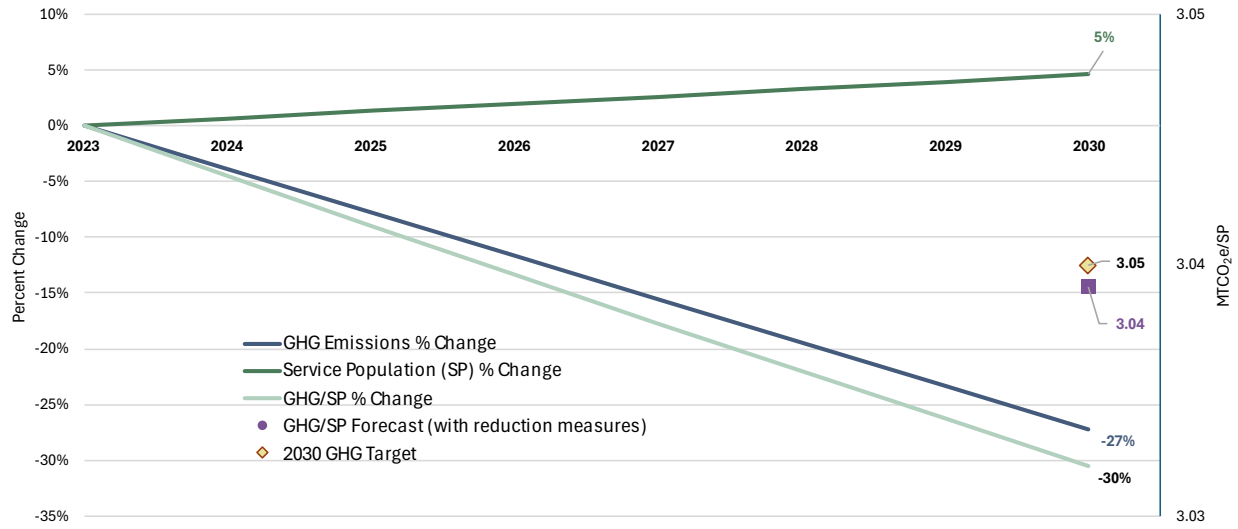
Figure A-6 Cathedral City 2030 GHG Reduction Target (MTCO₂e)

Table A-9 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Cathedral City will meet its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Sector	2023 Emissions (MTCO₂e)	2030 BAU (MTCO₂e)	2030 Reductions (MTCO₂e)	2030 Emissions with Reduction Plan (MTCO₂e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	163,450	169,915	41,077	128,837	21%
Building Energy	108,122	116,333	50,666	65,667	39%
Solid Waste Management	26,457	27,275	13,767	13,508	49%
Water Transport, Distribution, and Conveyance	5,131	5,292	1,989	3,304	36%
Wastewater Treatment	1,809	2,063	319	1,744	4%
Off-Road Equipment	32,899	35,325	2,769	32,556	1%
Agriculture	103	137	4	133	-29%
Total	337,969	356,341	110,591	245,750	-27%
GHG/SP Total	4.37			3.04	31%
GHG/SP Goal				3.05	
Goal Met?				Yes	

Table A-9 Emissions Reductions by Sector for Cathedral City					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
Goal Exceeded By				0.01	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Cathedral City in **Table A-10**.

Table A-10 Cathedral City GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	26,426	73,031
SB 350 Clean Energy and Pollution Reduction Act	18,128	4,972
Title 24 Building Energy Efficiency Standards	1,521	5,192
California Solar Mandate	3,035	-
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	2,769	8,799
Vehicle Efficiency Standards	27,270	52,409
Advanced Clean Cars II (ACCII)	12,358	87,521
Water		
Water Conservation Mandates	1,389	5,953
Wastewater		
Renewable Electricity in Wastewater Systems	319	825
Total Reduction from State Measures	93,216	238,702

Local Measures

This section highlights the Cathedral City's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-11** provides a list of local reduction measures that the city will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-11 Cathedral City 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	NQ	NQ
Energy-2	LED Bulbs and Fixtures	1,463	-
Energy-3	Smart Thermostat	NQ	NQ
Energy-4	Appliance Electrification Upgrades	72	-
Energy-5	Solar Window Film	NQ	NQ
Energy-6	Cool Roofs	22	-40
Energy-7	Roofline Insulation and Attic Encapsulation	NQ	NQ
Energy-8	HVAC Maintenance Program	NQ	NQ
Energy-9	Solar Installations for New Commercial and Industrial Development	NQ	NQ
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	NQ	NQ
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	NQ	NQ
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	1,449	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	1,275
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-

Table A-11 Cathedral City 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	-	2,270
Off-Road-2	Lawn and Garden Equipment Electrification	-	169
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	10,880	11,866
Waste-2	Construction and Demolition Waste Diversion	2,142	3,115
Waste-3	Solid Waste Diversion	460	2,007
Waste-4	Food Waste and Organics Diversion	284	310
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	585	-
Water-2	Water Conservation	14	-
Total Local Reductions Anticipated ^a		17,375	20,972
NOTES: NQ – Not quantified because this measure was not selected by the city. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, Cathedral City is expected to meet its 2030 GHG reduction target. **Table A-12** below summarizes Cathedral City's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions fall short of the established emissions targets.

Table A-12 Cathedral City's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
BAU Forecast	356,341	408,793
Total Reductions from State Measures	93,216	238,702
Total Reductions from Local Measures	17,375	20,972

Table A-12 Cathedral City's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
Resulting GHG Emissions/SP with CCAP Implementation ^a	3.04	1.66
GHG/SP Target	3.05	NQ
Target Exceeded By	0.01	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of Coachella



The City of Coachella is located in the eastern portion of the Coachella Valley in Riverside County, California. It is approximately 28 miles southeast of Palm Springs and 130 miles east of Los Angeles, with neighboring cities including Indio, La Quinta, and unincorporated Riverside County land to the north and south. Coachella is situated near the Coachella Valley Music and Arts Festival venue, a globally recognized event site.

Attractions near Coachella include the Empire Polo Club, the Augustine Casino, Spotlight 29 Casino, and the annual Coachella and Stagecoach Music Festivals. Coachella has a typical low-desert climate with summertime high temperatures above 100 degrees Fahrenheit (°F) and wintertime lows near 40°F.

Coachella spans 28 square miles, with significant portions designated for agriculture, residential, and commercial uses. These land uses influence the city's greenhouse gas (GHG) profile, with primary emissions sources being on-road transportation and energy consumption. Other land uses in the city include low- to medium-density residential areas and open space for agriculture. The city had a population of around 43,000 in 2023. However, Coachella's population was estimated to be 60,099 in 2023 by the Riverside County Model (RIVCOM), which is used for modeling purposes by the Southern California Association of Governments (SCAG).

Based on socioeconomic data provided by RIVCOM, the City's population is expected to grow approximately 39 percent from 2023 to 2030, and 123 percent from 2023 to 2045. Households are expected to grow 50 percent from 2023 to 2030 and 159 percent from 2023 to 2045, while employment is expected to grow 35 percent and 109 percent over those same time periods. However, it is important to note that these population projections were established in 2010 with reference to a development agreement that has since been delayed.

Table A-13 presents socioeconomic data for Coachella, including population, housing, and employment based on RIVCOM data.

Table A-13 Coachella Socioeconomic Data			
Category	2023	2030	2045
Population	60,099	83,636	134,070
Households	15,111	22,733	39,066
Jobs	11,458	15,441	23,977

Greenhouse Gas Inventory and Emissions Forecasts

The City of Coachella's Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City’s baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City’s future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under “business-as-usual” (BAU) conditions and under an “adjusted” forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-14 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-7** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-14 Coachella GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	170,716	233,037	366,582
<i>Light-Duty Vehicles</i>	<i>104,819</i>	<i>152,186</i>	<i>253,686</i>
<i>Heavy-Duty Vehicles</i>	<i>65,896</i>	<i>80,851</i>	<i>112,896</i>
Building Energy	109,975	152,390	244,428
<i>Residential Electricity</i>	<i>54,050</i>	<i>75,071</i>	<i>39,924</i>
<i>Residential Natural Gas</i>	<i>15,456</i>	<i>23,254</i>	<i>10,150</i>
<i>Non-Residential Electricity</i>	<i>35,619</i>	<i>47,529</i>	<i>120,842</i>
<i>Non-Residential Natural Gas</i>	<i>4,850</i>	<i>6,536</i>	<i>73,513</i>
Solid Waste Management	20,505	27,020	39,178
Water Transport, Distribution, and Treatment	1,151	3,286	2,567
Wastewater	2,135	1,602	5,268
Off-Road Equipment	15,478	18,043	23,530
Agriculture	135	180	202
TOTAL ^a	320,094	435,558	681,755
<i>Natural Working Lands and Forestry ^b</i>	<i>148,099</i>	<i>148,099</i>	<i>148,099</i>
NOTES:			
a. Totals may not sum due to rounding.			
b. Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

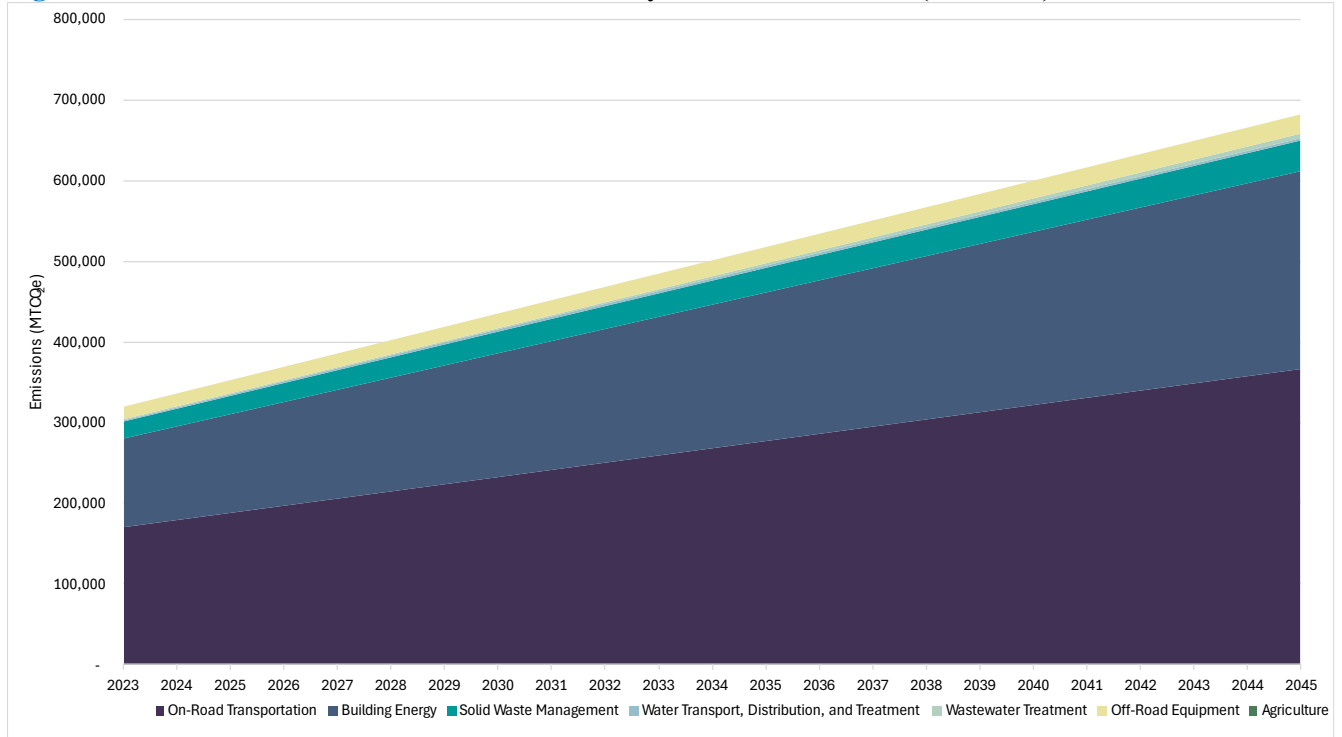
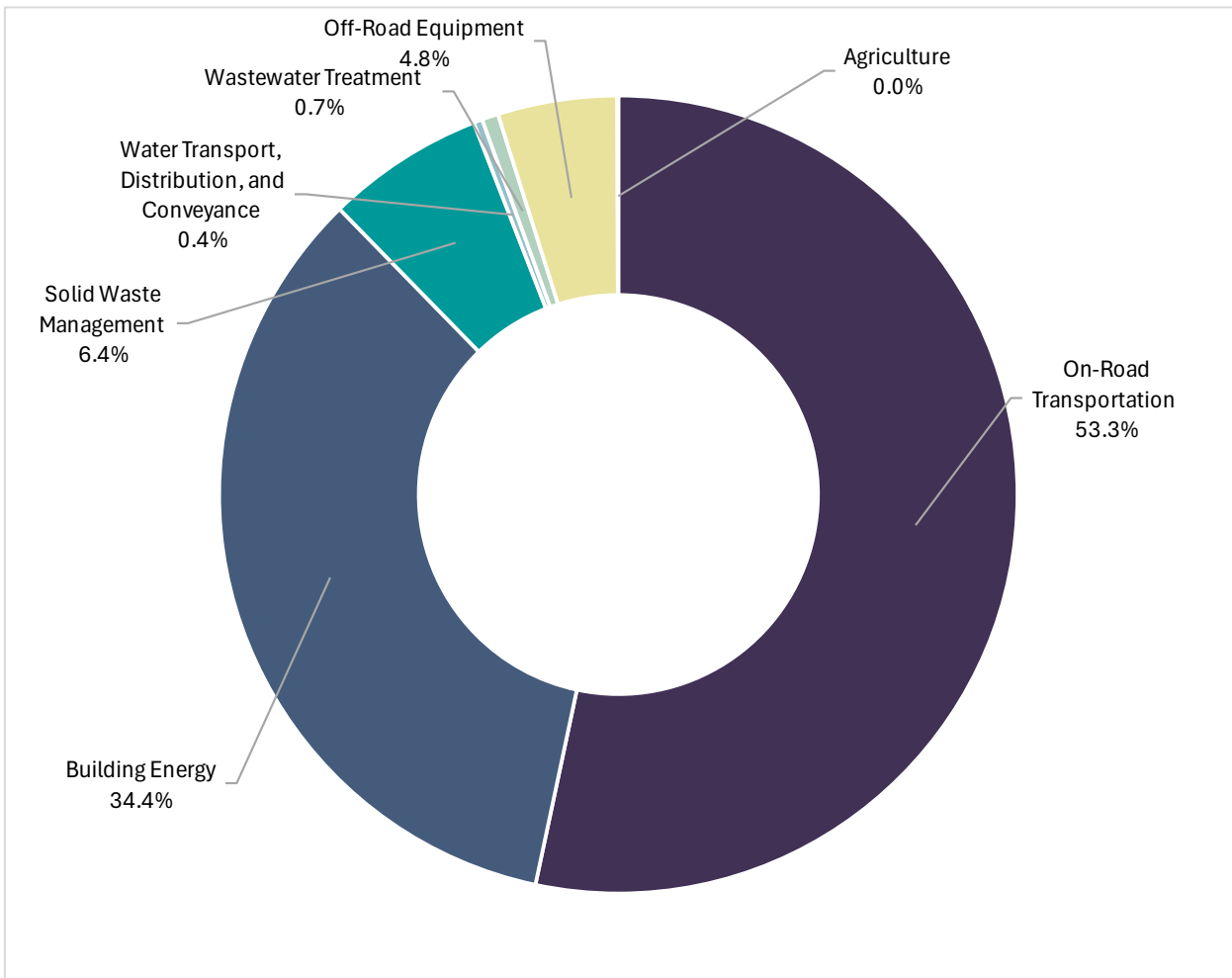
Figure A-7 Coachella GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

Figure A-8 shows each sector's contribution to the City of Coachella's 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 53 percent, followed by building energy at about 34 percent, and solid waste management at around 6 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-8 2023 Emissions by Sector – Coachella

Greenhouse Gas Forecast and Reduction Targets

Coachella is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. To achieve these goals, Coachella set a 7.0 MTCO₂e per service population (SP) in 2020 and a 4.2 MTCO₂e per SP in 2035. A 2030 target of 5.13 MTCO₂e per SP was interpolated based on the 2035 target and is aligned with the state's goals. This is indicated in **Figure A-9** as the yellow diamond.

Figure A-9 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 12 percent and GHGs per SP (light green line) will decrease by 36 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 38 percent over that same time period. **Coachella is expected to meet its GHG per SP target by 2030.**

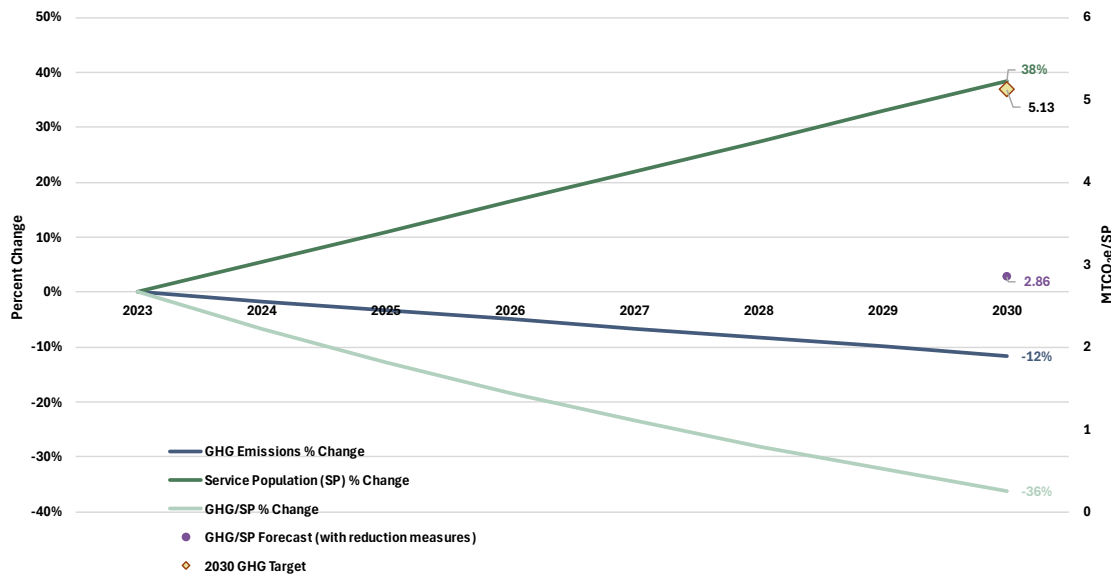
Figure A-9 Coachella 2030 GHG Reduction Target (MTCO₂e)

Table A-15 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Coachella exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Sector	2023 Emissions (MTCO₂e)	2030 BAU (MTCO₂e)	2030 Reductions (MTCO₂e)	2030 Emissions with Reduction Plan (MTCO₂e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	170,716	233,037	52,630	180,407	-16%
Building Energy	109,975	152,390	85,613	66,777	39%
Solid Waste Management	20,505	27,020	11,377	15,643	24%
Water Transport, Distribution, and Conveyance	1,151	3,286	484	2,802	-143%
Wastewater Treatment	2,135	1,602	508	1,093	49%
Off-Road Equipment	15,478	18,043	1,785	16,258	-5%
Agriculture	135	180	4	176	-30%
Total	320,094	435,558	152,401	283,157	6%
GHG/SP Total	4.47			2.86	
GHG/SP Goal				5.13	
Goal Met?				Yes	

Table A-15 Emissions Reductions by Sector for Coachella					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
<i>Goal Exceeded by</i>				2.27	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Coachella in **Table A-16**.

Table A-16 Coachella GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	54,176	192,251
SB 350 Clean Energy and Pollution Reduction Act	14,100	8,959
Title 24 Building Energy Efficiency Standards	8,959	7,246
California Solar Mandate	5,963	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	1,785	4,416
Vehicle Efficiency Standards	36,810	99,433
Advanced Clean Cars II (ACCI)	14,350	144,752
Water		
Water Conservation Mandates	484	2,567
Wastewater		
Renewable Electricity in Wastewater Systems	508	1,873
Total Reduction from State Measures	137,136	461,495

Local Measures

This section highlights the City of Coachella's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-17** provides a list of local reduction measures that the City will undertake and the anticipated reductions expected by 2030 and 2045.

Table A-17 Coachella's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	NQ	NQ
Energy-2	LED Bulbs and Fixtures	NQ	NQ
Energy-3	Smart Thermostat	NQ	NQ
Energy-4	Appliance Electrification Upgrades	NQ	NQ
Energy-5	Solar Window Film	NQ	NQ
Energy-6	Cool Roofs	NQ	NQ
Energy-7	Roofline Insulation and Attic Encapsulation	NQ	NQ
Energy-8	HVAC Maintenance Program	NQ	NQ
Energy-9	Solar Installations for New Commercial and Industrial Development	NQ	NQ
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	2,414	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	NQ	NQ
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	1,470	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	2,567
On-Road-7	Increase Transit Service and Frequency	-	-

Table A-17 Coachella's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	NQ	NQ
Off-Road-2	Lawn and Garden Equipment Electrification	NQ	NQ
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	11,377	18,237
Waste-2	Construction and Demolition Waste Diversion	NQ	NQ
Waste-3	Solid Waste Diversion	NQ	NQ
Waste-4	Food Waste and Organics Diversion	NQ	NQ
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	NQ	NQ
Water-2	Water Conservation	NQ	NQ
Total Local Reductions Anticipated ^c		15,265	20,805
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Coachella is expected to exceed its GHG/SP reduction target by 2.27 MTCO_{2e} by 2030. **Table A-18** below summarizes Coachella's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-18 Coachella's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO _{2e})		
	2030	2045
BAU Forecast	435,558	681,755
Total Reductions from State Measures	137,136	461,495
Total Reductions from Local Measures	15,265	20,805

Resulting GHG Emissions/SP with CCAP Implementation ^a	2.86	1.26
GHG/SP Target	5.13	NQ
Target Exceeded By	2.27	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of Desert Hot Springs



The City of Desert Hot Springs is located in the western Coachella Valley in Riverside County, California. It is approximately 12 miles north of Palm Springs and 120 miles east of Los Angeles, accessible via Interstate 10.

Desert Hot Springs is part of the Southern California Association of Governments (SCAG) Regional Council District 2, which includes Cathedral City, Indian Wells, Palm Desert, Palm Springs, and Rancho Mirage.

Attractions near Desert Hot Springs include the Cabot's Pueblo Museum and natural mineral hot springs, known for their healing properties. Desert Hot Springs has a typical desert climate with summertime high temperatures above 100 degrees Fahrenheit (°F) and wintertime lows near 40°F.

Desert Hot Springs spans 31 square miles, with significant portions designated for residential, open space, and commercial uses. These land uses influence the city's greenhouse gas (GHG) profile, with primary emissions sources being on-road transportation, residential energy consumption, and industrial processes. The city had a population of 32,654 as of 2023.

Based on socioeconomic data provided by the California's Department of Finance (DOF), the City's population is expected to grow approximately 7 percent from 2023 to 2030, and 29 percent from 2023 to 2045. Households are expected to grow 25 percent from 2023 to 2030 and 65 percent from 2023 to 2045, while employment is expected to grow 17 percent and 54 percent over those same time periods.

Table A-19 presents socioeconomic data for Desert Hot Springs, including population, housing, and employment (DOF).

Table A-19 Desert Hot Springs Socioeconomic Data			
Category	2023	2030	2045
Population	32,654	35,024	42,057
Households	12,006	15,012	19,770
Jobs	11,600	13,591	17,854

Greenhouse Gas Inventory and Emissions Forecasts

The City of Desert Hot Springs Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU)

conditions and under an “adjusted” forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-20 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-10** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-20 Desert Hot Springs GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	97,809	107,417	145,847
<i>Light-Duty Vehicles</i>	<i>79,920</i>	<i>88,081</i>	<i>120,721</i>
<i>Heavy-Duty Vehicles</i>	<i>17,889</i>	<i>19,337</i>	<i>25,125</i>
Building Energy	61,859	72,289	93,196
<i>Residential Electricity</i>	<i>16,875</i>	<i>18,060</i>	<i>21,808</i>
<i>Residential Natural Gas</i>	<i>17,675</i>	<i>22,101</i>	<i>29,095</i>
<i>Non-Residential Electricity</i>	<i>22,349</i>	<i>26,317</i>	<i>34,660</i>
<i>Non-Residential Natural Gas</i>	<i>4,959</i>	<i>5,811</i>	<i>7,633</i>
Solid Waste Management	17,815	19,056	23,791
Water Transport, Distribution, and Treatment	1,582	1,697	2,185
Wastewater	1,160	1,376	1,772
Off-Road Equipment	12,435	14,569	22,638
Agriculture	115	153	172
TOTAL ^a	192,463	216,557	289,601
<i>Natural Working Lands and Forestry ^b</i>	<i>222,892</i>	<i>222,892</i>	<i>222,892</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-10 Desert Hot Springs GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

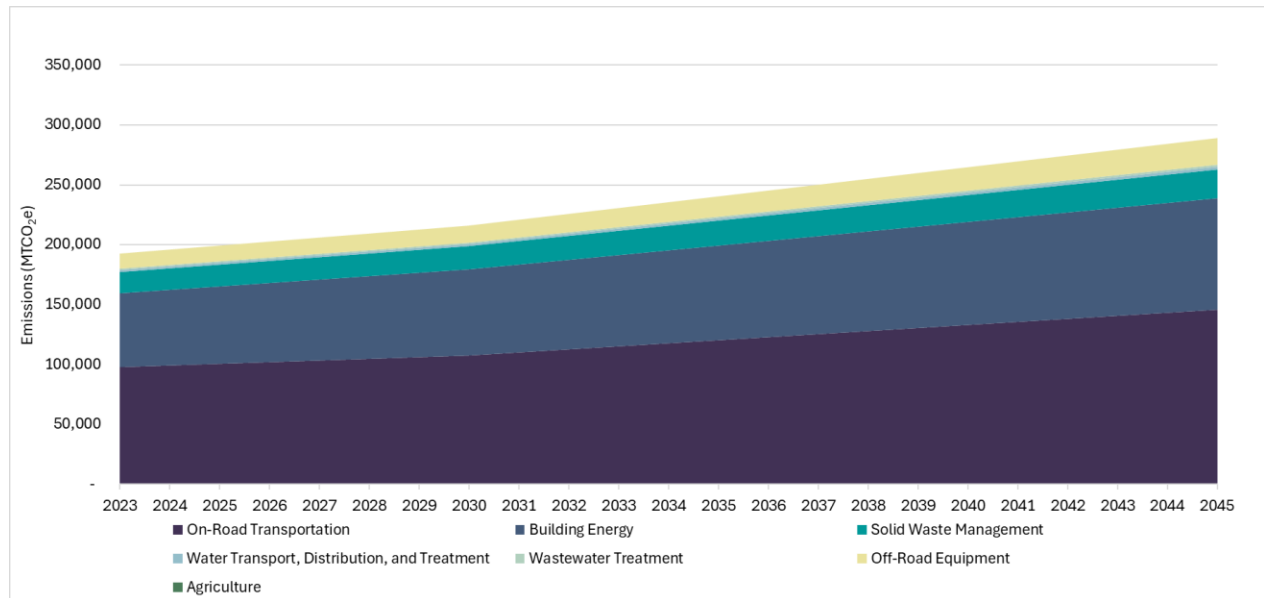
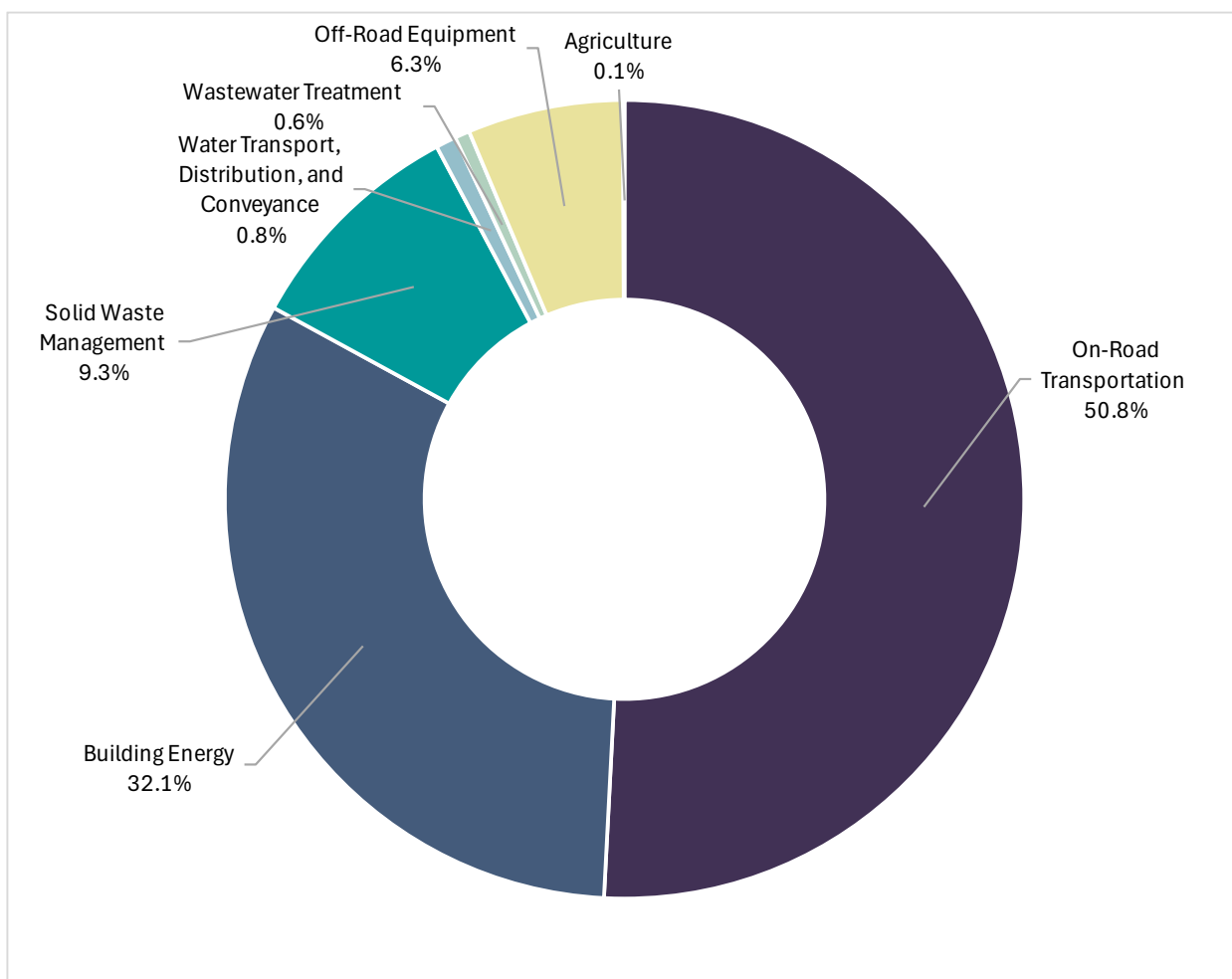


Figure A-11 shows each sector's contribution to the City of Desert Hot Springs' 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 51 percent, followed by building energy at about 32 percent, and solid waste management at around 9 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-11 2023 Emissions by Sector – Desert Hot Springs

Greenhouse Gas Forecast and Reduction Targets

Desert Hot Springs is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Desert Hot Springs has set a 30 percent GHG reduction goal from 2023 levels by 2030 at a service population (SP) level (population + employment). In 2023, Desert Hot Springs had a GHG emissions per service population level of 4.36. Aligned with the state's goals, the City's 2030 target is 3.04 MTCO₂e per service population, indicated in **Figure A-12** as the yellow diamond.

Figure A-12 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 26 percent and GHGs per SP (light green line) will decrease by 32 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 10 percent over that same time period. **Desert Hot Springs is expected to meet its GHG per SP target by 2030** and would exceed the goal by 0.09 MTCO₂e per SP.

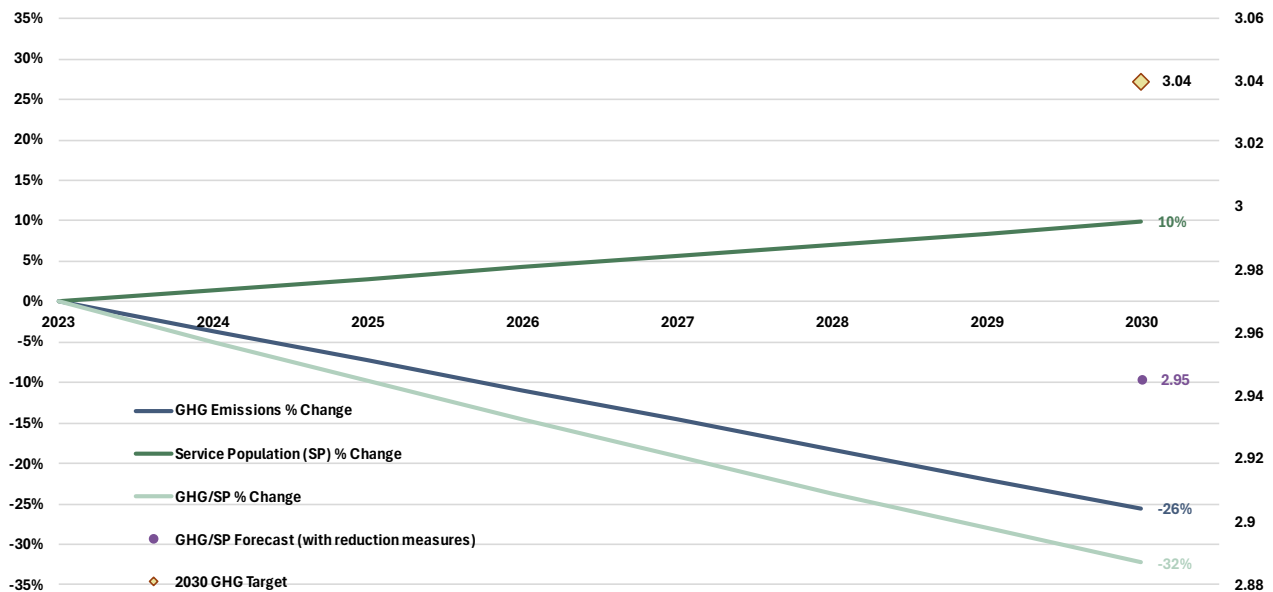
Figure A-12 Desert Hot Springs 2030 GHG Reduction Target (MTCO₂e)

Table A-21 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Desert Hot Springs exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Sector	2023 Emissions (MTCO₂e)	2030 BAU (MTCO₂e)	2030 Reductions (MTCO₂e)	2030 Emissions with Reduction Plan (MTCO₂e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	97,809	107,417	26,618	80,799	17%
Building Energy	61,859	72,289	35,020	37,269	40%
Solid Waste Management	17,815	19,056	9,639	9,417	47%
Water Transport, Distribution, and Conveyance	1,582	1,697	385	1,312	17%
Wastewater Treatment	1,160	1,376	213	1,163	0%
Off-Road Equipment	12,435	14,569	1,489	13,080	-5%
Agriculture	115	153	4	149	-30%
Total	192,463	216,557	73,368	143,189	26%
GHG/SP Total	4.35			2.95	32%
GHG/SP Goal				3.04	
Goal Met?				Yes	

Table A-21 Emissions Reductions by Sector for Desert Hot Springs					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
<i>Goal Exceeded by</i>				0.09	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Desert Hot Springs in **Table A-22**.

Table A-22 Desert Hot Springs GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	19,020	59,888
SB 350 Clean Energy and Pollution Reduction Act	9,301	1,562
Title 24 Building Energy Efficiency Standards	1,936	5,217
California Solar Mandate	2,348	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	1,142	4,576
Vehicle Efficiency Standards	17,352	39,382
Advanced Clean Cars II (ACCI)	8,305	68,883
Water		
Water Conservation Mandates	385	2,185
Wastewater		
Renewable Electricity in Wastewater Systems	213	630
Total Reduction from State Measures	60,002	182,322

Local Measures

This section highlights the City of Desert Hot Springs' current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-23** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-23 Desert Hot Springs' 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	NQ	NQ
Energy-2	LED Bulbs and Fixtures	NQ	NQ
Energy-3	Smart Thermostat	NQ	NQ
Energy-4	Appliance Electrification Upgrades	NQ	NQ
Energy-5	Solar Window Film	NQ	NQ
Energy-6	Cool Roofs	15	-26
Energy-7	Roofline Insulation and Attic Encapsulation	NQ	NQ
Energy-8	HVAC Maintenance Program	265	519
Energy-9	Solar Installations for New Commercial and Industrial Development	NQ	NQ
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	2,134	-
Energy-11	Solar Installations for Existing Homes	NQ	NQ
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	NQ	NQ
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	961	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	963
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-

Table A-23 Desert Hot Springs' 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	225	1,180
Off-Road-2	Lawn and Garden Equipment Electrification	122	88
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	7,618	9,148
Waste-2	Construction and Demolition Waste Diversion	1,500	2,401
Waste-3	Solid Waste Diversion	322	1,647
Waste-4	Food Waste and Organics Diversion	199	239
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	NQ	NQ
Water-2	Water Conservation	NQ	NQ
Total Local Reductions Anticipated ^c		13,366	17,059
NOTES: NQ – Not quantified because this measure was not selected by the City. a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9 c – Totals may not add up due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Desert Hot Springs is expected to exceed its GHG/SP reduction target by 2.06 MTCO₂e by 2030. **Table A-24** below summarizes Desert Hot Springs' projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-24 Desert Hot Springs' Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
BAU Forecast	216,557	289,601
Total Reductions from State Measures	60,002	182,322
Total Reductions from Local Measures	13,366	16,059
Resulting GHG Emissions/SP with CCAP Implementation ^a	2.95	1.52
GHG/SP Target	3.04	NQ
Target Exceeded By	0.09	NQ

Table A-24		
Desert Hot Springs' Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
<i>NOTES:</i> a - Totals may not sum due to rounding. NQ – not quantified (-) – Dashes indicate 0/no data		

City of Indian Wells

Indian Wells is an internationally-renowned desert resort city located in the Coachella Valley in Riverside County.



Incorporated in 1967, Indian Wells experienced rapid transformation from its humble beginnings into a residential and vacation destination through a boom in development of golf courses, country clubs, and resort hotels. Today, Indian Wells is recognized as a city where residents live in a content, tranquil, and happy environment with an exceptional quality of life.

Indian Wells is best known for its world class resorts, catering to golf and tennis enthusiasts, and quality residential lifestyle. The city is also home to the prestigious BNP Paribas Open; a major annual tennis tournament held at the Indian Wells Tennis Gardens. Residents of the City enjoy an ideal climate, with over 330 days of sunshine each year. The City's beautiful surroundings include views of the Santa Rosa and San Jacinto Mountains. Looking forward, the City will continue to reinforce and refine its established vision as it plans for a prosperous and sustainable future.

Based on socioeconomic data provided by the California Department of Finance (DOF), the City's population is expected to grow approximately 2 percent from 2023 to 2030, and 7 percent from 2023 to 2045. Households are expected to grow 4 percent from 2023 to 2030 and 11 percent from 2023 to 2045, while employment is expected to grow 5 percent and 16 percent over those same time periods.

Table A-25 presents socioeconomic data for Indian Wells, including population, housing, and employment (DOF).

Table A-25 Indian Wells Socioeconomic Data			
Category	2023	2030	2045
Population	4,797	4,879	5,124
Households	5,335	5,568	5,936
Jobs	1,700	1,789	1,980

Greenhouse Gas Inventory and Emissions Forecasts

The City of Indian Wells Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions and under an "adjusted" forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-26 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045.

Figure A-13 provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-26			
Indian Wells GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	22,010	22,286	23,253
<i>Light-Duty Vehicles</i>	<i>15,289</i>	<i>15,587</i>	<i>16,641</i>
<i>Heavy-Duty Vehicles</i>	<i>6,721</i>	<i>6,699</i>	<i>6,612</i>
Building Energy	59,221	61,723	66,307
<i>Residential Electricity</i>	<i>15,043</i>	<i>15,315</i>	<i>16,168</i>
<i>Residential Natural Gas</i>	<i>25,681</i>	<i>26,939</i>	<i>28,564</i>
<i>Non-Residential Electricity</i>	<i>11,978</i>	<i>12,608</i>	<i>13,983</i>
<i>Non-Residential Natural Gas</i>	<i>6,519</i>	<i>6,861</i>	<i>7,593</i>
Solid Waste Management	6,253	6,359	6,777
Water Transport, Distribution, and Treatment	493	501	536
Wastewater	170	192	205
Off-Road Equipment	917	965	973
Agriculture	66	88	98
TOTAL ^a	89,129	92,113	98,148
<i>Natural Working Lands and Forestry ^b</i>	<i>22,010</i>	<i>22,286</i>	<i>23,253</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-13 Indian Wells GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

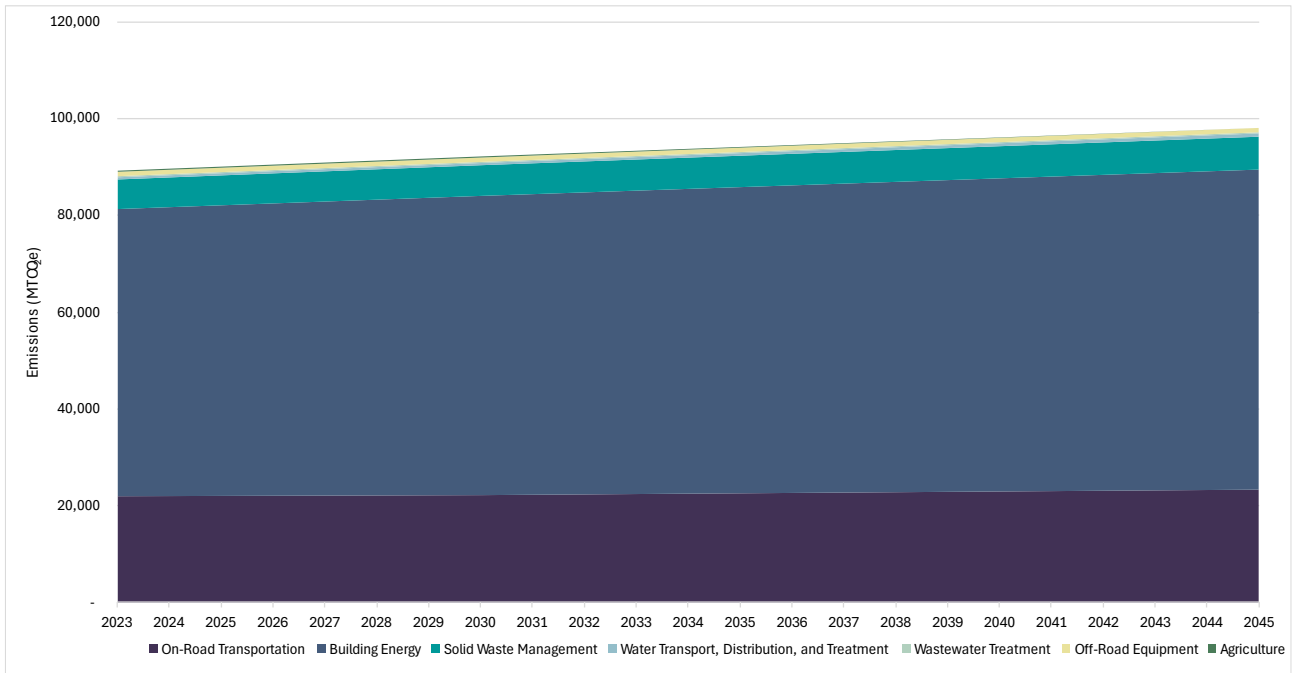
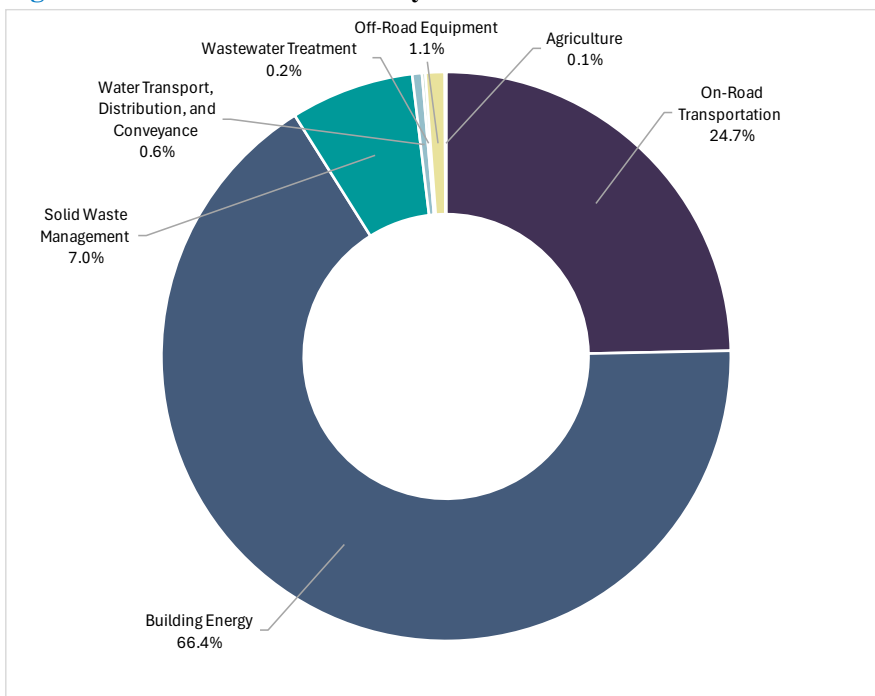


Figure A-14 shows each sector's contribution to the City of Indian Wells' 2023 inventory, indicating that building energy is the greatest contributor to total emissions, at 66 percent, followed by on road transportation at about 25 percent, and solid waste management at around 7 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-14 2023 Emissions by Sector – Indian Wells



Greenhouse Gas Forecast and Reduction Targets

Indian Wells is committed to supporting the state’s goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Indian Wells has set a 30 percent GHG reduction goal from 2023 levels by 2030 at a service population (SP) level (population + employment). In 2023, Indian Wells had a GHG emissions per service population level of 13.72. Aligned with the state’s goals, the City’s 2030 target is 9.56 MTCO₂e per service population, indicated in **Figure A-15** as the yellow diamond.

Figure A-15 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 29 percent and GHGs per SP (light green line) will decrease by 31 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 3 percent over that same time period. **Indian Wells is expected to meet its GHG per SP target by 2030** and would exceed the goal by 0.12 MTCO₂e per SP.

Figure A-15 Indian Wells 2030 GHG Reduction Target (MTCO₂e)

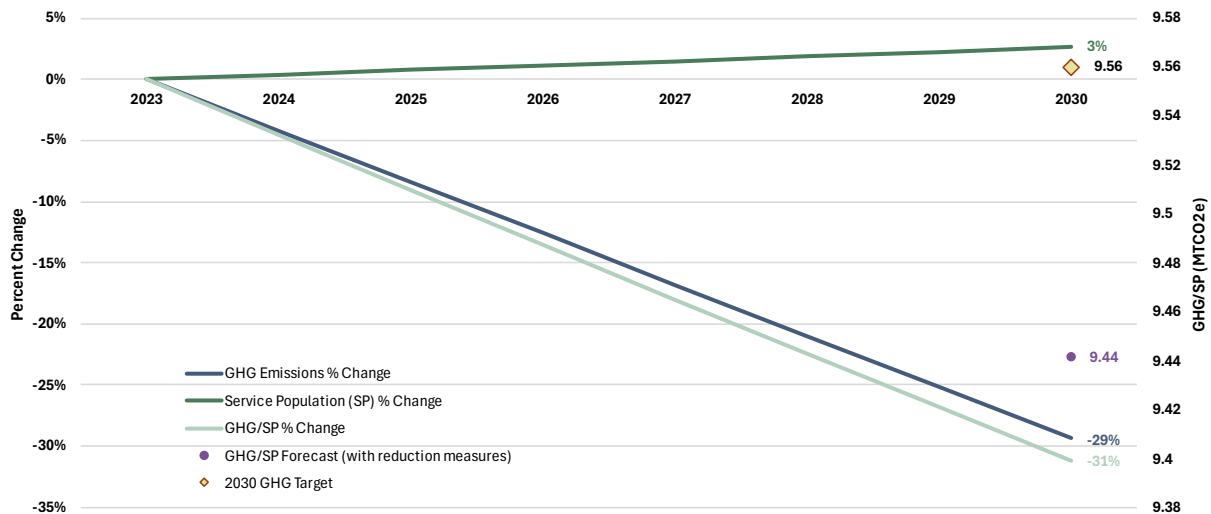


Table A-27 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Indian Wells exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Table A-27
Emissions Reductions by Sector for Indian Wells

Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	22,010	22,286	5,375	16,911	23%
Building Energy	59,221	61,723	20,874	40,849	31%
Solid Waste Management	6,253	6,359	2,536	3,824	39%
Water Transport, Distribution, and Conveyance	493	501	189	312	37%
Wastewater Treatment	170	192	39	152	11%
Off-Road Equipment	917	965	131	833	9%
Agriculture	66	88	4	84	-27%
Total	89,129	92,113	29,148	62,965	29%
GHG/SP Total	13.72			9.44	31%
GHG/SP Goal				9.56	
Goal Met?				Yes	
Goal Exceeded by				<i>0.12</i>	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Indian Wells in **Table A-28**.

Table A-28
Indian Wells GHG Reductions from State Measures (MTCO₂e/yr)

State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	11,581	30,673
SB 350 Clean Energy and Pollution Reduction Act	1,116	0
Title 24 Building Energy Efficiency Standards	463	1,536
California Solar Mandate	1,178	0
Transportation		

Table A-28 Indian Wells GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	76	197
Vehicle Efficiency Standards	3,542	6,302
Advanced Clean Cars II (ACCII)	1,470	9,495
Water		
Water Conservation Mandates	133	0
Wastewater		
Renewable Electricity in Wastewater Systems	30	0
Total Reduction from State Measures	19,588	48,203

Local Measures

This section highlights the City of Indian Wells' current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-29** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-29 Indian Wells' 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	4,239	8,117
Energy-2	LED Bulbs and Fixtures	811	-
Energy-3	Smart Thermostat	158	7
Energy-4	Appliance Electrification Upgrades	59	-
Energy-5	Solar Window Film	61	-
Energy-6	Cool Roofs	4	-10
Energy-7	Roofline Insulation and Attic Encapsulation	125	241
Energy-8	HVAC Maintenance Program	259	429
Energy-9	Solar Installations for New Commercial and Industrial Development	NQ	NQ
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	819	

Table A-29 Indian Wells' 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	NQ	NQ
On Road Transportation			
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	363	100
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	45	51
Off-Road-2	Lawn and Garden Equipment Electrification	11	4
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	2,536	2,663
Waste-2	Construction and Demolition Waste Diversion	NQ	NQ
Waste-3	Solid Waste Diversion	NQ	NQ
Waste-4	Food Waste and Organics Diversion	NQ	NQ
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	10	-
Water-1	Increase Recycled Water Use	55	-
Water-2	Water Conservation	1	-
Total Local Reductions Anticipated ^c		9,561	11,601
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Indian Wells is expected to meet its GHG/SP reduction target with an additional reduction of 0.12 MTCO₂e per SP by 2030. **Table A-30** below summarizes Indian Wells' projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local

and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-30		
Indian Wells' Anticipated 2030 and 2045 GHG Reduction Summary (MTCO₂e)		
	2030	2045
BAU Forecast	92,113	98,148
Total Reductions from State Measures	19,588	48,203
Total Reductions from Local Measures	9,561	11,601
Resulting GHG Emissions/SP with CCAP Implementation ^a	9.44	5.40
GHG/SP Target	9.56	NQ
Target Exceeded By	0.12	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of Indio

Located in the Coachella Valley, the City of Indio spans 30 square miles and is the largest municipality in the Valley, both in area and in population. It is the fastest growing city in the Valley, with over 100,000 residents. Indio is bordered by the City of La Quinta to the west, the City of Coachella to the east, and unincorporated Riverside County land to the north and south. Indio has a hot desert climate with hot summers and mild winters and receives approximately 3 inches of rain annually (City of Indio, 2025).



The City of Indio is widely recognized as a cultural, musical, sports, entertainment, and culinary events destination and receives nearly 1.4 million visitors annually. Indio is continuing to grow as a tourism destination and is actively looking to bolster its tourism and hospitality sector while diversifying its economy. Indio has one of the younger populations in the Coachella Valley and is expected to experience an influx of Millennials. Although the region has been encouraging alternative modes of transportation, most residents in the City value the use of their car for primary transportation and using vehicles in Indio is still a priority.

Based on socioeconomic data provided by the Southern California Association of Governments (SCAG) through the Riverside County Model (RIVCOM), the City's population is expected to grow approximately 10 percent from 2023 to 2030, and 33 percent from 2023 to 2045. Households are expected to grow 15 percent from 2023 to 2030 and 48 percent from 2023 to 2045, while employment is expected to grow 11 percent and 36 percent over those same time periods. **Table A-31** below details socioeconomic data and growth projections for Indio, including population, housing, and employment (City of Indio, 2019).

Table A-31 Indio Socioeconomic Data			
Category	2023	2030	2045
Population	94,641	104,482	125,570
Households	29,566	34,047	43,649
Jobs	28,814	32,087	39,103

Greenhouse Gas Inventory and Emissions Forecasts

The City of Indio Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions and under an "adjusted" forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-32 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-16** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-32 Indio GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	314,092	334,519	378,290
<i>Light-Duty Vehicles</i>	<i>190,759</i>	<i>211,104</i>	<i>254,700</i>
<i>Heavy-Duty Vehicles</i>	<i>123,333</i>	<i>123,415</i>	<i>123,590</i>
Building Energy	252,083	281,283	345,917
<i>Residential Electricity</i>	<i>117,651</i>	<i>129,631</i>	<i>89,385</i>
<i>Residential Natural Gas</i>	<i>60,561</i>	<i>69,737</i>	<i>27,710</i>
<i>Non-Residential Electricity</i>	<i>53,453</i>	<i>59,177</i>	<i>156,567</i>
<i>Non-Residential Natural Gas</i>	<i>20,419</i>	<i>22,738</i>	<i>72,255</i>
Solid Waste Management	60,787	66,749	78,882
Water Transport, Distribution, and Treatment	2,831	4,105	3,756
Wastewater	3,362	3,125	4,934
Off-Road Equipment	24,944	27,372	32,571
Agriculture	150	200	224
TOTAL ^a	658,250	717,353	844,573
<i>Natural Working Lands and Forestry ^b</i>	<i>89,787</i>	<i>89,787</i>	<i>89,787</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

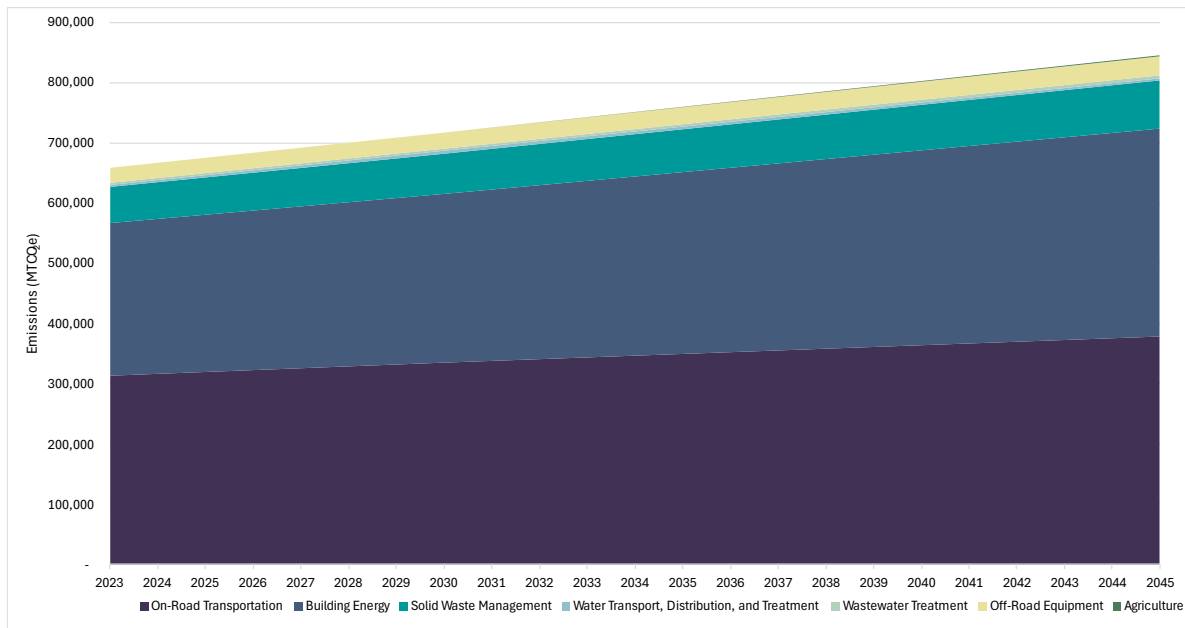
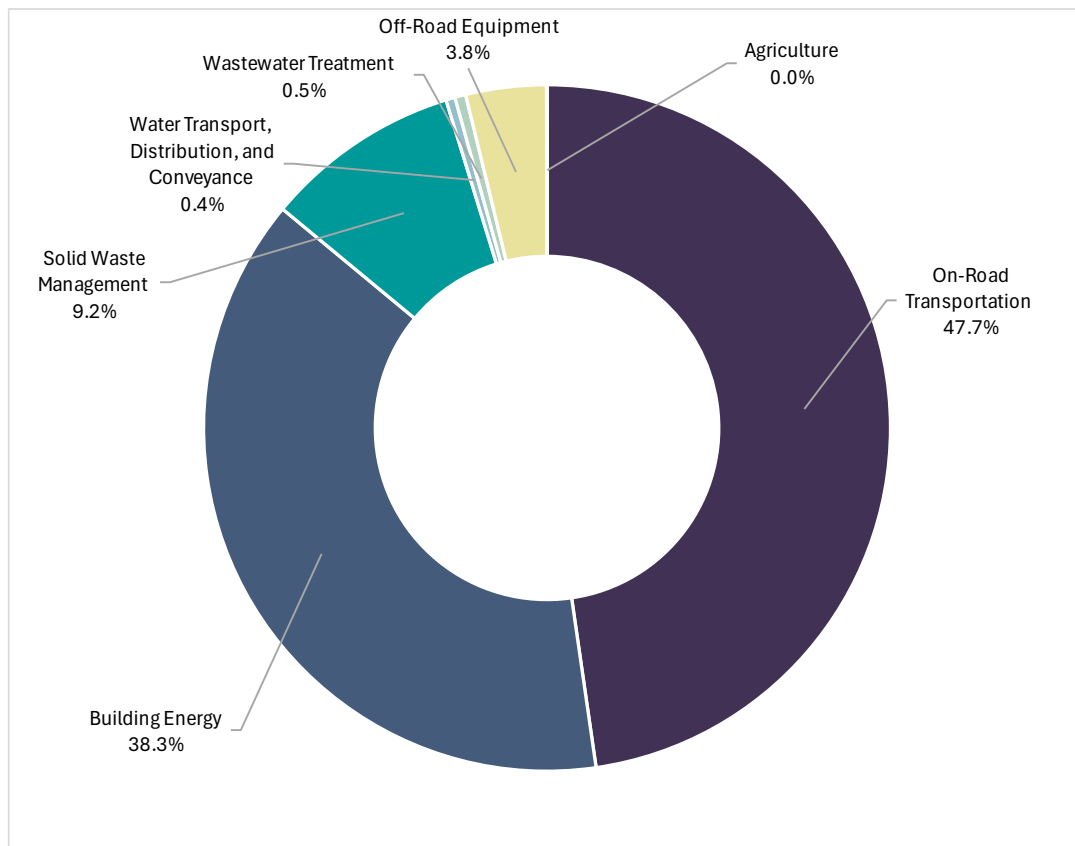
Figure A-16 Indio GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

Figure A-17 shows each sector's contribution to the City of Indio's 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 48 percent, followed by building energy at about 38 percent, and solid waste management at around 9 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-17 2023 Emissions by Sector – Indio

Greenhouse Gas Forecast and Reduction Targets

Indio is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In 2023, Indio had a GHG emissions per service population (GHG/SP) level of 5.33. Aligned with the state's goals, the City's 2030 target is 4.20 MTCO₂e per service population, indicated in **Figure A-18** as the yellow diamond.

Figure A-18 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 32 percent and GHGs per SP (light green line) will decrease by 39 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 11 percent over that same time period. **Indio is expected to meet its GHG per SP target by 2030** and would exceed the goal by 0.92 MTCO₂e per SP.

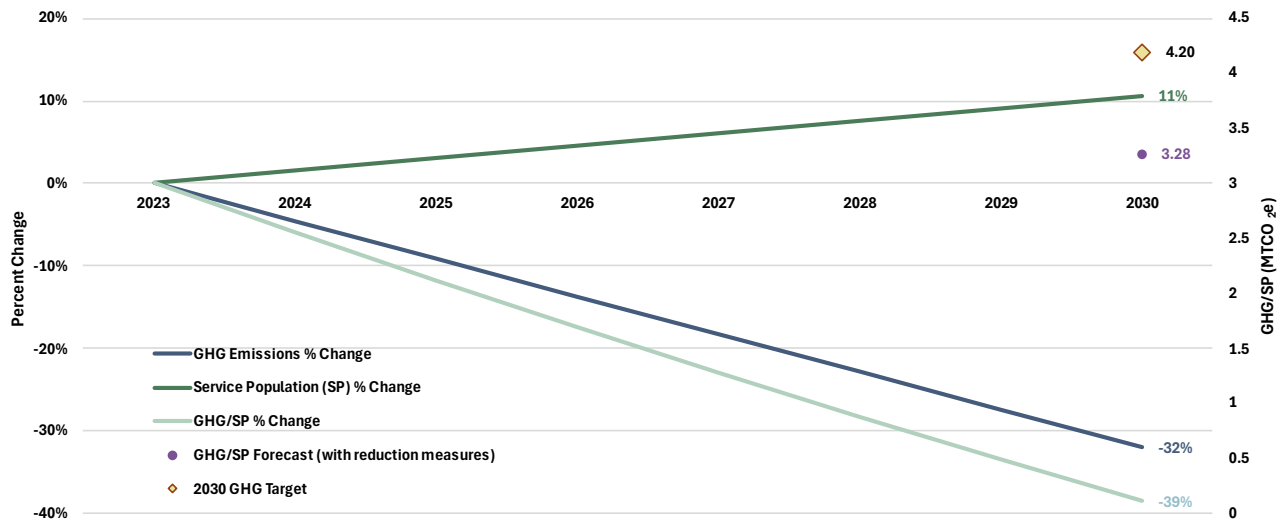
Figure A-18 Indio 2030 GHG Reduction Target (MTCO₂e)

Table A-33 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Indio exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include on-road transportation, building energy, and solid waste management.

Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	314,092	334,519	74,039	260,479	17%
Building Energy	252,083	281,283	157,282	124,001	51%
Solid Waste Management	60,787	66,749	33,854	32,896	46%
Water Transport, Distribution, and Conveyance	2,831	4,105	1,280	2,825	0%
Wastewater Treatment	3,362	3,125	841	2,284	32%
Off-Road Equipment	24,944	27,372	2,708	24,664	1%
Agriculture	150	200	4	196	-30%
Total	658,250	717,353	270,007	447,345	32%
GHG/SP Total	5.33			3.28	
GHG/SP Goal				4.20	
Goal Met?				Yes	
Goal Exceeded by				0.92	

Table A-33 Emissions Reductions by Sector for Indio					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Indio in **Table A-34**.

Table A-34 Indio GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	85,033	227,263
SB 350 Clean Energy and Pollution Reduction Act	31,358	11,394
Title 24 Building Energy Efficiency Standards	5,854	8,860
California Solar Mandate	3,451	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	2,708	6,112
Vehicle Efficiency Standards	52,681	102,672
Advanced Clean Cars II (ACCII)	19,905	145,330
Water		
Water Conservation Mandates	945	3,756
Wastewater		
Renewable Electricity in Wastewater Systems	635	1,754
Total Reduction from State Measures	202,570	507,141

Local Measures

This section highlights the City of Indio's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-35** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-35
Indio's 2030 and 2045 GHG Reduction Potential by Measure

Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	14,606	36,832
Energy-2	LED Bulbs and Fixtures	4,380	-
Energy-3	Smart Thermostat	392	23
Energy-4	Appliance Electrification Upgrades	232	-
Energy-5	Solar Window Film	357	-
Energy-6	Cool Roofs	31	-62
Energy-7	Roofline Insulation and Attic Encapsulation	331	623
Energy-8	HVAC Maintenance Program	833	1,275
Energy-9	Solar Installations for New Commercial and Industrial Development	368	-
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	1,812	-
Energy-11	Solar Installations for Existing Homes	4,648	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	3,596	-
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	1,453	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	3,756
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	NQ	NQ
Off-Road-2	Lawn and Garden Equipment Electrification	NQ	NQ
Solid Waste			

Table A-35 Indio's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Waste-1	SB 1383 Organic Waste Recycling	26,755	32,156
Waste-2	Construction and Demolition Waste Diversion	5,268	8,441
Waste-3	Solid Waste Diversion	1,131	5,439
Waste-4	Food Waste and Organics Diversion	699	840
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	206	0
Water-1	Increase Recycled Water Use	327	0
Water-2	Water Conservation	8	0
Total Local Reductions Anticipated ^c		67,483	89,111
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Indio is expected to exceed its GHG/SP reduction target by 0.92 MTCO_{2e} by 2030. **Table A-36** below summarizes Indio's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-36 Indio's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO _{2e})		
	2030	2045
BAU Forecast	717,353	844,573
Total Reductions from State Measures	202,570	507,141
Total Reductions from Local Measures	67,438	89,111
Resulting GHG Emissions/SP with CCAP Implementation ^a	3.28	1.51
GHG/SP Target	4.20	NQ
Target Exceeded By	0.92	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of La Quinta



The City of La Quinta is surrounded by the Santa Rosa Mountains and spans 32 square miles across the floor of the Coachella Valley. It is located between Indian Wells and Indio and has a population of about 41,299 full time residents as of 2023 (RIVCOM). The city also houses just over 12,000 part time residents who reside in the city during the winter and spring seasons. Similar to other Coachella Valley cities, La Quinta has a desert climate with hot summers and mild winters, experiencing over 300 days of sunshine, on average, per year (City of La Quinta, 2025).

Even with a smaller population, the city remains a hotspot for tourism. The City of La Quinta has evolved from a small residential suburb to a community that has a broad range of housing for permanent and seasonal residents. La Quinta has historically had three dominant economic sectors: resort hotels, golf, and commercial retail, also known for its vibrant arts and culture. With people flooding to the Coachella Valley every year, La Quinta experiences a significant influx of visitors during peak seasons.

Based on socioeconomic data provided by the Southern California Association of Governments (SCAG) through the Riverside County Model (RIVCOM), the City's population is expected to grow approximately 5 percent from 2023 to 2030, and 15 percent from 2023 to 2045. Households are expected to grow 7 percent from 2023 to 2030 and 21 percent from 2023 to 2045, while employment is expected to grow 3 percent and 10 percent over those same time periods.

Table A-37 below details socioeconomic data and growth projections for La Quinta, including population, housing, and employment (RIVCOM).

Table A-37 La Quinta Socioeconomic Data			
Category	2023	2030	2045
Population	41,299	43,292	47,564
Households	16,151	17,234	19,554
Jobs	17,042	17,576	18,720

Greenhouse Gas Inventory and Emissions Forecasts

The City of La Quinta Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU)

conditions and under an “adjusted” forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-38 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-19** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-38 La Quinta GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	149,217	149,548	150,258
<i>Light-Duty Vehicles</i>	<i>102,410</i>	<i>106,031</i>	<i>113,790</i>
<i>Heavy-Duty Vehicles</i>	<i>46,807</i>	<i>43,516</i>	<i>36,467</i>
Building Energy	193,619	202,512	222,558
<i>Residential Electricity</i>	<i>62,982</i>	<i>65,893</i>	<i>73,293</i>
<i>Residential Natural Gas</i>	<i>60,544</i>	<i>64,603</i>	<i>15,207</i>
<i>Non-Residential Electricity</i>	<i>56,249</i>	<i>57,738</i>	<i>72,754</i>
<i>Non-Residential Natural Gas</i>	<i>13,844</i>	<i>14,278</i>	<i>61,304</i>
Solid Waste Management	22,266	23,311	25,495
Water Transport, Distribution, and Treatment	4,244	4,449	4,888
Wastewater	1,467	1,701	1,869
Off-Road Equipment	13,608	14,000	14,837
Agriculture	161	215	241
TOTAL ^a	384,583	395,735	420,146
<i>Natural Working Lands and Forestry ^b</i>	<i>108,262</i>	<i>108,262</i>	<i>108,262</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-19 La Quinta GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

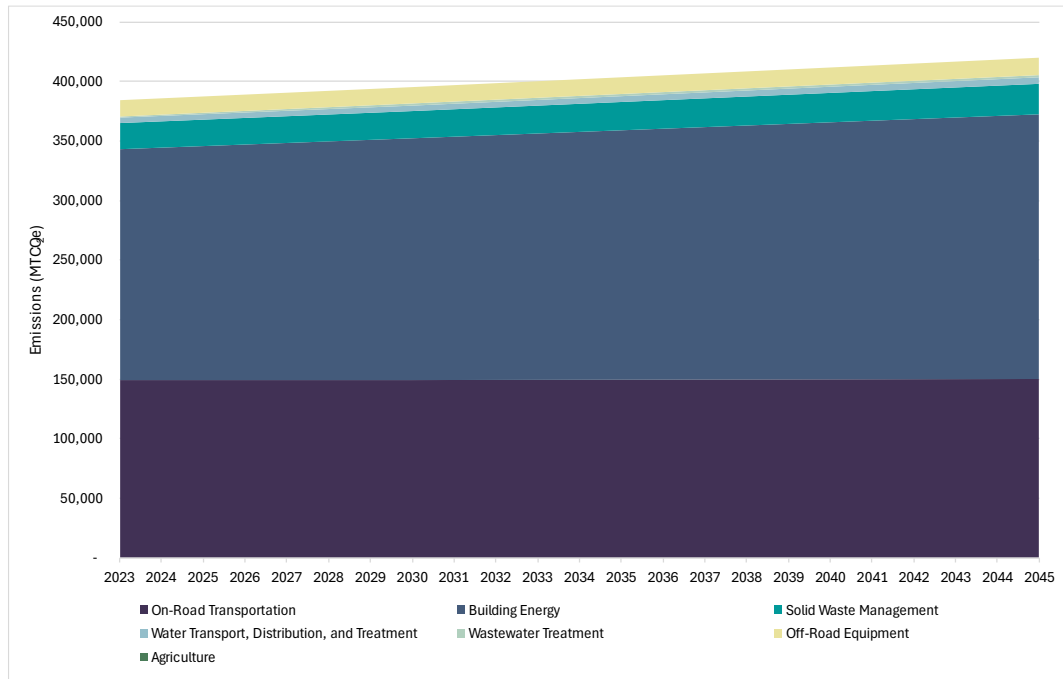
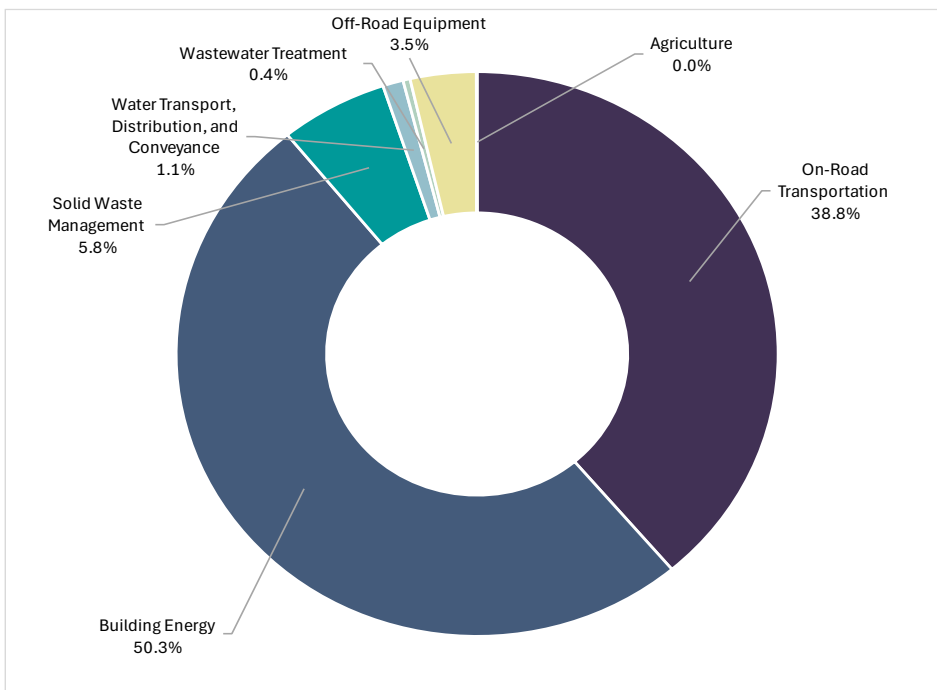


Figure A-20 shows each sector’s contribution to the City of La Quinta’s 2023 inventory, indicating that building energy is the greatest contributor to total emissions, at 50 percent, followed by on-road transportation at about 39 percent, and solid waste management at around 6 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

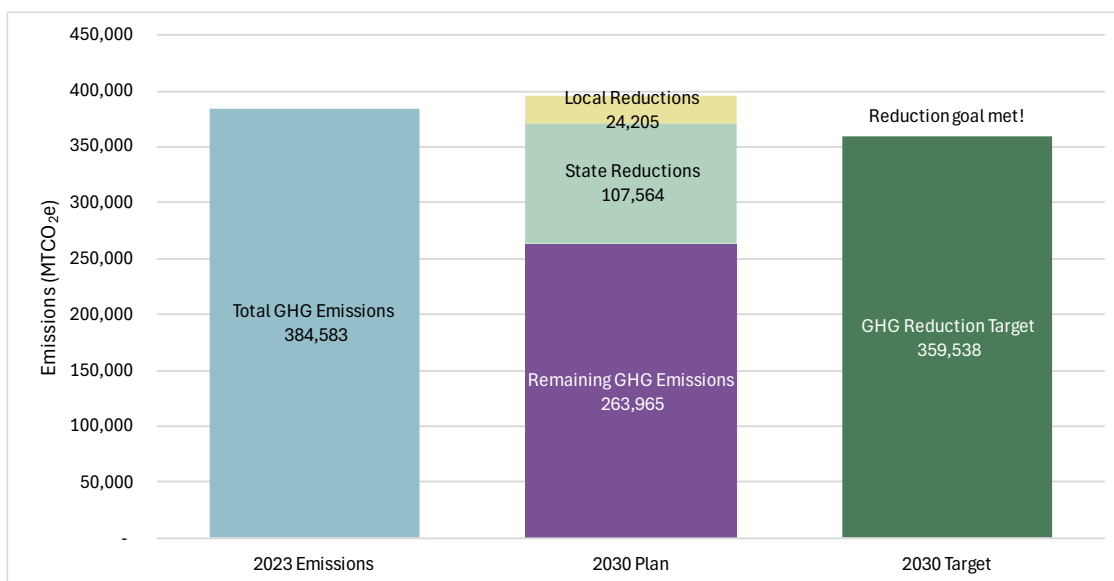
Figure A-20 2023 Emissions by Sector – La Quinta



Greenhouse Gas Forecast and Reduction Targets

The City of La Quinta is committed to supporting the state’s goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, La Quinta has set a 28 percent GHG reduction goal from 2006 levels by 2030. This equates to total annual emissions target of 359,538 MTCO₂e per year by the year 2030, based on the City’s population and jobs forecasts. **Figure A-21** shows how this target relates to the City’s business-as-usual (BAU) emissions forecast and is equivalent to a reduction of approximately 31 percent below the 2030 BAU forecast.

Figure A-21 City of La Quinta 2030 GHG Reduction Target (MTCO₂e)



The bars in **Figure A-21** show La Quinta’s 2023 GHG emissions total, 2030 BAU emissions forecast total, and the total emissions remaining after meeting the City’s emissions reduction target (30% below the 2006 GHG emissions level). The contribution of state and local reductions are overlaid on the 2030 BAU emissions forecast total (“2030 Plan”), representing the total emissions reductions achieved in 2030. As stated above, state reductions account for the majority (~79 percent) of the total reductions needed to achieve the 2030 target.

Table A-39 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that La Quinta more than meets its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Table A-39 Emissions Reductions by Sector for La Quinta					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	149,217	149,548	34,414	115,134	23%
Building Energy	193,619	202,512	82,994	119,517	38%
Solid Waste Management	22,266	23,311	11,531	11,780	47%
Water Transport, Distribution, and Conveyance	4,244	4,449	1,178	3,271	23%
Wastewater Treatment	1,467	1,701	263	1,438	2%
Off-Road Equipment	13,608	14,000	1,385	12,615	7%
Agriculture	161	215	4	211	-31%
Total	384,583	395,735	131,770	263,965	31%
Goal				359,538	
Goal Met?				Yes	
<i>Reductions Beyond Goal</i>				95,573	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for La Quinta in **Table A-40**.

Table A-40 La Quinta GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	53,818	132,402
SB 350 Clean Energy and Pollution Reduction Act	14,535	4,986
Title 24 Building Energy Efficiency Standards	1,651	3,403
California Solar Mandate	935	0
Transportation		

Table A-40 La Quinta GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	1,385	2,784
Vehicle Efficiency Standards	23,802	40,668
Advanced Clean Cars II (ACCII)	9,998	64,928
Water		
Water Conservation Mandates	1,178	4,888
Wastewater		
Renewable Electricity in Wastewater Systems	263	664
Total Reduction from State Measures	107,564	254,724

Local Measures

This section highlights the City of La Quinta's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-41** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-41 La Quinta's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	NQ	NQ
Energy-2	LED Bulbs and Fixtures	3,026	-
Energy-3	Smart Thermostat	338	13
Energy-4	Appliance Electrification Upgrades	NQ	NQ
Energy-5	Solar Window Film	228	-
Energy-6	Cool Roofs	14	-35
Energy-7	Roofline Insulation and Attic Encapsulation	300	577
Energy-8	HVAC Maintenance Program	623	902
Energy-9	Solar Installations for New Commercial and Industrial Development	105	-
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	2,848	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	4,573	-
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	614	NQ

Table A-41
La Quinta's 2030 and 2045 GHG Reduction Potential by Measure

Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	896
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	NQ	NQ
Off-Road-2	Lawn and Garden Equipment Electrification	NQ	NQ
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	9,305	10,224
Waste-2	Construction and Demolition Waste Diversion	1,832	2,684
Waste-3	Solid Waste Diversion	393	1,729
Waste-4	Food Waste and Organics Diversion	NQ	NQ
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	NQ	NQ
Water-2	Water Conservation	NQ	NQ
Total Local Reductions Anticipated ^a		24,205	16,708
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, La Quinta is expected to meet its 2030 GHG reduction target through the combination of state regulations and local measures selected by the City. **Table A-42** below summarizes La Quinta's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-42 La Quinta's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
BAU Forecast	395,735	420,146
Total Reductions from State Measures	107,564	254,724
Total Reductions from Local Measures	24,205	16,708
Resulting Community Emissions With CCAP Implementation ^a	263,965	148,715
Emissions Target	359,538	NQ
Target Exceeded By	95,573	NQ
NOTE: a - Totals may not sum due to rounding. NQ – not quantified		

City of Palm Desert



PALM DESERT

The City of Palm Desert is located in the center of the Coachella Valley and covers approximately 27 square miles.

The City is bordered by Rancho Mirage to the west and Indian Wells to the south and east. It is roughly 14 miles east of Palm Springs. The Santa Rosa Mountains lie south of the City. Like the entire Coachella Valley, Palm Desert experiences a desert climate, characterized by hot summers and warm winters, enjoying over 300 days of sunshine per year.

Palm Desert is known as the cultural and retail center of the desert communities in the Coachella Valley and benefits from a strong tourism industry. In fact, the city's economy is heavily dependent on tourism, golf courses, and related leisure activities – boasting boutiques, art galleries, and restaurants. Seasonally, 32,000 people flock to the City during the winter and spring (City of Palm Desert, 2025).

Based on socioeconomic data provided by the California Department of Finance (DOF), the City's population is expected to grow approximately 2 percent from 2023 to 2030, and 8 percent from 2023 to 2045. Households are expected to grow 8 percent from 2023 to 2030 and 20 percent from 2023 to 2045, while employment is expected to grow 4 percent and 13 percent over those same time periods.

Table A-43 below details socioeconomic data and growth projections for Palm Desert, including population, housing, and employment (DOF).

Table A-43 Palm Desert Socioeconomic Data			
Category	2023	2030	2045
Population	50,889	51,996	55,279
Households	36,898	39,707	44,154
Jobs	24,600	25,604	27,753

Greenhouse Gas Inventory and Emissions Forecasts

The City of Palm Desert Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions and under an "adjusted" forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-44 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045.

Figure A-22 provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-44 Palm Desert GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	272,460	274,600	282,476
<i>Light-Duty Vehicles</i>	<i>166,921</i>	<i>170,217</i>	<i>182,353</i>
<i>Heavy-Duty Vehicles</i>	<i>105,539</i>	<i>104,383</i>	<i>100,122</i>
Building Energy	236,668	248,985	271,722
<i>Residential Electricity</i>	<i>56,799</i>	<i>58,691</i>	<i>62,817</i>
<i>Residential Natural Gas</i>	<i>88,664</i>	<i>95,447</i>	<i>106,092</i>
<i>Non-Residential Electricity</i>	<i>56,373</i>	<i>58,593</i>	<i>63,515</i>
<i>Non-Residential Natural Gas</i>	<i>34,833</i>	<i>36,254</i>	<i>39,298</i>
Solid Waste Management	35,491	36,254	39,242
Water Transport, Distribution, and Treatment	5,230	5,344	5,805
Wastewater	1,808	2,043	2,219
Off-Road Equipment	18,574	19,332	22,123
Agriculture	122	162	182
TOTAL ^a	570,354	586,719	623,769
<i>Natural Working Lands and Forestry ^b</i>	<i>45,458</i>	<i>45,458</i>	<i>45,458</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-22 Palm Desert GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

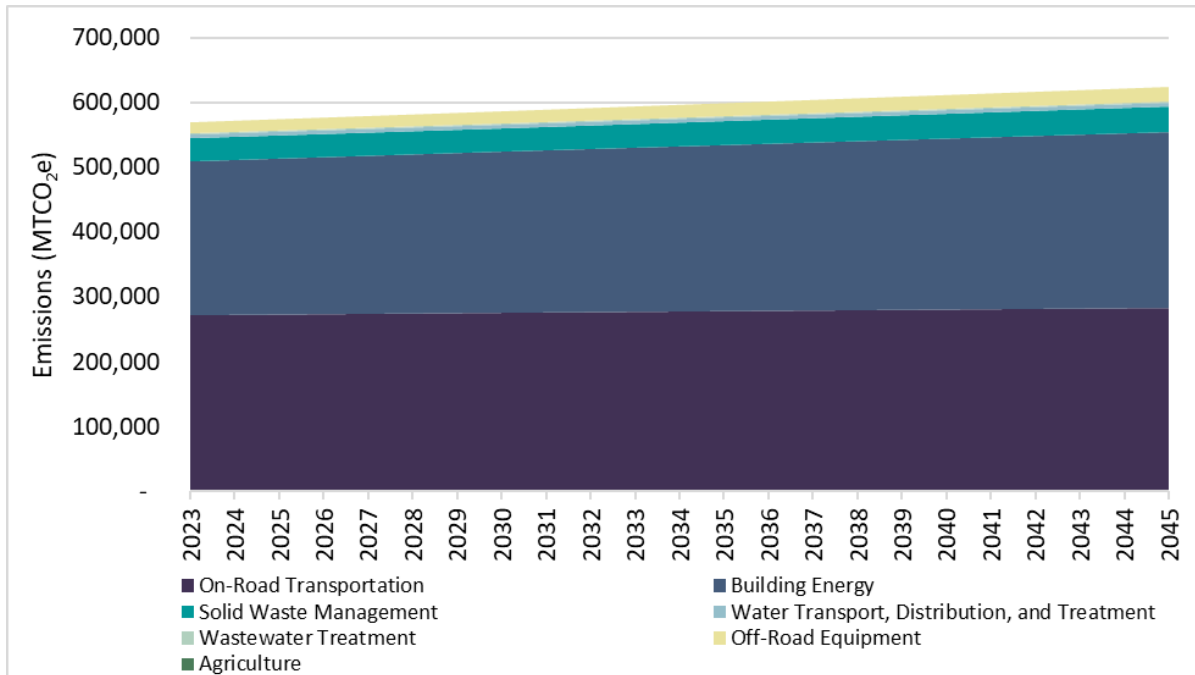
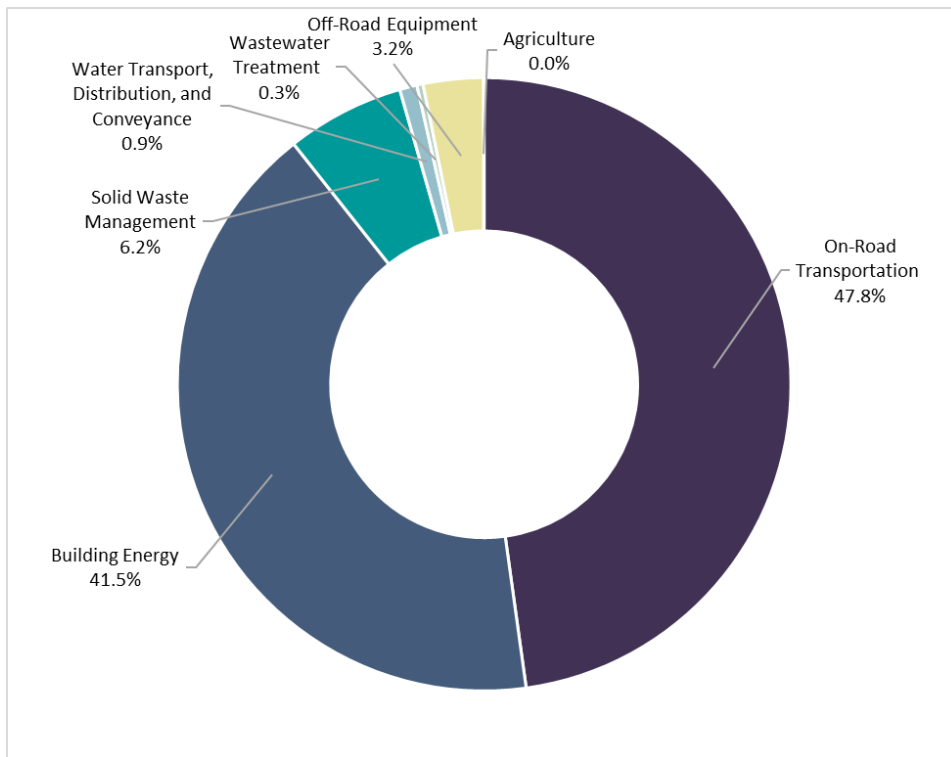


Figure A-23 shows each sector's contribution to the City of Palm Desert's 2023 inventory, indicating that on-road transportation is the greatest contributor to total emissions, at 48 percent, followed by building energy at about 41 percent, and solid waste management at around 6 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-23 2023 Emissions by Sector – Palm Desert

Greenhouse Gas Forecast and Reduction Targets

Palm Desert is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Palm Desert has set a 30 percent GHG reduction goal from 2023 levels by 2030 at a service population (SP) level (population + employment). In 2023, Palm Desert had a GHG emissions per service population level of 7.56. Aligned with the state's goals, the City's 2030 target is 5.27 MTCO_{2e} per service population, indicated in **Figure A-24** as the yellow diamond.

Figure A-24 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 30 percent and GHGs per SP (light green line) will decrease by 32 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 3 percent over that same time period. **Palm Desert is expected to meet its GHG per SP target by 2030** and would exceed the goal by 0.13 MTCO_{2e} per SP.

Figure A-24 Palm Desert 2030 GHG Reduction Target (MTCO₂e)

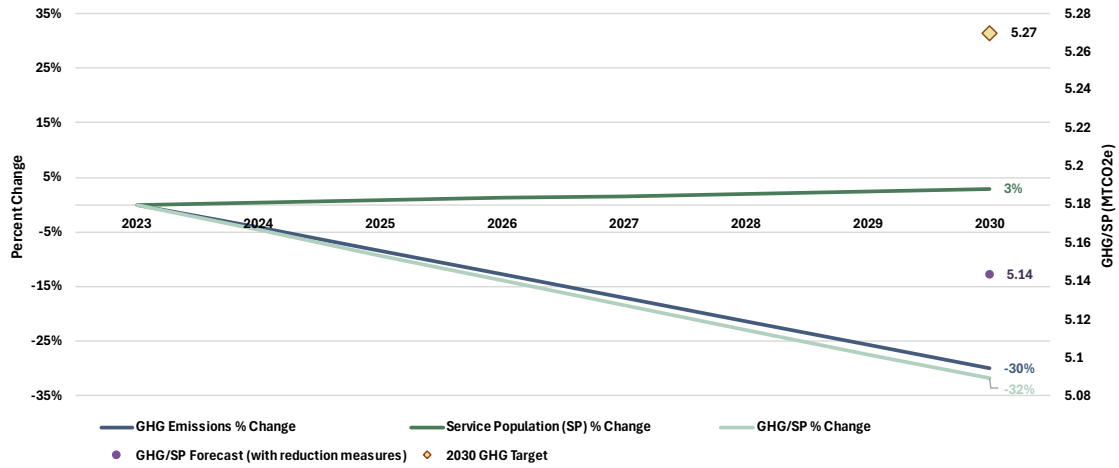


Table A-45 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Palm Desert exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Table A-45 Emissions Reductions by Sector for Palm Desert					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	272,460	274,600	59,971	214,629	21%
Building Energy	236,668	248,985	103,858	145,126	39%
Solid Waste Management	35,491	36,254	18,293	17,960	49%
Water Transport, Distribution, and Conveyance	5,230	5,344	3,608	1,736	67%
Wastewater Treatment	1,808	2,043	316	1,727	4%
Off-Road Equipment	18,574	19,332	1,515	17,817	4%
Agriculture	122	162	4	158	-30%
Total	570,354	586,719	187,566	399,153	38%
GHG/SP Total	7.56			5.14	
GHG/SP Goal				5.27	
Goal Met?				Yes	
<i>Goal Exceeded by</i>				<i>0.13</i>	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Palm Desert in **Table A-46**.

Table A-46 Palm Desert GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	46,138	141,640
SB 350 Clean Energy and Pollution Reduction Act	16,886	2,627
Title 24 Building Energy Efficiency Standards	2,195	7,406
California Solar Mandate	4,306	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	1,515	4,472

Table A-46
Palm Desert GHG Reductions from State Measures (MTCO₂e/yr)

State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Vehicle Efficiency Standards	43,179	76,738
Advanced Clean Cars II (ACCII)	16,050	104,050
Water		
Water Conservation Mandates	2,185	5,805
Wastewater		
Renewable Electricity in Wastewater Systems	316	789
Total Reduction from State Measures	132,000	343,526

Local Measures

This section highlights the City of Palm Desert's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-47** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-47
Palm Desert 2030 and 2045 GHG Reduction Potential by Measure

Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	18,680	40,773
Energy-2	LED Bulbs and Fixtures	3,819	-
Energy-3	Smart Thermostat	631	35
Energy-4	Appliance Electrification Upgrades	233	-
Energy-5	Solar Window Film	287	-
Energy-6	Cool Roofs	34	-47
Energy-7	Roofline Insulation and Attic Encapsulation	NQ	NQ
Energy-8	HVAC Maintenance Program	1,017	2,645
Energy-9	Solar Installations for New Commercial and Industrial Development	177	-
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	346	-
Energy-11	Solar Installations for Existing Homes	3,358	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	5,752	-
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	742	NQ

Table A-47
Palm Desert 2030 and 2045 GHG Reduction Potential by Measure

Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	997
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	-	1,154
Off-Road-2	Lawn and Garden Equipment Electrification	-	86
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	14,458	15,371
Waste-2	Construction and Demolition Waste Diversion	2,847	4,035
Waste-3	Solid Waste Diversion	611	2,600
Waste-4	Food Waste and Organics Diversion	378	402
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	2,185	-
Water-2	Water Conservation	7	-
Total Local Reductions Anticipated ^c		55,566	68,050
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Palm Desert is expected to meet its GHG/SP reduction target, achieving an additional 0.13 MTCO₂e per SP reduction by 2030. **Table A-48** below summarizes Palm Desert's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-48		
Palm Desert's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO₂e)		
	2030	2045
BAU Forecast	586,719	623,769
Total Reductions from State Measures	132,000	343,526
Total Reductions from Local Measures	55,566	68,050
Resulting GHG Emissions/SP with CCAP Implementation ^a	5.14	2.56
GHG/SP Target	5.27	NQ
Target Exceeded By	0.13	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

City of Palm Springs

Palm Springs lies off the Western edge of the Coachella Valley in central Riverside County. Palm Springs is bordered by the San Jacinto Mountains to the West and the Santa Rosa Mountains to the south. The City covers a geographical area of 96 square miles, making it the largest city in Riverside County by land area. The city’s population triples from November to March as seasonal residents flock to the city for the winter and spring seasons. Palm Springs is a prominent tourist destination, known for its unique blend of natural beauty, cultural richness, and recreational opportunities, and it receives over 1.5 million visitors annually. Known for its golf course, hiking and outdoor activities, and home to one of the largest yearly biking events (City of Palm Springs, 2025).



Based on socioeconomic data provided by the Southern California Association of Governments (SCAG) through the Riverside County Model (RIVCOM), the City’s population is expected to grow approximately 7 percent from 2023 to 2030, and 22 percent from 2023 to 2045. Households are expected to grow 8 percent from 2023 to 2030 and 25 percent from 2023 to 2045, while employment is expected to grow 7 percent and 23 percent over those same time periods.

Table A-49 below details socioeconomic data and growth projections for Palm Springs, including population, housing, and employment (RIVCOM).

Table A-49 Palm Springs Socioeconomic Data			
Category	2023	2030	2045
Population	50,499	54,075	61,739
Households	25,644	27,720	32,168
Jobs	34,002	36,452	41,701

Greenhouse Gas Inventory and Emissions Forecasts

The City of Palm Springs Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City’s baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City’s future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under “business-as-usual” (BAU) conditions and under an “adjusted” forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-50 provides a summary of the City’s 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-25** provides a graphical depiction of the data.

The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-50 Palm Springs GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	222,436	231,444	250,748
Light-Duty Vehicles	172,392	182,266	203,425
Heavy-Duty Vehicles	50,044	49,179	47,323
Building Energy	275,026	297,773	343,093
Residential Electricity	54,620	60,727	138,007
Residential Natural Gas	110,028	118,934	64,622
Non-Residential Electricity	57,686	61,624	69,924
Non-Residential Natural Gas	52,691	56,488	70,540
Solid Waste Management	38,685	41,316	46,753
Water Transport, Distribution, and Treatment	4,197	2,125	5,131
Wastewater	1,794	4,494	2,426
Off-Road Equipment	31,716	34,169	39,420
Agriculture	366	487	547
TOTAL ^a	574,219	611,809	688,118
Natural Working Lands and Forestry ^b	397,833	397,833	397,833
NOTES:			
a. Totals may not sum due to rounding.			
b. Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

Figure A-25 Palm Springs GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

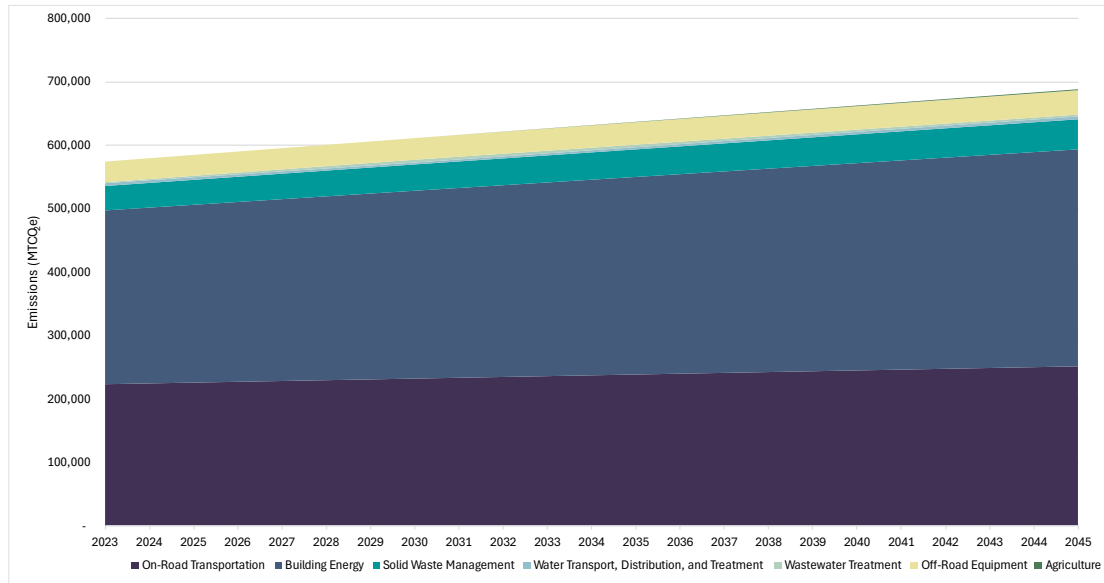
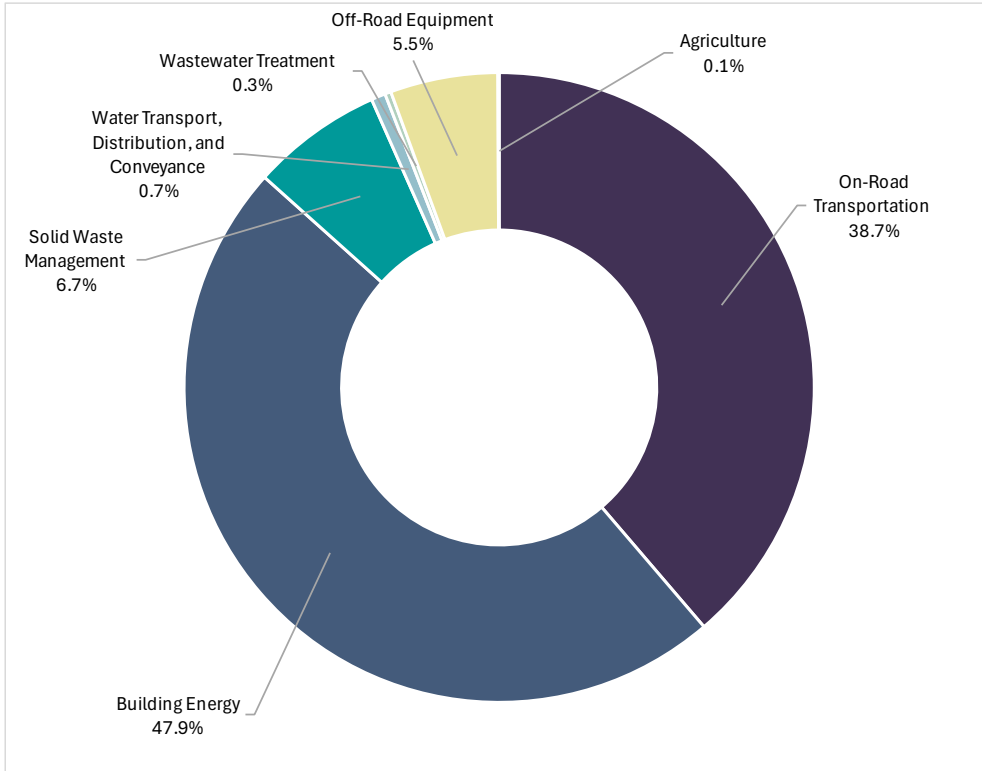


Figure A-26 shows each sector's contribution to the City of Palm Springs' 2023 inventory, indicating that building energy is the greatest contributor to total emissions, at 48 percent,

followed by on-road transportation at about 39 percent, and solid waste management at around 7 percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

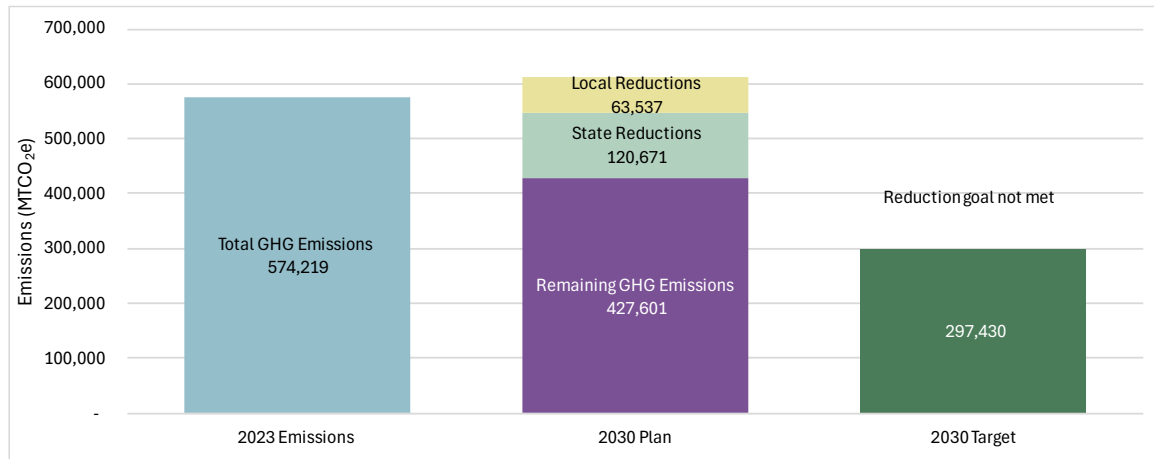
Figure A-26 2023 Emissions by Sector – Palm Springs



Greenhouse Gas Forecast and Reduction Targets

The City of Palm Springs is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Palm Springs has set a 40 percent GHG reduction goal from 1990 levels by 2030. This equates to total annual emissions target of 297,430 MTCO₂e per year by the year 2030, based on the City's population and jobs forecasts. **Figure A-27** shows how this target relates to the City's business-as-usual (BAU) emissions forecast and is equivalent to a reduction of approximately 48 percent below the 2023 GHG inventory.

Figure A-27 City of Palm Springs 2030 GHG Reduction Target (MTCO₂e)



The bars in **Figure A-27** show Palm Springs’ 2023 GHG emissions total, 2030 BAU emissions forecast total, and the total emissions remaining after meeting the City’s emissions reduction target (40% below the 1990 GHG emissions level). The contribution of state and local reductions are overlaid on the 2030 BAU emissions forecast total (“2030 Plan”), representing the total emissions reductions achieved in 2030. As shown above, state reductions account for the majority of the total reductions needed to achieve the 2030 target.

Table A-51 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Palm Springs does not meet its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Table A-51 Emissions Reductions by Sector for Palm Springs					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	222,436	231,444	60,341	171,103	23%
Building Energy	275,026	297,773	102,217	195,556	29%
Solid Waste Management	38,685	41,316	16,515	24,801	36%
Water Transport, Distribution, and Conveyance	4,197	2,125	1,041	1,084	74%
Wastewater Treatment	1,794	4,494	329	4,165	-132%
Off-Road Equipment	31,716	34,169	3,762	30,407	4%
Agriculture	366	487	4	483	-32%
Total	574,219	611,809	184,208	427,601	26%
Goal				297,430	
Goal Met?				No	
<i>Additional Reductions Needed</i>				<i>130,171</i>	
NOTES: Totals may not add up due to rounding. Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Palm Springs in **Table A-52**.

Table A-52 Palm Springs GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	42,869	174,953
SB 350 Clean Energy and Pollution Reduction Act	13,167	1,878
Title 24 Building Energy Efficiency Standards	4,582	9,278
California Solar Mandate	891	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	3,380	7,397

Table A-52
Palm Springs GHG Reductions from State Measures (MTCO₂e/yr)

State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Vehicle Efficiency Standards	37,226	67,744
Advanced Clean Cars II (ACCII)	17,186	116,073
Water		
Water Conservation Mandates	1,041	5,131
Wastewater		
Renewable Electricity in Wastewater Systems	329	862
Total Reduction from State Measures	120,671	383,317

Local Measures

This section highlights the City of Palm Springs' current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-53** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-53
Palm Springs' 2030 and 2045 GHG Reduction Potential by Measure

Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	23,250	48,735
Energy-2	LED Bulbs and Fixtures	5,223	-
Energy-3	Smart Thermostat	831	55
Energy-4	Appliance Electrification Upgrades	228	-
Energy-5	Solar Window Film	401	-
Energy-6	Cool Roofs	29	-32
Energy-7	Roofline Insulation and Attic Encapsulation	536	1,062
Energy-8	HVAC Maintenance Program	1,261	3,368
Energy-9	Solar Installations for New Commercial and Industrial Development	383	-
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	2,247	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	6,318	-
On Road Transportation			
Tier 2 Measures ^a	Commuter Trip Reduction and Public Transit	NQ	1,178
On-Road-7	Increase Transit Service and Frequency	-	-

Table A-53 Palm Springs' 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Tier 3 Measures ^b	Parking Pricing and Limited Requirements	5,929	NQ
On-Road-10	Parking Pricing and Limited Requirements	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	NQ	NQ
Off-Road-2	Lawn and Garden Equipment Electrification	382	-
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	16,515	18,856
Waste-2	Construction and Demolition Waste Diversion	NQ	NQ
Waste-3	Solid Waste Diversion	NQ	NQ
Waste-4	Food Waste and Organics Diversion	NQ	NQ
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	NQ	NQ
Water-2	Water Conservation	NQ	NQ
Total Local Reductions Anticipated ^c		63,537	73,222
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. b – Tier 3 measures are the cumulative GHG reduction potential of on-road measure 10. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, Palm Springs is not expected to meet its 2030 GHG reduction target. Palm Springs could meet its target by adopting more aggressive local measures. **Table A-54** below summarizes Palm Springs' projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-54 Palm Springs' Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
BAU Forecast	611,809	688,118
Total Reductions from State Measures	120,671	383,317
Total Reductions from Local Measures	63,537	73,222
Resulting Community Emissions With CCAP Implementation ^a	427,601	231,580
Emissions Target	297,430	NQ
Further Reductions Needed	130,171	NQ
NOTE: a - Totals may not sum due to rounding. NQ – not quantified		

City of Rancho Mirage



The City of Rancho Mirage is located at the center of the Coachella Valley. It is between Palm Springs to the west and Palm Desert to the east. The City spans about 25 square miles. Rancho Mirage has a desert climate and experiences hot summers and mild winters. The permanent population of Rancho Mirage in 2004 was 13,700. This increased to 18,295 as of January 1, 2017. The population of Rancho Mirage experiences large increases with temporary residents who flood the city during the Fall, Winter, and Spring seasons, leaving during the summer. As is the case with many cities in the Coachella Valley, a significant portion of the local economy is based on tourism, hotels, resorts, gold course, and outdoor activities. All attract tourists year-round (City of Rancho Mirage, 2025).

Based on socioeconomic data provided by the California Department of Finance (DOF), the City's population is expected to grow approximately 3 percent from 2023 to 2030, and 13 percent from 2023 to 2045. Households are expected to grow 9 percent from 2023 to 2030 and 24 percent from 2023 to 2045, while employment is expected to grow 5 percent and 14 percent over those same time periods.

Table A-55 below details socioeconomic data and growth projections for Rancho Mirage, including population, housing, and employment (DOF).

Table A-55 Rancho Mirage Socioeconomic Data			
Category	2023	2030	2045
Population	16,992	17,561	19,247
Households	14,985	16,382	18,592
Jobs	6,300	6,591	7,213

Greenhouse Gas Inventory and Emissions Forecasts

The City of Rancho Mirage Community GHG Inventory quantifies the annual emissions resulting from activities within the City by residents, businesses, and the local government in 2023. The community inventory provides an understanding of where GHG emissions originate and informs development of effective strategies and actions to reduce emissions.

The City's baseline Community GHG Inventory (2023) forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are projected forward from the more recent 2023 inventory, based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions and under an "adjusted" forecast scenario that accounts for state-mandated GHG reduction programs that affect all CVAG jurisdictions.

Table A-56 provides a summary of the City's 2023 community inventory and forecasted emissions for the years 2030 and 2045. **Figure A-28** provides a graphical depiction of the data. The boundaries of analysis, along with the methodology and assumptions used to develop the inventories and future projections, are included in Appendix C.

Table A-56 Rancho Mirage GHG Emissions Inventory and BAU Forecasts (MTCO ₂ e)			
Sector	2023	2030	2045
On-Road Transportation	84,005	85,209	89,826
<i>Light-Duty Vehicles</i>	<i>59,846</i>	<i>61,123</i>	<i>66,013</i>
<i>Heavy-Duty Vehicles</i>	<i>24,159</i>	<i>24,086</i>	<i>23,813</i>
Building Energy	139,386	147,945	164,485
<i>Residential Electricity</i>	<i>28,528</i>	<i>29,417</i>	<i>32,422</i>
<i>Residential Natural Gas</i>	<i>55,081</i>	<i>60,224</i>	<i>68,338</i>
<i>Non-Residential Electricity</i>	<i>33,076</i>	<i>34,556</i>	<i>37,735</i>
<i>Non-Residential Natural Gas</i>	<i>22,700</i>	<i>23,747</i>	<i>25,990</i>
Solid Waste Management	12,139	12,538	14,090
Water Transport, Distribution, and Treatment	1,746	1,805	2,044
Wastewater	604	690	782
Off-Road Equipment	2,338	2,446	2,728
Agriculture	116	154	172
TOTAL ^a	240,333	250,786	274,128
<i>Natural Working Lands and Forestry ^b</i>	<i>111,311</i>	<i>111,311</i>	<i>111,311</i>
NOTES:			
a - Totals may not sum due to rounding.			
b - Natural Working Lands and Forestry is included as an informational line item and does not count towards total emissions.			

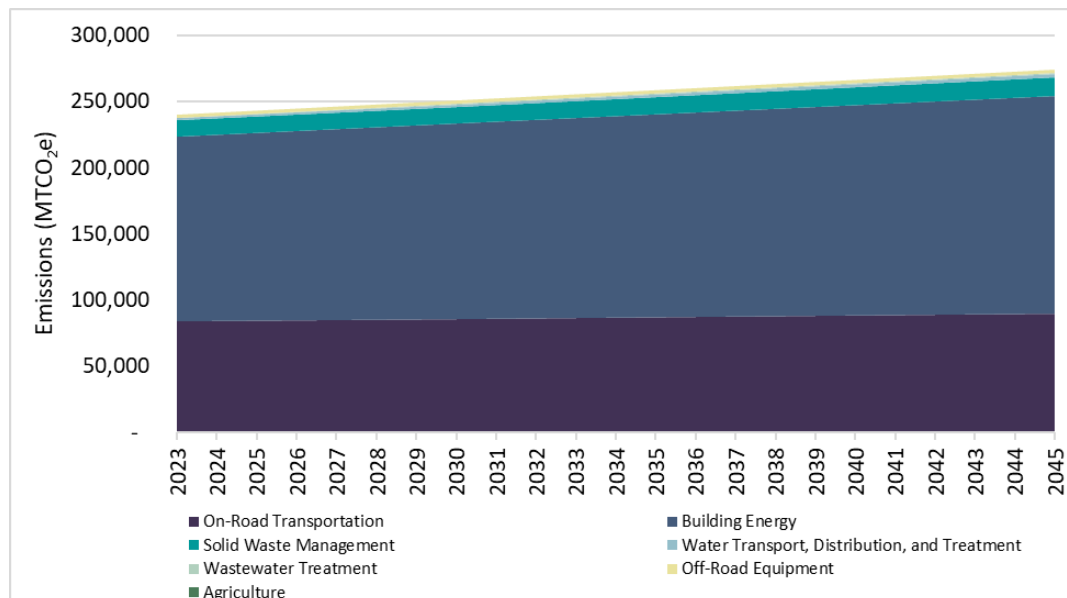
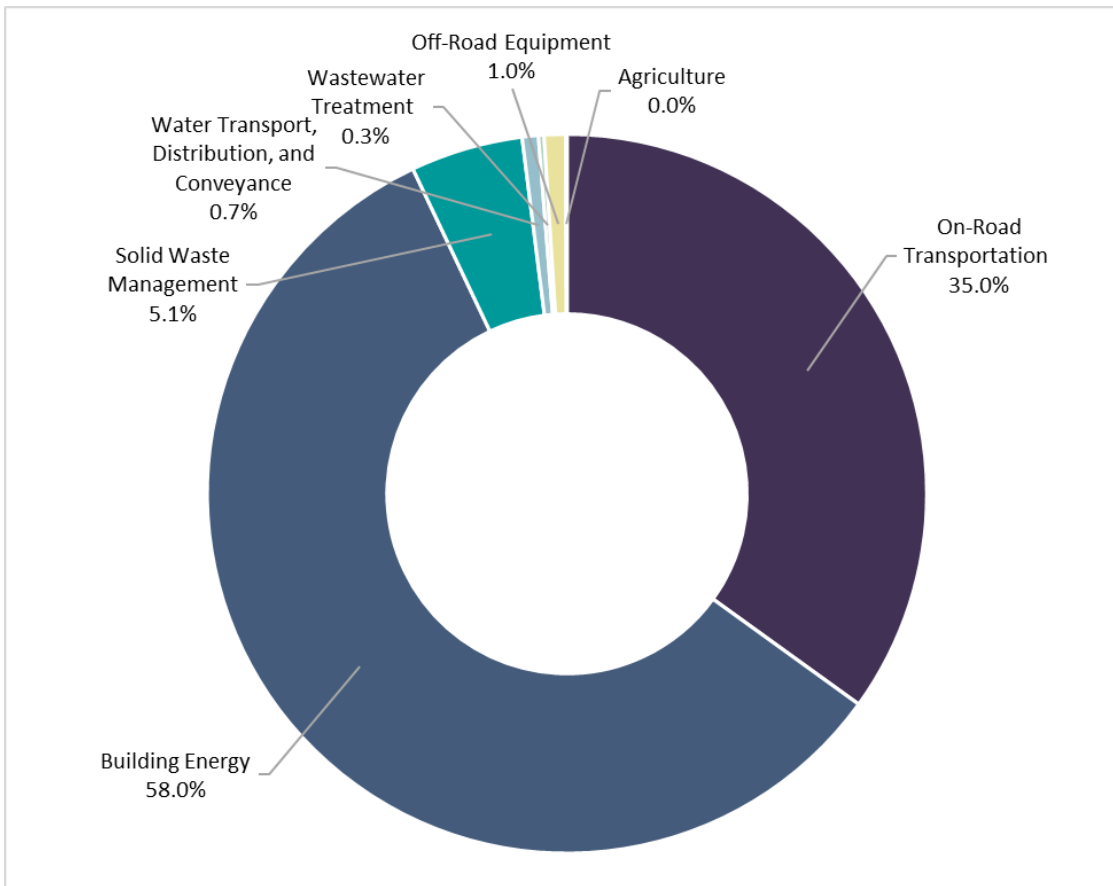
Figure A-28 Rancho Mirage GHG Emissions Inventory and BAU Forecasts (MTCO₂e)

Figure A-29 shows each sector's contribution to the City of Rancho Mirage's 2023 inventory, indicating that building energy is the greatest contributor to total emissions, at 58 percent, followed by on road transportation at 35 percent, and solid waste management at around 5

percent. The sectoral contributions to total emissions are expected to remain generally similar in 2030 and 2045.

Figure A-29 2023 Emissions by Sector – Rancho Mirage



Greenhouse Gas Forecast and Reduction Targets

Rancho Mirage is committed to supporting the state's goals for GHG emissions reduction by the year 2030 as mandated by SB 32. In order to achieve these goals, Rancho Mirage has set a 30 percent GHG reduction goal from 2023 levels by 2030 at a service population (SP) level (population + employment). In 2023, Rancho Mirage had a GHG emissions per service population level of 10.32. Aligned with the state's goals, the City's 2030 target is 7.19 MTCO₂e per service population, indicated in **Figure A-30** as the yellow diamond.

Figure A-30 also shows the percent change in GHG emissions, SP, and GHG/SP from 2023 to 2030. With the GHG reduction measures in place, GHG emissions (blue line) are expected to fall by 30 percent and GHGs per SP (light green line) will decrease by 33 percent from 2023 to 2030. Meanwhile, the service population (green line) is estimated to increase by 4 percent over that same time period. **Rancho Mirage is expected to meet its GHG per SP target by 2030** and would exceed the goal by 0.24 MTCO₂e per SP.

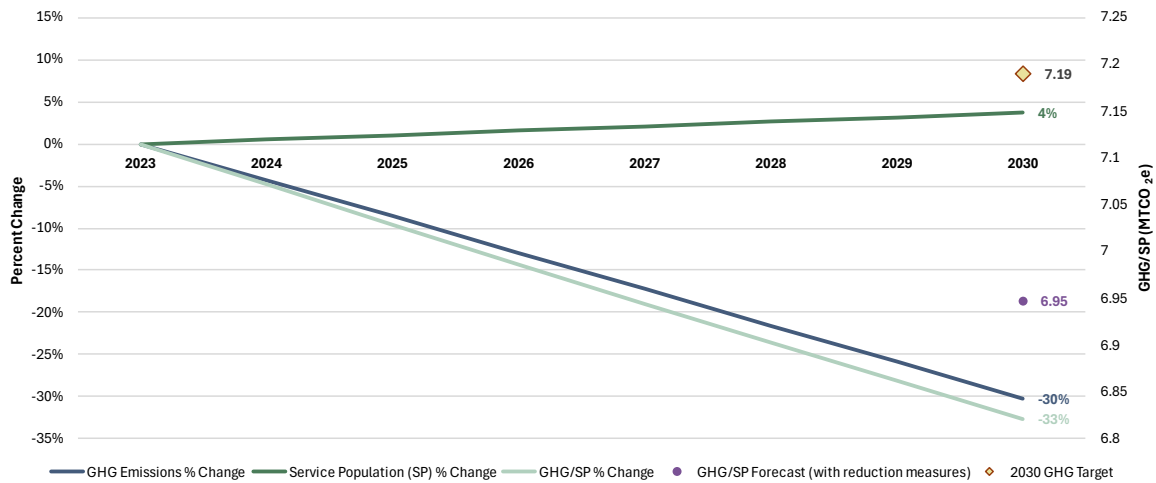
Figure A-30 Rancho Mirage 2030 GHG Reduction Target (MTCO₂e)

Table A-57 summarizes the 2023 inventory, 2030 BAU forecast, and GHG reduction (“Reduction Plan”) results by sector. It shows the percent reduction in each sector’s emissions in 2030 and demonstrates that Rancho Mirage exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the water, waste, and building energy sectors.

Sector	2023 Emissions (MTCO₂e)	2030 BAU (MTCO₂e)	2030 Reductions (MTCO₂e)	2030 Emissions with Reduction Plan (MTCO₂e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
On-Road Transportation	84,005	85,209	19,594	65,614	22%
Building Energy	139,386	147,945	56,902	91,043	35%
Solid Waste Management	12,139	12,538	5,002	7,536	38%
Water Transport, Distribution, and Conveyance	1,746	1,805	1,216	589	66%
Wastewater Treatment	604	690	107	583	3%
Off-Road Equipment	2,338	2,446	192	2,254	4%
Agriculture	116	154	4	150	-30%
Total	240,333	250,786	83,016	167,770	30%
GHG/SP Total	10.32			6.95	
GHG/SP Goal				7.19	
Goal Met?				Yes	
<i>Goal Exceeded by</i>				<i>0.24</i>	
NOTES: Totals may not add up due to rounding.					

Table A-57 Emissions Reductions by Sector for Rancho Mirage					
Sector	2023 Emissions (MTCO ₂ e)	2030 BAU (MTCO ₂ e)	2030 Reductions (MTCO ₂ e)	2030 Emissions with Reduction Plan (MTCO ₂ e)	Percent of Emissions Reduced (2030 Reduction Plan from 2023 Levels)
Dashes indicate no value or not applicable. Negative reduction percentages indicate an increase in emissions.					

Greenhouse Gas Reduction Measures

State Measures

Significant emissions reductions in community emissions are anticipated as a result of state programs and regulations. The anticipated reductions resulting from state measures is summarized for Rancho Mirage in **Table A-58**.

Table A-58 Rancho Mirage GHG Reductions from State Measures (MTCO ₂ e/yr)		
State Measures by Sector	2030 Reduction Potential	2045 Reduction Potential
Energy		
SB100 (2018) Renewables Portfolio Standard (RPS)	26,700	72,418
SB 350 Clean Energy and Pollution Reduction Act	4,475	0
Title 24 Building Energy Efficiency Standards	1,578	5,974
California Solar Mandate	2,651	0
Transportation		
Small Off-Road Engines Regulation and Zero-Emission Forklift Regulation	192	551
Vehicle Efficiency Standards	13,577	24,330
Advanced Clean Cars II (ACCI)	5,763	37,667
Water		
Water Conservation Mandates	478	2,044
Wastewater		
Renewable Electricity in Wastewater Systems	107	278
Total Reduction from State Measures	55,520	143,262

Local Measures

This section highlights the City of Rancho Mirage's current and planned GHG reduction initiatives across the sectors of Energy, Transportation, Solid Waste, Water and Wastewater, and Agriculture and Land Use. **Table A-59** provides a list of local reduction measures that the City will undertake, and the anticipated reductions expected by 2030 and 2045.

Table A-59 Rancho Mirage's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy			
Energy-1	Building Electrification	13,105	29,108

Table A-59 Rancho Mirage's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Energy-2	LED Bulbs and Fixtures	1,852	-
Energy-3	Smart Thermostat	419	23
Energy-4	Appliance Electrification Upgrades	96	-
Energy-5	Solar Window Film	137	-
Energy-6	Cool Roofs	13	-25
Energy-7	Roofline Insulation and Attic Encapsulation	282	550
Energy-8	HVAC Maintenance Program	595	1,296
Energy-9	Solar Installations for New Commercial and Industrial Development	100	-
Energy-10	On-site Solar Energy for New and Existing Warehouse Space	NQ	NQ
Energy-11	Solar Installations for Existing Homes	1,936	-
Energy-12	Solar Installations for Existing Commercial and Industrial Buildings	2,963	-
On Road Transportation			
Tier 1 Measures ^a	Land Use and Infrastructure	254	NQ
On-Road-1	Increase Housing Density	-	-
On-Road-2	Increase Land Use Diversity	-	-
On-Road-3	Light-Duty EV Infrastructure	-	-
On-Road-4	Pedestrian Infrastructure Improvements	-	-
On-Road-5	Bicycle and Micromobility Infrastructure Improvements	-	-
On-Road-6	Transition City and Agency Fleets to ZEVs	-	-
Tier 2 Measures ^b	Commuter Trip Reduction and Public Transit	NQ	366
On-Road-7	Increase Transit Service and Frequency	-	-
On-Road-8	Transit Oriented Development	-	-
On-Road-9	Transportation Demand Management	-	-
Off Road Equipment and Transportation			
Off-Road-1	Construction Equipment	0	142
Off-Road-2	Lawn and Garden Equipment Electrification	0	11
Solid Waste			
Waste-1	SB 1383 Organic Waste Recycling	5,002	5,482

Table A-59 Rancho Mirage's 2030 and 2045 GHG Reduction Potential by Measure			
Local Measures by Sector	Description	2030 Reduction Potential	2045 Reduction Potential
Waste-2	Construction and Demolition Waste Diversion	NQ	NQ
Waste-3	Solid Waste Diversion	NQ	NQ
Waste-4	Food Waste and Organics Diversion	NQ	NQ
Agriculture			
Ag-1	Urban Tree Planting	4	-
Ag-2	Local Agriculture and Community Gardens	NQ	NQ
Water and Wastewater			
Wastewater-1	Equipment Upgrades	NQ	NQ
Water-1	Increase Recycled Water Use	738	-
Water-2	Water Conservation	7	-
Total Local Reductions Anticipated ^c		27,497	36,951
NOTES: NQ – Not quantified because this measure was not selected by the City. (-) – Dashes indicate 0/no data a – Tier 1 measures are the cumulative GHG reduction potential of on-road measures 1-6. b – Tier 2 measures are the cumulative GHG reduction potential of on-road measures 7-9. c – Totals may not sum due to rounding.			

Meeting GHG Reduction Targets

As discussed earlier, the City of Rancho Mirage is expected to meet its GHG/SP reduction target, achieving an additional 0.24 MTCO₂e per SP reduction by 2030. **Table A-60** below summarizes Rancho Mirage's projected greenhouse gas (GHG) reductions for 2030 and 2045 resulting from local and state initiatives and indicates the extent to which these actions surpass the established emissions targets.

Table A-60 Rancho Mirage's Anticipated 2030 and 2045 GHG Reduction Summary (MTCO ₂ e)		
	2030	2045
BAU Forecast	250,786	274,128
Total Reductions from State Measures	55,520	143,262
Total Reductions from Local Measures	27,497	36,951
Resulting GHG Emissions/SP with CCAP Implementation ^a	6.95	3.55
GHG/SP Target	7.19	NQ
Target Exceeded By	0.24	NQ
NOTES: a - Totals may not sum due to rounding. NQ – not quantified		

Appendix B. WRCOG GHG Reduction Measures

This appendix includes tables of GHG reduction measures found in 7 existing local Climate Action Plans (CAPs) in the WRCOG region developed by the cities of Beaumont, Corona, Lake Elsinore, Murrieta, Moreno Valley, and Riverside, as well as the County of Riverside County. 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 Comprehensive Climate Action Plan (CCAP), which align very closely with the 2022 WRCOG Subregional CAP. If a local CAP measure is not accounted for in the CCAP it is categorized as “None Identified”. Additionally, any local CAP measures identified as “not quantified - supporting action” indicates that it is not quantified by the CCAP or it is a general or supporting measure that is not tied to a specific sector.

Table B-1 City of Beaumont – Summary of Community GHG Reduction Strategies and Emission Reductions (From CAP Table 8)			
Goal and Policy	2020 Emission Reductions (MTCO₂e)	2030 Emission Reductions (MTCO₂e)	CCAP 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

Table B-1 City of Beaumont – Summary of Community GHG Reduction Strategies and Emission Reductions (From CAP Table 8)			
Goal and Policy	2020 Emission Reductions (MTCO₂e)	2030 Emission Reductions (MTCO₂e)	CCAP Aligning Measure
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
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	295	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			

Table B-1 City of Beaumont – Summary of Community GHG Reduction Strategies and Emission Reductions (From CAP Table 8)			
Goal and Policy	2020 Emission Reductions (MTCO₂e)	2030 Emission Reductions (MTCO₂e)	CCAP Aligning Measure
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

Table B-2 City of Beaumont Summary of Municipal GHG Reduction Strategies and Emission Reductions (From CAP Table 9)			
Goal and Policy	2020 Emission Reductions (MTCO₂e)	2030 Emission Reductions (MTCO₂e)	CCAP 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

Table B-2 City of Beaumont Summary of Municipal GHG Reduction Strategies and Emission Reductions (From CAP Table 9)			
Goal and Policy	2020 Emission Reductions (MTCO₂e)	2030 Emission Reductions (MTCO₂e)	CCAP Aligning Measure
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	-

Table B-3 City of Corona – Summary of Community GHG Reduction Strategies and Emission Reductions (Based on CAP Table 9)			
Goals and Measures	2030 Emission Reductions (MT CO₂e)	2040 Emission Reductions (MT CO₂e)	CCAP 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

Table B-3 City of Corona – Summary of Community GHG Reduction Strategies and Emission Reductions (Based on CAP Table 9)			
Goals and Measures	2030 Emission Reductions (MT CO2e)	2040 Emission Reductions (MT CO2e)	CCAP Aligning Measure
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

Table B-3 City of Corona – Summary of Community GHG Reduction Strategies and Emission Reductions (Based on CAP Table 9)			
Goals and Measures	2030 Emission Reductions (MT CO2e)	2040 Emission Reductions (MT CO2e)	CCAP Aligning Measure
6.2: Light-Reflecting Surfaces for Energy Saving	601	633	LE-7: Cool Roofs and Pavements
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

Table B-4 City of Lake Elsinore – Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)			
Measure Number and Title	2020 GHG Reduction Potential (MT CO₂e)	2030 GHG Reduction Potential (MT CO₂e)	CCAP 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

Table B-4 City of Lake Elsinore – Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)			
Measure Number and Title	2020 GHG Reduction Potential (MT CO₂e)	2030 GHG Reduction Potential (MT CO₂e)	CCAP Aligning Measure
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
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

Table B-4 City of Lake Elsinore – Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)			
Measure Number and Title	2020 GHG Reduction Potential (MT CO₂e)	2030 GHG Reduction Potential (MT CO₂e)	CCAP Aligning Measure
			LT-10: Local ZEV Programs
Measure T-5.2: Municipal Fleet Vehicle Purchasing Policy	25	50	None Identified
<i>Subtotal Transportation and Land Use</i>	<i>62,138</i>	<i>124,279</i>	
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
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

Table B-4 City of Lake Elsinore – Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)			
Measure Number and Title	2020 GHG Reduction Potential (MT CO₂e)	2030 GHG Reduction Potential (MT CO₂e)	CCAP Aligning Measure
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
<i>Subtotal Energy</i>	<i>89,131</i>	<i>177,817</i>	
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
Measure S-1.4: Construction and Demolition Waste	152	152	LR-1: Zero Waste

Table B-4 City of Lake Elsinore – Summary of Greenhouse Gas Reduction Measure Potential (From CAP Table 5-3)			
Measure Number and Title	2020 GHG Reduction Potential (MT CO₂e)	2030 GHG Reduction Potential (MT CO₂e)	CCAP Aligning Measure
Diversion			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
<i>Subtotal Solid Waste</i>	<i>8,427</i>	<i>9,525</i>	
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
<i>Subtotal Public Education and Outreach</i>	<i>Not applicable</i>		
TOTAL REDUCTION FROM LOCAL MEASURES	159,696	311,621	
TOTAL REDUCTION FROM STATE AND LOCAL MEASURES	399,224	768,105	

Table B-5
City of Moreno Valley CAP Strategies by Sector
(From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP 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	LT-5: Increase Transit Service and Frequency
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	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	RT-2: Telecommuting LT-11: Subsidized Transit

Table B-5
City of Moreno Valley CAP Strategies by Sector
(From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
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	RT-2: Telecommuting LT-3: Carshare & Carpool Programs LT-11: Subsidized Transit
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	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
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	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	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	LT-10: Local ZEV Programs
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	Supportive (CAPCOA)	0%	0	LT-8: Increase Land Use Diversity

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
	such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.				
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	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements
TOTAL EMISSIONS REDUCTION				250,075	
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	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	7.0% (0.25 x 0.3 = 0.75; CAPCOA)	7.0%	22,409	LE-1: Expand Local Renewable Energy Production

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
	fees or streamlined permit approval processes.				
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	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	LE-3: Improve Energy Efficiency of Existing Buildings
TOTAL EMISSIONS REDUCTION				65,628	
RESIDENTIAL CAP STRATEGIES					

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
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	None Identified
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	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	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	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	LE-3: Improve Energy Efficiency of Existing Buildings

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
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	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	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	LE-3: Improve Energy Efficiency of Existing Buildings
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	LE-3: Improve Energy Efficiency of Existing Buildings
TOTAL EMISSIONS REDUCTION				58,742	
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	LE-5: Traffic & Street Light Upgrades

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
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	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	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	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	LE-3: Improve Energy Efficiency of Existing Buildings
TOTAL EMISSIONS REDUCTION				30,945	

Table B-5
City of Moreno Valley CAP Strategies by Sector
(From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e/year)	CCAP 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	None Identified

Table B-5
City of Moreno Valley CAP Strategies by Sector
(From CAP Tables 4-1 to 4-7)

ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e/year)	CCAP Aligning Measure
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	None Identified
TOTAL EMISSIONS REDUCTION				6,160	
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	None Identified
PS-2	Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy	5.0 – 10.0% (EPA)	10.0%	121	LE-3: Improve Energy Efficiency of Existing Buildings

Table B-5 City of Moreno Valley CAP Strategies by Sector (From CAP Tables 4-1 to 4-7)					
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e/year)	CCAP Aligning Measure
	efficient equipment.				
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	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	LE-3: Improve Energy Efficiency of Existing Buildings
TOTAL EMISSIONS REDUCTION				187	
NATURAL RESOURCES CAP STRATEGIES					
NC-1	Require new landscaping to be climate appropriate.	Supportive (CAPCOA)	0%	0	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	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	LE-6: Shade Trees
TOTAL EMISSIONS REDUCTION				0	

Table B-6
City of Murrieta Summary of GHG Reduction Measure Performance
(From CAP Table 3-4)

Number	Strategy and Measure	2020 GHG Reductions (MTCO ₂ e/Year)	CCAP Aligning Measure
Community Involvement Strategy			
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	Supporting Measure	Not quantified-Supporting actions
CSV-15	A community taking a leadership role in resource conservation and reduction of greenhouse gas emissions by implementing programs to improve municipal operations.	97	Not quantified-Supporting actions
HC-1	Application of innovative and model best practices in the community health field.	253	Not quantified-Supporting actions
Subtotal		350	
Land Use and Community Vision Strategy			
LU-1	A complementary balance of land uses throughout the community that meets the needs of existing residents and businesses as well as anticipated growth, and achieves the community's vision.	18,674	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
LU-4	A housing stock that meets the diverse needs of Murrieta's existing and future residents.	Supporting Measure	Not quantified-Supporting actions
LU-5	Promotion of quality industrial development that provides local employment opportunities.	3,641	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
LU-6	Land use policy that encourages job retention and attraction.	52,288	LT-7: Increase Housing Density LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
LU-7	Economically viable, vital, and attractive commercial centers throughout the City that serve the needs of the community.	Supporting Measure	LT-8: Increase Land Use Diversity LT-9: Transit-Oriented

Table B-6
City of Murrieta Summary of GHG Reduction Measure Performance
(From CAP Table 3-4)

Number	Strategy and Measure	2020 GHG Reductions (MTCO ₂ e/Year)	CCAP Aligning Measure
			Development
LU-8	A community that provides opportunities for mixed use and/or transit-oriented development.	784	LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
LU-9	Land use patterns and urban design that support healthy and sustainable lifestyles and businesses.	2,334	LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
LU-10	A community that provides pedestrian-friendly environments for residential, commercial, business, and recreation uses.	Supporting Measure	LT-2: Pedestrian Infrastructure Improvements
ED-3	A sound, stable, and diversified economic base.	Supporting Measure	Not quantified-Supporting measure
ED-4	Positive balance between the supply of retail opportunities and demand for goods and services.	Supporting Measure	LT-8: Increase Land Use Diversity LT-9: Transit-Oriented Development
ED-5	An improved jobs/housing balance.	Supporting Measure	LT-8: Increase Land Use Diversity
ED-6	An educated and highly-skilled labor force.	Supporting Measure	Not quantified-Supporting measure
ED-8	Strategic Approach to Economic Growth	Supporting Measure	Not quantified-Supporting measure
ED-10	A revitalized and economically stable Historic Downtown Murrieta.	Supporting Measure	Not quantified-Supporting measure
AQ-6	Stationary source pollution (point source and area source) are minimized through existing and future regulations and new technology.	Supporting Measure	Not applicable – large stationary sources not included in inventory
Subtotal		77,721	16.56%
Transportation and Mobility Strategy			
LU-22	Natural and visual resources are valued resources to maintain the rural character of the	Supporting	Not quantified-Supporting measure

Table B-6
City of Murrieta Summary of GHG Reduction Measure Performance
(From CAP Table 3-4)

Number	Strategy and Measure	2020 GHG Reductions (MTCO₂e/Year)	CCAP Aligning Measure
	Los Alamos Hills.	Measure	
LU-24	Historic Murrieta as the City's cultural, civic and community center.	Supporting Measure	Not quantified-Supporting measure
LU-25	Collaboration with Federal, State, County, and other regional agencies and authorities to ensure compliance with existing and future legislation that affects the City of Murrieta.	Supporting Measure	Not quantified-Supporting measure
CIR-1	A circulation system that serves the internal circulation needs of the City, while also addressing the inter-community or through travel needs.	7,470	LT-9: Transit-Oriented Development LT-5: Increase Transit Service & Frequency
CIR-2	A comprehensive circulation system that promotes safety.	14,939	LT-2: Pedestrian Infrastructure Improvements
CIR-5	A supported regional transportation system that serves existing and future travel between Murrieta and other population and employment centers within southwest Riverside County and the larger region, and that accommodates the regional travel needs of developing areas outside the City.	1,867	LT-9: Transit-Oriented Development
CIR-6	Alternative travel modes and facilities are available to serve residents and employers/employees and reduce vehicle miles traveled.	37,345	LT-3: Carshare & Carpool Programs
CIR-7	Residential areas and activity centers are accessible to all pedestrians, including persons with disabilities or having special accessibility needs.	934	LT-2: Pedestrian Infrastructure Improvements
CIR-8	Development, expansion, and maintenance of a network of bicycle, pedestrian, and multi-use trails that allows residents to travel between parks, schools, neighborhoods, and other major destinations without driving.	6,536	LT-1: Bicycle Infrastructure Improvements LT-2: Pedestrian Infrastructure Improvements
AQ-4	Mobile source emissions are reduced by providing a balance of jobs and housing that serve the needs of the community.	18,674	LT-8: Increase Land Use Diversity LT-9: Transit-

Table B-6 City of Murrieta Summary of GHG Reduction Measure Performance (From CAP Table 3-4)			
Number	Strategy and Measure	2020 GHG Reductions (MTCO₂e/Year)	CCAP Aligning Measure
			Oriented Development
AQ-5	Air quality is improved through an efficient circulation system, reduced traffic congestion, and reduced vehicle miles traveled.	47	LT-5: Increase Transit Service & Frequency LT-6: Traffic Signal Coordination
Subtotal		87,812	
Energy Use and Conservation Strategy			
CSV-12	Energy conservation and the generation of energy from renewable sources is prioritized as part of an overall strategy to reduce greenhouse gas emissions.	54,588	LE-1: Expand Local Renewable Energy Production
CSV-14	A community that encourages and incentivizes the sustainable development of buildings and neighborhoods, particularly with respect to durability, energy and water use, and transportation impacts.	120,120	General: Covered by multiple measures
Housing Element Goal 2	Conserve and enhance the quality of existing housing and residential neighborhoods in Murrieta.	Supporting Measure	Not quantified- Supporting actions
Subtotal		174,708	
Water Use and Efficiency Strategy			
INF-2	Infrastructure for recycled water is expanded throughout Murrieta for irrigation and other non-potable uses.	4,019	LW-1: Increase Recycled Water Use
CSV-1	A community that conserves, protects, and manages water resources to meet long-term community needs, including surface waters, groundwater, imported water supplies, storm water, and wastewater.	10,097	SW-1: Water Conservation Measures
CSV-2	Murrieta promotes compliance with requirements from the State and appropriate agencies regarding comprehensive water conservation measures in buildings and landscaping.	Supporting Measure	SW-1: Water Conservation Measures
Subtotal		14,116	
Waste Reduction and Recycling Strategy			

Table B-6
City of Murrieta Summary of GHG Reduction Measure Performance
(From CAP Table 3-4)

Number	Strategy and Measure	2020 GHG Reductions (MTCO₂e/Year)	CCAP Aligning Measure
INF-1	New development and redevelopment is coordinated with the provision of adequate infrastructure for water, sewer, storm water, and energy.	Supporting Measure	Not quantified-Supporting actions
CSV-13	Solid waste is diverted from landfills through waste reduction, re-use and recycling.	7,009	SR-1: Recycling and Waste Diversion Mandates
Subtotal		7,009	
Open Space Strategy			
CSV-9	A community that promotes the growth of an urban forest and water-efficient landscaping, recognizing that plants provide natural services such as habitat, storm water management, soil retention, air filtration, and cooling, and also have aesthetic and economic value.	1,590	General: Covered by multiple measures; Except for Urban Forests
CSV-10	Fresh food is grown locally and made available through multiple venues that maintain a link to the City's agricultural heritage and promote healthy eating.	Supporting Measure	Not quantified-Supporting actions
ROS-7	Open space areas are planned to protect, conserve, and utilize resources of unique character and value for the community.	Supporting Measure	Not quantified-Supporting actions
ROS-8	New development is part of a coordinated system of open space, parkland, recreation facilities, and trails.	Supporting Measure	Not quantified-Supporting actions
ROS-9	Public plazas or green spaces provide additional open space opportunities for existing and future residents and employees.	Supporting Measure	Not quantified-Supporting actions
Subtotal		1,590	
Statewide Reductions			
	SB 1078 and SB 107	53,691	
	AB 1493 and EO S-1-07	52,389	
Subtotal Statewide Reductions		106,080	
Total Reductions		469,386	
		15.21% from 2009 baseline	

Table B-7 City of Riverside 2020 and 2035 Reductions from State and Regional Measures (From CAP Table B.3-1)				
State and Regional Measures by Sector		2020 Reductions (MT CO ₂ e/yr)	2035 Reductions (MT CO ₂ e/yr)	CCAP Aligning Measure
SR-1	Renewables Portfolio Standard	363,096	372,020	-
SR-2	2013 California Building Energy Efficiency Standards (Title 24, Part 6)	19,156	62,927	-
SR-3	HERO Residential Program	38,681	64,964	-
SR-4	HERO Commercial Program	6,618	86,276	-
SR-5	Edison Energy Action Plans	N/A	N/A	-
Energy Subtotal		427,551	586,187	
SR-6	Pavley & Low Carbon Fuel Standard	429,447	694,841	-
SR-7	Metrolink Expansions	9,045	11,289	-
SR-8	Express Lanes	23,858	29,779	-
SR-9	Congestion Pricing	1,272	1,588	-
SR-10	Telecommuting	15,905	19,853	-
SR-11	Goods Movement	8,893	10,811	-
SR-12	Electric Vehicle Plan and Infrastructure	31,811	39,705	-
Transportation Subtotal		520,232	807,866	
SR-13	Construction and Demolition Waste Diversion	1,789	4,865	LR-1: Zero Waste Initiatives 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	

Table B-8
City of Riverside 2020 and 2035 Reductions from Local Measures
(From CAP Table B.3-2)

Local Measures by Sector		2020 Reductions (MT CO₂e/yr)	2035 Reductions (MT CO₂e/yr)	CCAP 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	None Identified
E-6	Riverside Public Utilities Technology Grants	Supporting	Supporting	None Identified
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 LT-9: Transit-Oriented Development
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

Table B-8
City of Riverside 2020 and 2035 Reductions from Local Measures
(From CAP Table B.3-2)

Local Measures by Sector		2020 Reductions (MT CO₂e/yr)	2035 Reductions (MT CO₂e/yr)	CCAP Aligning Measure
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
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	None Identified
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	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
SW-2	Food Scrap and Paper Diversion	571	9,317	LR-1: Zero Waste Initiatives SR-1: Recycling and Waste Diversion Mandates
Solid Waste Subtotal		1,039	10,555	

Table B-8 City of Riverside 2020 and 2035 Reductions from Local Measures (From CAP Table B.3-2)				
Local Measures by Sector		2020 Reductions (MT CO₂e/yr)	2035 Reductions (MT CO₂e/yr)	CCAP Aligning Measure
A-1	Local Food and Agriculture	Supporting	Supporting	-
TOTAL LOCAL ACTION REDUCTIONS		189,399	275,273	

Appendix C. GHG Quantification Methods

This section presents the overall methods used to prepare the community GHG emissions inventories and BAU forecasts for CVAG. It contains the definitions and terminology relevant to the inventories, inventory accounting protocols used, emissions factors, and analysis methods.

GHG Inventory Methodology

GHG Inventory Definitions

Community Inventory. This term refers to a comprehensive assessment of greenhouse gas (GHG) emissions within a specific community. It only includes emissions that are under the control or subject to the influence of that jurisdiction and are geographical, meaning that the emissions included in the inventory or the activities that contribute to emissions must occur inside the jurisdictional boundary.

Direct emissions, such as natural gas combustion in buildings, are included in the inventory if a jurisdiction can affect those emissions by influencing energy use (such as through energy efficiency measures). For indirect emissions – for example, solid waste that is initially disposed of within the jurisdiction but is sent to a landfill outside the jurisdiction – would be included if the jurisdiction can affect emissions reductions among the population, such as waste diversion programs.

The community inventory includes the collection and analysis of data from various sources including building energy, on road transportation, off-road equipment, agriculture, solid waste management, wastewater treatment, water transport, distribution, and treatment emissions, and natural and working lands emission sinks. The inventory aims to provide a detailed overview of the community's current emissions and serves as a foundation for developing local climate action plans.

BAU Forecast. The emissions forecasts for 2030 and 2045 show the business-as-usual emissions associated with each jurisdiction's future community emissions. The forecast accounts for any emissions reduction programs that were already in place during 2023 that would impact the baseline inventory, but it does not account for any emissions reduction programs implemented after 2023 or changes to those actions that occurred after 2023.

Unit of Measure. The unit of measure used throughout the GHG inventories and forecasts is the metric ton of CO₂ equivalent (MTCO₂e). This is the internationally used unit that combines the varying warming-effectiveness of the primary greenhouse gases (e.g., CO₂, CH₄, and N₂O) into a single unit, by multiplying each gas by its global warming potential (GWP). GWP is the measure of how much a given mass of GHG contributes to global warming. GWP compares the relative warming effect of other gases to that of CO₂.

Coachella Valley Association of Governments

Business as Usual Forecasts for 2030 and 2045

BAU forecast projections were developed for 2030 and 2045. The projections estimate the quantity of emissions resulting from each jurisdiction in each of the forecast years. Because it does not account for any programs, measures, or activities that would reduce emissions, the projections reflect the impacts of socioeconomic growth. The projections do, however, account for the impact of any programs, measures, or activities that were implemented prior to 2023, as these would have already lowered the baseline year emissions.

As such, the future year-projections can be used to determine the magnitude of the reductions that need to be achieved in those future years to reach each jurisdiction's emissions-reduction target. The BAU projections are based on current energy consumption and activity data, the anticipated growth rates in socioeconomic data provided by the jurisdictions and CVAG, and other appropriate data sources, as listed in this report. Consistent with California's BAU projections, the future year BAU emissions projections do not assume the implementation of any federal, state, or local reduction measures. Rather, the future emissions are projected based on current energy and carbon intensity in the existing economy. The specific assumptions associated with the growth rates are discussed in "Analysis Methods".

The methods and assumptions for the projections discussed in the following sections are intended to produce a reasonable estimate of emissions for the future years. Although these assumptions are supported by established inventory protocols and widely used inventory methodologies, the methods for estimating BAU forecast emissions for the 10-jurisdiction subregion are subject to certain limitations. Specifically, in cases where future emission factor data are limited, the emission factors were assumed to remain constant from the current year's inventory. Additionally, emissions were estimated based on historical trends in some emissions-generating activities. However, it is possible that future emissions may not actually follow past trends.

Inventory Protocols

There are several accepted protocols for estimating emissions to prepare GHG inventories. Consistent with the previous inventory analysis and with standard practice among other municipal governments in California and the United States, the ICLEI U.S. Community Protocol for Accounting and reporting of Greenhouse Gas Emissions was the primary protocol used to prepare the inventories (ICLEI—Local Governments for Sustainability USA 2012). This inventory includes the following emissions activities from the ICLEI Community Protocol: use of electricity, use of fuel in stationary applications, use of on-road motor vehicles, water consumption, solid waste disposal, wastewater treatment and agricultural activity. The protocol includes these activities, because a municipal government typically has control or substantial influence over such activities.

Although the ICLEI Community Protocol is the primary tool that was used for this analysis, other resources relevant to GHG emissions accounting were also used. The ICLEI Community Protocol was supplemented with factors, methods, and assumptions from these other resources, which include the following: California Air Resources Board, U.S. Environmental Protection Agency,

California Energy Commission, and California Air Pollution Control Officer's Association. The next section includes a table of emission factors and constants used in the inventory calculations.

Emission Factors and Constants

Table C-1 Greenhouse Gas Emission Factors and Constants		
Source	Emission Factor	Reference
Building Energy		
<i>Electricity</i>		
Southern California Edison	374 lb CO ₂ e/MWh	1
Imperial Irrigation District	0.00019 MT CO ₂ /kWh	2
	5.22e-09 MT CH ₄ /kWh	2
	6.02e-10 MT N ₂ O/kWh	2
	0.0000336 g SF ₆ /kWh	2
Desert Community Energy - Carbon Free	0 MT CO ₂ /kWh	3
	0 MT CH ₄ /kWh	3
	0 MT N ₂ O/kWh	3
	0.0000336 g SF ₆ /kWh	3
Desert Community Energy - Desert Saver	8.55e-05 MT CO ₂ /kWh	3
	5.15e-09 MT CH ₄ /kWh	3
	6.88e-10 MT N ₂ O/kWh	3
	0.0000336 g SF ₆ /kWh	3
Electricity Transmission & Distribution Loss Factor 2023	5.1%	4
Electricity T&D Loss Rate (2030)	4.9%	4
Electricity T&D Loss Rate (2045)	5.4%	4
<i>Natural Gas</i>		
Residential & commercial uses	66.88 kg CO ₂ /MMBtu	5
	3 g CH ₄ /MMBtu	6
	.6 g N ₂ O/MMBtu	5
Distillate Fuel Oil No. 2	73.96 kg CO ₂ /MMBtu	5
	3 g CH ₄ /MMBtu	5
	.6 g N ₂ O/MMBtu	5
HGL	74.92 kg CO ₂ /MMBtu	5
	3 g CH ₄ /MMBtu	5
	.6 g N ₂ O/MMBtu	5
Kerosene	75.2 kg CO ₂ /MMBtu	5
	3 g CH ₄ /MMBtu	5
	.6 g N ₂ O/MMBtu	5
Wood	93.8 kg CO ₂ /MMBtu	5
	7.2 g CH ₄ /MMBtu	5
	3.6 g N ₂ O/MMBtu	5
Transportation		
<i>Vehicle Emission Rates</i>		
Truck	1,540.6 g CO ₂ e /mile	11
Passenger Vehicle	390.3 g CO ₂ e /mile	11
Bus	1,817.3 g CO ₂ e /mile	11
Agriculture		
<i>Enteric Fermentation</i>		
Dairy Cattle	90.79 kg CH ₄ /head	7
Beef Cattle	71.94 kg CH ₄ /head	7
Horses	18 kg CH ₄ /head	7

Table C-1
Greenhouse Gas Emission Factors and Constants

Source	Emission Factor	Reference
Mules and Asses	8.16 kg CH ₄ /head	7
Goats	5 kg CH ₄ /head	7
Sheep	8 kg CH ₄ /head	7
Swine	1.5 kg CH ₄ /head	7
<i>Manure Management - Methane</i>		
Dairy Cattle	71.87 kg CH ₄ /head	7
Beef Cattle	8.58 kg CH ₄ /head	7
Horses	3.29 kg CH ₄ /head	7
Mules and Asses	0.64 kg CH ₄ /head	7
Goats	0.4 kg CH ₄ /head	7
Sheep	0.71 kg CH ₄ /head	7
Chickens-Broilers	0.2 kg CH ₄ /head	7
Chickens-Layers	0.09 kg CH ₄ /head	7
Swine	13.63 kg CH ₄ /head	7
<i>Manure Management – Nitrous Oxide</i>		
Dairy Cattle	1.24 kg N ₂ O/head	7
Beef Cattle	0.43 N ₂ O/head	7
Horses	0.11 N ₂ O/head	7
Mules and Asses	0.07 N ₂ O/head	7
Goats	0.11 N ₂ O/head	7
Sheep	0.13 N ₂ O/head	7
Chickens-Broilers	0 N ₂ O/head	7
Chickens-Layers	0 N ₂ O/head	7
Swine	2.7 N ₂ O/head	7
<i>Direct and Indirect Nitrification</i>		
Volitization	.0005 kg N ₂ O-N/kg N	8
Leaching	0.011 kg N ₂ O-N/kg N	8
Liming	0.059 MT CO ₂ /MT Liming	9
Dolomite	0.064 MT CO ₂ /MT Dolomite	9
Urea	0.2 MTCO ₂ /MT Urea	10
Waste		
	0.47 Total Organic Degradable Carbon (TDOC)	
Newspaper		6
Office paper	0.396 TDOC	6
Corrugated boxes	0.449 TDOC	6
Coated paper	0.33 TDOC	6
Food	0.148 TDOC	6
Grass	0.133 TDOC	6
Leaves	0.291 TDOC	6
Branches	0.442 TDOC	6
Lumber	0.43 TDOC	6
Textiles	0.24 TDOC	6
Diapers	0.24 TDOC	6
Construction/Demolition	0.04 TDOC	6
Medical Waste	0.15 TDOC	6
Sludge/Manure	0.05 TDOC	6
Water	See Building Energy Emission Factors	1,2
Wastewater		
<i>Process Emissions</i>		
Wastewater Processing	3.2 g N ₂ O /person/year	6

Table C-1
Greenhouse Gas Emission Factors and Constants

Source	Emission Factor	Reference
<i>Effluent Discharge Fugitive Emissions</i>		
Total N-Load	0.026 kg N/person/day	6
N Uptake	0.005 kg N/kg BOD ₅	6
BOD ₅	0.09 kg BOD ₅ /person/day	6
Sewage Discharge	0.005 kg N ₂ O-N/kg sewage-N discharged	6
Molecular Weight Ratio	1.57	6
<i>Septic System Fugitive Emissions</i>		
BOD ₅	0.09 kg BOD ₅ /person/day	6
Bo	0.6 kg CH ₄ /kg BOD ₅	6
CH ₄ Correction Factor	0.22 (unitless)	6
<i>Energy-Related Emissions</i>		
Energy Intensity - Lagoon	2,000 kWh/million gal	6
Energy Intensity – Attached Growth	1,150 kWh/million gal	6
Energy Intensity – Activated Sludge	1,400 kWh/million gal	6
Energy Intensity – Nitrification/Denitrification	3,000 kWh/million gal	6
Collection Intensity	280 kWh/million gal	6
Per capita Water Use	100 gal/day/person	6
References:		
1	Edison International, 2023	
2	Imperial Irrigation District, 2023	
3	Desert Community Energy, 2022	
4	eGRID, 2022	
5	U.S. EPA Emissions Factor Hub, 2024	
6	ICLEI Community Protocol, 2013	
7	California Air Resources Board, 2021	
8	IPCC, 2019	
9	U.S. EPA GHG Inventory, 2024	
10	IPCC, 2006	
11	CARB, 2021	

Analysis Methods

As defined above, the community inventories include GHG emissions occurring within the boundaries of each jurisdiction in the region. The analysis methods for each emissions sector in the inventory are described in this section. The primary data sources for each sector are also provided.

- **Building Energy - Residential:** natural gas (direct emissions) and electricity consumption (indirect emissions) for the residential sector. Data provided by Southern California Edison, Southern California Gas, Imperial Irrigation District, and Desert Community Energy. Residential fuel use from sources not provided by utilities (i.e., propane, wood, fuel oil, and kerosene) was estimated using average household

consumption data from the U.S. Energy Information Administration; namely, the Residential Energy Consumption Survey, and State Energy Data System.

- **Building Energy - Non-Residential:** natural gas (direct emissions) and electricity consumption (indirect emissions) for commercial, industrial, and other non-residential land uses. Data provided by the utilities is noted above for Residential.
- **Light/Medium-Duty Vehicles:** emissions from combustion of fuel in light-duty and medium-duty passenger vehicles traveling in each jurisdiction. Vehicle miles traveled (VMT) data provided by Fehr and Peers using the Riverside County Model (RIVCOM).
- **Heavy-Duty Vehicles:** emissions from combustion of fuel in heavy-duty trucks traveling in each jurisdiction. VMT data provided by Fehr and Peers using RIVCOM.
- **Off-Road Equipment:** emissions from fuel combustion in off-road vehicles and equipment in each jurisdiction. Data provided by CARB's OFFROAD model for the entire County and apportioned to each jurisdiction using socioeconomic data.
- **Agriculture:** emissions resulting from enteric fermentation and manure management from livestock operations, fertilizer application to crops, and field burning of agricultural residues. Data provided by the US Department of Agriculture National Agricultural Statistics Services and other sources provided by Riverside County.
- **Solid Waste Management:** CH₄ emissions from waste decomposition, generated by each jurisdiction and deposited in landfills. Data provided by CalRecycle.
- **Wastewater Treatment:** fugitive emissions from domestic wastewater treatment. Data provided by wastewater treatment providers.
- **Water Transport, Distribution, and Treatment:** electricity consumption associated with water transport, distribution, and treatment. Water demand data per capita calculated from the individual Urban Water Management Plans applicable to each jurisdiction. Water energy intensity factors provided by various sources, as noted in **Table C-2**.

The inventory was conducted primarily using spreadsheet-based calculations informed by the methods established in the ICLEI Community Protocol. **Table C-2** presents the emissions sectors included in the community inventory, the data source for each emission sector, the methods for scaling the regional emissions to each jurisdiction where appropriate, and the methods for projecting emissions to 2030 and 2045. Population, housing, and employment estimates and forecasts for 2023, 2030, and 2045 are presented in the CCAP. These projections were used to forecast emissions in 2030 and 2045.

Table C-2
CVAG GHG Emissions Inventory Data Sources and Methods

Sector	Emission Sources	Source of Data	Scaling Methods	Projection Methods
Residential (Natural Gas and Electricity)	-Electricity consumption -Natural gas consumption -Other fuels (propane, wood, fuel oil, kerosene) -Fugitive emissions of SF ₆ from transport of electricity	-Electricity data from utilities (jurisdiction-level data) ^b -Natural gas data from utilities (jurisdiction-level data) ^c -SF ₆ factor from SoCal Edison and estimate from CARB inventory	None	Household growth factors
Non-Residential (Natural Gas and Electricity)	-Electricity consumption -Natural gas consumption - Fugitive emissions of SF ₆ from transport of electricity	-Electricity data from utilities (jurisdiction-level data) ^b -Natural Gas data from utilities (jurisdiction-level data) ^c -SF ₆ factor from SoCal Edison and estimate from CARB inventory	None	Employment growth factors
Light/Medium-Duty Vehicles	Light and medium-duty passenger vehicle fuel combustion	-Emission factors derived from CARB's EMFAC2021 model	None	-EMFAC2021 projections
Heavy-Duty Vehicles	Heavy-duty truck fuel combustion	-Emission factors derived from CARB's EMFAC2021 model	None	-EMFAC2021 projections
Off-road Equipment	Off-road vehicles and equipment fuel combustion	-Fuel consumption derived from CARB's OFFROAD model	Employment	-OFFROAD fuel consumption projections
Agricultural Emissions	Enteric fermentation and manure management from dairy and other agricultural operations, fertilizer application from farm operations	Riverside County Crop Report (2022); United States Department of Agriculture National Agricultural Statistics Service (2022) – scaled to Inland Empire based on assumptions from Riverside County Ag Commissioner (2024)	Quantity of dairy, cattle, and swine; grazing land use; agricultural soils; field burning of agricultural residues	-Linear projection of livestock population from 2022 to 2050 (livestock) -Annual increase of 2.3% per year based on USDA NASS fertilizer expense data -Wheat yield projections based on 2022 values.

Table C-2 CVAG GHG Emissions Inventory Data Sources and Methods				
Sector	Emission Sources	Source of Data	Scaling Methods	Projection Methods
Solid Waste Management	Methane emissions from landfilled waste	CalRecycle (jurisdiction-level data)	None	-Population growth forecasts (residential) -Employment growth forecasts (non-residential)
Wastewater Treatment	CH ₄ and N ₂ O emissions from the treatment of wastewater	-ICLEI Community Protocol -Population by city	Population	Population growth factors
Water Transport, Distribution, and Treatment	Indirect electricity emissions from water consumption	-Local Urban Water Management Plans (UWMPs)	Population	Population growth factors

Inventory Limitations and Recommendations

The subregional inventory captures GHG emissions from operations and activities of the 10 CVAG jurisdictions and serves as a baseline for emission reduction measures and as a starting point for future GHG emissions inventories. Future updates to the GHG emissions inventories presented in this report should be conducted annually to ensure that the inventory remains accurate and that data gaps are resolved in a timely manner. Annual updating also would enable efficient tracking of the effectiveness of any GHG reduction measures put in place to address these emission sources.

Although care was taken to ensure that data sets were as complete and accurate as possible, activities were appropriately attributed to the correct jurisdiction, and assumptions were based on reputable guidance, there are nevertheless a number of inventory limitations that have been identified. These limitations are discussed in the sections that follow.

Data Activity Gaps and Other Limitations

Although considerable efforts were made to obtain activity data from 2023, in some cases these data were unavailable and data from another year were substituted. One example of this limitation is for the agriculture sector, where data for agricultural soils, urea and liming, and cattle population was only available for 2022. As such, input activity data for 2022 was used as a proxy for 2023 data. Additional data gaps and limitations at the sector-level are discussed in this section.

Building Energy

In some cases, data was not available for the building energy sector. Most notably, some electricity and natural consumption data for some jurisdictions were not available because utilities

in California are subject to privacy rules,¹ which dictate that the utilities cannot disclose consumption data if certain criteria are not met.

Very large consumers of energy are one example of a privacy restrictions that the utilities must adhere to, and thus some large consumers of electricity and natural gas could not be included in the utility data. With respect to electricity, datasets for Blythe, Cathedral City, Desert Hot Springs, Palm Desert, Palm Springs, and Rancho Mirage had data that was omitted due to the privacy rules. For a number jurisdictions, were omitted but were aggregated into broader categories to provide more anonymity. For example, if industrial electricity consumption did not meet the privacy criteria, SCE combined the agricultural data with the commercial data and only provided the sum of these categories. For this reason, the non-residential energy emissions in the inventories have been grouped into one category rather than as sub-categories, such as commercial or industrial.

For natural gas, no datasets from Southern California Gas Company had data omitted due to the privacy rules. In one instance, a jurisdiction did not submit its natural gas data; consequently, publicly available data by zip code was utilized. However, it did not contain data for non-residential sectors.

On-Road Transportation

On-road transportation VMT data for passenger vehicles and trucks was readily available. Note that the inventory could be improved with the addition of public transportation (i.e., bus) emissions. However, bus VMT is difficult to track and model given that transit agencies often operate in multiple jurisdictions and attribution of VMT is challenging.

VMT for passenger vehicles and trucks was annualized using a standard factor of 321 days based on seasonality of traffic patterns specific to the CVAG region. The population of the region fluctuates greatly between the summer and winter months and results in swings in vehicle activity. This factor was provided by Fehr & Peers and was the most accurate means of annualizing VMT at the time. However, there may be a more accurate way of measuring and calculating annual VMT by jurisdiction.

Agriculture

The development of the agricultural inventory for the CVAG jurisdictions faced several data activity gaps and methodological limitations, primarily due to the lack of localized agricultural production data. To estimate emissions, a GIS analysis was used to determine the geographic extent of agricultural land within ten city boundaries. This land area was then used as a proxy to scale agricultural activity data from Coachella and Palo Verde Valleys to each city. However,

¹ The privacy rules were adopted by the California Public Utilities Commission (CPUC) in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 rule requires that any aggregated information provided by the utilities must be made up of at least 15 customers and a single customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data have been screened once already using the 15/15 Rule, the customer be dropped from the information provided.

land area is not a perfect proxy for agricultural activity, as production is not uniformly distributed across space. Despite this, it was deemed the most feasible approach in collaboration with local experts. Additionally, livestock population data were only available at the county level, requiring assumptions and expert input to estimate distributions within the CVAG jurisdictions. Fertilizer use, liming, and urea application data were also extrapolated from state-level sources using surrogate indicators like expense trends. Field burning estimates were limited to wheat due to the absence of yield data for other crops. These constraints highlight the need for more granular, city-level agricultural data to improve the accuracy of future inventories.

Water

The water emissions inventory used several assumptions for estimating water and electricity use by jurisdiction. Water and electricity use was extracted from Urban Water Management Plans (UWMPs) by water districts serving the region. The water and electricity data were then apportioned to the cities using jurisdiction population data and water district service population. In some instances, it was difficult to identify which water districts served each jurisdiction. Furthermore, the water data originated from a wide range of sources and UWMPs, which may have methodological or reporting differences between them.

Wastewater

Wastewater emissions are estimated using ICLEI's Community Protocol. The Community Protocol includes a variety of methods based on how much is known about the wastewater system emissions being estimated. Given the large geographic scope of the project, specific wastewater system data was unavailable or unrealistic to obtain. Therefore, the emissions are based on a methodology that used population served as an input. This may have produced estimated with a lower resolution results than if wastewater system-specific information was used.

High Global Warming Potential Gases

Emissions from the use of substitutes for ozone-depleting substances (ODS) (primarily hydrofluorocarbons [HFCs], and perfluorocarbons [PFCs])² were not included in the inventories. These substances are high GWP gases but are not specifically recommended for quantification in regional inventories. Quantification of these emissions is based on statewide emissions factors, which include a diverse set of possible sources; thus, scaling those statewide-based emissions to the regional- or local-scale likely introduces considerable uncertainty. Additionally, local governments have limited jurisdictional control or influence over these sources of emissions.

Business-as-Usual Forecasts

The BAU emissions forecasts for 2030 and 2045 are based on growth factors that represent the most appropriate data available for each sector. For example, future energy use emissions are estimated based on projected population, employment, and housing growth. Where possible, BAU projections were made using the best available information and estimates provided by

² Emissions of HFCs and PFCs occur from their use in refrigeration and air conditioning systems. These high GWP compounds were phased in as ODS substitutes. The majority of anthropogenic high GWP GHGs are SF₆, HFCs, and PFCs.

jurisdiction staff and experts on individual sectors. For many sectors, the projections of emissions were based on the future population estimates in 2030 and 2045 for the jurisdictions using data provided by RIVCOM or California's Department of Finance. This method assumes that emissions will remain proportionate to the current population, which may not be the case. For example, per capita energy consumption may change over time as consumer habits and technologies change. For other sectors, rather than population, BAU estimates were made based on employment levels, which requires a similar assumption regarding emissions remaining proportionate to current employment levels.

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.³

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 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

³ SBCTA. "San Bernardino County Regional Greenhouse Gas Reduction Plan." SBC, March 2021. <https://www.gosbcta.com/plan/regional-greenhouse-gas-reduction-plan/>.

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.⁴

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 Governments for Sustainability USA (ICLEI).⁵ 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

4 WRCOG, 2022. 2017 WRCOG Subregional Climate Action Plan Update. Available at: <https://wrcog.us/DocumentCenter/View/9987/Climate-Action-Plan-Toolkit>.

5 ICLEI, 2019. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2. Available at: <https://iclei.usa.org/us-community-protocol/>.

Subregional CAP 2017 inventories were completed in Excel workbooks, while the 2010 baseline emissions were calculated using ICLEI's Clean Air & Climate Protection Software (CACAP).

GHG Reduction Measures Methodology

This section provides an overview of the calculations and assumptions used to quantify the GHG emissions reductions for each of the GHG reduction measures in the CCAP. For each measure, there will be description of the measure, key measure assumptions, and the methods for calculating the anticipated GHG reduction for 2030 and 2045.

As an introduction to the measure details, this section begins with an overview of the general GHG quantification methods by emissions sector.

Overview of GHG Methods

The quantification of GHG reductions was based on guidance provided by the California Air Pollution Control Officers Association, other reference sources (such as the U.S. EPA), and professional experience obtained from preparing climate action plans for other jurisdictions in California. The majority of calculations were performed using standard factors and reference, rather than performing specific analysis of individual technologies. The following sections provide an overview of general calculation methods by emissions sector.

To avoid double counting emissions savings achieved by state programs, emissions reductions attributed to the candidate measures subtract reductions achieved through the relevant state measures first. Likewise, emissions reductions attributed to certain candidate measures subtract reductions achieved by overlapping local measures. By removing overlapping reductions, one can combine GHG reduction strategies to determine the cumulative effect of several measures without double counting measure effectiveness.

State Measures

The CCAP includes emissions benefits from ten statewide initiatives. These State measures span multiple emission sectors, but are primarily targeted at the building energy and transportation sectors. Emissions reductions achieved by these measures were apportioned to the city-level using statewide estimates of measure effectiveness and sector-specific information. For example, the California Air Resources Board (CARB) Senate Bill 350 requires a doubling of energy efficiency savings in the state by 2030. GHG reductions achieved by Senate Bill 350 within the Partnership cities were therefore quantified by determining the electricity and natural gas savings target in 2030 required by each jurisdiction to comply with Senate Bill 350 and applying utility-specific electricity emission factors and natural gas emission factors to each City's energy savings. It is important to note that while the Partnership jurisdictions will achieve emissions reductions as a result of State programs, implementing State measures does not require local action.

Regional Measures

The CCAP includes emissions benefits from two regional measures that are focused on the on road transportation and building energy sectors. Specifically, the on road transportation regional measure encourages the expansion of electric vehicle (EV) charging infrastructure. The building energy measure encourages energy efficiency and electrification of municipal and residential buildings. The methodology and key assumptions for these measures are described in more detail below.

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:

$$(\text{\# of chargers operational per year} \times \text{\# of charging sessions per day}) / (\text{Grid Loss Factor}) \times \text{days per year}$$

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).⁶ 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) Tool⁷ to project future year emission factors considering the State's Renewables Portfolio Standard (RPS) requirements for utilities to procure 60 percent renewable energy by 2030 and 100 percent renewable energy by 2045.⁸ 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

6 CARB, 2023. Electrify America Reports. Available at: <https://ww2.arb.ca.gov/resources/documents/electrify-america-reports>.

7 EPA, eGRID. Available at: <https://www.epa.gov/egrid>.

8 CARB, Renewables Portfolio Standard. Available at: <https://ww2.arb.ca.gov/our-work/programs/renewables-portfolio-standard>.

kWh per mile).⁹ 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.¹⁰ ¹¹ 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.¹² Electricity costs per kWh and charging fees were estimated using information from CARB.¹³ Energy demand and fixed charges were provided by the Energy Coalition.¹⁴

Building Decarbonization

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.
- 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.

⁹ 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.

¹⁰ CARB, EMFAC2021. Available at: <https://arb.ca.gov/emfac/emissions-inventory>.

¹¹ 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.

¹² ChargerHelp! Correspondence with Josh Lee, SBCOG on February 15, 2024.

¹³ CARB, Electric Car Charging Overview. Available at: <https://driveclean.ca.gov/electric-car-charging>.

¹⁴ The Energy Coalition, 2024. Inland Empire Electric Vehicle Infrastructure Deployment Proposed Program Guide.

- 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.

Table C-3 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 Web Tool REopt Energy Integration & Optimization NREL		

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 theC (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.

Table C-4 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

Table C-5 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

Table C-6
Manufactured Homes

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 CO₂ using conversion factors from Southern California Edison (1 kWh=0.000232 MTCO₂; 1 therm=0.005321 MTCO₂). 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.

Local Measures

This section describes the methods and assumptions used for local GHG reduction measures for CVAG by emissions sector. SBCOG's GHG reduction measure quantification methodology for local measures is in its 2021 Reduction Plan, and WRCOG's is in the 2019 Climate Action Plan.

Building Energy

Energy-1: Building Electrification

Measure Description

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

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will incentivize the electrification of existing and new residential and commercial buildings. To calculate the reductions from electrification, the following assumptions were used:
 - The participation rate applies to the total natural gas consumption for existing and new residential and commercial buildings. For example, for a participation rate of 25% for new commercial buildings, 25% of natural gas consumption within a city associated with new commercial buildings will be converted to electricity.
 - Fully electrified buildings consume 0 therms of natural gas

Energy-1: Building Electrification

- No increase in energy intensity from switching from natural gas to electricity; energy use can be converted from therms and kWh to btu to calculate electricity use replacing natural gas use.

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing residential and commercial buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Energy consumption for new buildings was estimated by subtracting the energy consumption associated with existing residential and commercial facilities in 2023 from projected energy consumption in 2030 and 2045.

Natural gas consumption reductions were then estimated by multiplying the existing and new building natural gas consumption by the penetration rates determined by participating jurisdictions. Increased electricity used to offset the reductions in natural gas consumption were estimated by converting the natural gas consumption reductions to btu, then to kWh. GHG emissions reductions were quantified by multiplying the natural gas consumption reductions (and electricity use increases) for each building type by the appropriate utility emission factors.

Energy-2: LED Bulbs and Fixtures

Measure Description

Replace interior and exterior incandescent, compact fluorescent, halogen, and T12 linear fluorescent bulbs.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will incentivize the replacement of interior and exterior incandescent, compact fluorescent, halogen, and T12 linear fluorescent bulbs for more energy efficient LED bulbs. To calculate the reductions from electrification, the following assumptions were used:
 - Lighting is 6% of residential electricity use and 10% of commercial electricity use (US EIA, 2022c) (US EIA, 2022b)
 - California households using 50% or more LED bulbs in 2020 is 60% (US EIA, 2022c) . Beginning in 2025, California will eliminate the sale of most incandescent, halogen, and fluorescent products. It is assumed that in 2030 and 2045 the percentage of households with 50% or more LED indoor bulbs will be 95% and 99% respectively.
 - Commercial properties using 50% or more LED bulbs in 2018 were 44% (US EIA, 2022b). Beginning in 2025, California will eliminate the sale of most incandescent, halogen, and fluorescent products. It is assumed that in 2030 and 2045 the percentage of commercial buildings with 50% or more LED indoor bulbs will be 85% and 95% respectively.

Energy-2: LED Bulbs and Fixtures

- It is estimated that LED lights have a 75% electricity savings per light (DOE, n.d.).

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing residential and commercial buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Energy consumption for new buildings was estimated by subtracting the energy consumption associated with existing residential and commercial facilities in 2023 from projected energy consumption in 2030.

Energy consumption attributed to LED and non-LED lighting was calculated by multiplying the assumed LED use rate and efficiency by total lighting energy use. This result was then subtracted from the total lighting energy use to determine the non-LED lighting total.

GHG emissions reductions were quantified by multiplying the energy use of lighting for each building type by the appropriate utility emission factors.

Energy-3: Smart Thermostat

Measure Description

Install occupant controlled smart thermostats for buildings with central heating and cooling systems.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will incentivize the installation of smart thermostats in existing and new residential and commercial buildings. To calculate the reductions from electrification, the following assumptions were used:
 - The average kWh savings for residential buildings is 87.5 per smart thermostat installed (California Electric Technical Reference Manual [CAeTRM], n.d.).
 - The average kWh savings for commercial buildings is 89.9 per smart thermostat installed (CAeTRM, n.d.)
 - The average therm savings per smart thermostat is 8% (ENERGY STAR, n.d.-c).
 - Assumed that 75% of homes did not have smart thermostats (CPUC, 2024).
 - Assumes that 30% of homes will participate in 2030 and 10% will participate in 2045.

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing residential and commercial buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Energy-3: Smart Thermostat

Energy consumption for buildings without smart thermostats was determined to then attribute the percent of building energy consumption from heating and cooling systems.

Energy consumption reductions (natural gas and electricity) were then estimated by multiplying the participating existing and new buildings without smart thermostats by the kWh savings and therm savings per smart thermostat installed.

GHG emissions reductions were quantified by multiplying the energy consumption reductions for each building type by the appropriate utility emission factors.

Energy-4: Appliance Electrification Upgrades

Measure Description

Replace and install inefficient electric appliances with Energy Star appliances.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will encourage the replacement of inefficient electric appliance with Energy Star Appliances in existing and in existing and new residential and commercial buildings. To calculate the reductions from appliance upgrades the following assumptions were used:
 - There is approximately 1 unit of the following appliances per household:
 - Refrigerator
 - Uses 15% of single-family home electricity (CalEEMod, n.d.)
 - Uses 23% of multi-family home electricity (CalEEMod, n.d.)
 - Energy Star refrigerators have a 9% efficiency rate (CalEEMod, n.d.)
 - Washing Machine
 - Uses 1% of single-family home electricity (CalEEMod, n.d.)
 - Uses 0.8% of multi-family home electricity (CalEEMod, n.d.)
 - Energy Star washing machines have a 25% efficiency rate (CalEEMod, n.d.)
 - Dishwasher
 - Uses 1% of single-family home electricity (CalEEMod, n.d.)
 - Uses 0.8% of multi-family home electricity (CalEEMod, n.d.)
 - Energy Star dishwashers have a 12% efficiency rate (CalEEMod, n.d.)
 - Ceiling Fan
 - Uses 1.1% of single-family home electricity (CalEEMod, n.d.)
 - Uses 1.8% of multi-family home electricity (CalEEMod, n.d.)
 - Energy Star ceiling fans have a 60% efficiency rate (CalEEMod, n.d.)
 - 15% of single family and multi-family homes will participate in 2030
 - 25% of single family and multi-family homes will participate in 2045

GHG Analysis

BAU Energy Use

Energy-4: Appliance Electrification Upgrades

The GHG inventory quantified energy consumption associated with existing buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Energy consumption of inefficient appliances were then estimated based on the assumption of the number of inefficient appliances in residential buildings.

Energy savings were calculated and GHG emissions reductions were quantified by multiplying energy consumption reductions for residential homes by the appropriate utility emission factors.

Energy-5: Solar Window Film

Measure Description

Install solar window film certified by the National Fenestration Rating Council on single and multifamily homes and commercial buildings.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will encourage the use of solar window film in existing and in existing and new residential and commercial buildings. To calculate the reductions from solar window film the following assumptions were used:
 - Solar window film will result in a 30 percent reduction in cooling costs (International Window Film Association, 2014).
 - 72% of single-family homes have AC (EIA, 2022)
 - The average energy consumption of AC per household is 13% (California Energy Commission, 2021)
 - 75% of multifamily homes have AC (EIA, 2022a)
 - 76% of commercial buildings have AC (EIA, 2022b)
 - The average energy consumption of AC in commercial buildings is 10% (EIA, 2018)
 - 15% of all residential homes and commercial buildings will participate in this measure in 2030
 - 25% of all residential homes and commercial buildings will participate in this measure in 2045

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

The amount of energy used for cooling buildings was determined. The penetration rate was then applied to estimate energy savings for single-family, multi-family, and commercial buildings.

Energy savings were multiplied by the appropriate utility emission factors for each building type to determine GHG emissions reductions.

Energy-6: Cool Roofs

Measure Description

Install and retrofit roofs with cool roofs to reduce urban heat island effects and lower energy consumption.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will encourage retrofitting roofs with cool roofs in existing and in existing and new residential and commercial buildings. To calculate the reductions from cool roofs the following assumptions were used:
 - Average roof space per multifamily home: 86,667 sq.ft. (WRCOG, 2019)
 - Average roof space of single-family homes: 1,350 sq.ft. (WRCOG, 2019)
 - Average roof space for commercial buildings: 21,602 sq. ft. (WRCOG, 2019)
 - 95% of roof space will be modified to a cool roof
 - Energy savings were estimated using the Lawrence Berkley National Laboratory Cool Surfaces Savings Tool
 - 15% of residential and commercial buildings participate in 2030
 - 35% of residential and commercial buildings participate in 2045

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Multiplying the area of sq. ft. of cool roof installed on residential and commercial buildings by the electricity and gas heating savings provided by the LBNL Cool Surfaces Savings Tool.

Energy savings were multiplied by the appropriate utility emission factors for each building type to determine GHG emissions reductions.

Energy-7: Roofline Insulation and Attic Encapsulation

Measure Description

Insulate roof rafters to improve energy efficiency in existing homes.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will support roofline insulation and attic encapsulation in existing single-family homes. To calculate the reductions from roofline insulation and attic encapsulation the following assumptions were used:
 - 78% of existing homes have inadequate insulation (Insulation Institute, 2024)
 - 14% energy savings from insulation (Energy Star, n.d.)
 - 10% of single-family homes participate in 2030
 - 20% of single-family homes participate in 2045

GHG Analysis

Energy-7: Roofline Insulation and Attic Encapsulation

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

Determine the number of homes without roofline insulation and calculate the total energy savings (kWh and therms) with roofline insulation.

Energy savings were multiplied by the appropriate utility emission factors for each building type to determine GHG emissions reductions.

Energy-8: HVAC Maintenance Program

Measure Description

Create an HVAC tune-up program to ensure that HVAC systems are operating at their maximum efficiency level.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Participating jurisdictions will support HVAC maintenance programs for existing and new residential and commercial buildings. To calculate the reductions from roofline insulation and attic encapsulation the following assumptions were used:
 - There are estimates that HVAC tune-ups can improve system efficiency by up to 15% (Energy Star, n.d.)

GHG Analysis

BAU Energy Use

The GHG inventory quantified energy consumption associated with existing buildings in 2023.

Emissions Reductions

Energy reductions achieved by overlapping State measures were first removed to obtain energy consumption after the implementation of state measures.

By determining the amount of energy consumption used by residential and HVAC systems, the resulting number was multiplied by the participation rate and energy savings rate for electricity and natural gas.

Energy savings were then multiplied by the appropriate utility emission factors for each building type to determine GHG emissions reductions.

Energy-9: Solar Installations for New Commercial and Industrial Development

Measure Description

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

Assumptions

The following assumptions were considered in the evaluation of this measure:

- This measure only affects new nonresidential buildings built after 2023
- Jurisdictions participating in this measure will encourage 15% of new development energy requirements to be supplied with on or off-site renewable power by 2030, and 30% by 2045

Energy-9: Solar Installations for New Commercial and Industrial Development

- The energy generated by solar PV is carbon neutral
- Annual kWh generation of solar systems for 3, 5, and 10 kW systems for the Mojave and South Coast from CAPCOA were used.
- The amount of electricity generated by the panels will offset the electricity provided by the utilities.

GHG Analysis

Utilizing electricity generated by solar PV panels displaces electricity demand that would ordinarily be provided by the utilities. Although SCE purchases a substantial amount of energy from renewable sources, electricity supplied by SCE still represents a source of indirect GHG emissions. Carbon neutral sources, such as solar, do not emit GHGs.

BAU Electricity Emissions

The GHG Inventory quantified electricity emissions associated with existing commercial facilities in 2016. The 2016 values were projected to 2030 using employment data in order to determine electricity use and emissions for all new commercial buildings built from 2017 to 2030.

Emissions Reductions

Energy reductions associated with other state and local measures were subtracted from the energy used by all new nonresidential buildings built from 2023 to 2030 and 2023 to 2045. This was done in order to determine the energy used by new buildings after the implementation of preceding measures, before installation of solar PV.

The remaining quantity of electricity used by new nonresidential buildings was then multiplied by the percent energy requirements for new development supplied with solar power penetration rate, as determined by the participating jurisdictions.

The resulting number of kWh was assumed to be provided by solar PV under this strategy. The amount of solar PV in kW was then determined by dividing this kWh figure by 1,678 kWh per kW of solar PV (CAPCOA, 2019).

Carbon neutral sources do not emit GHGs. The kWh affected by this measure would result in a 100% reduction in emissions, relative to BAU conditions.

GHG emissions reductions achieved by this strategy were quantified by multiplying the resulting solar electricity production for each city by the appropriate utility emission factors.

Energy-10: On-Site Solar Energy for New and Existing Warehouse Space**Measure Description**

Promote and incentivize solar installations in new and existing warehouse spaces.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- The energy generated by PV is carbon neutral
- Jurisdictions participating in this measure will reach a 40% warehouse roof PV installation goal in 2030.
- Annual kWh generation of solar systems for 3, 5, and 10 kW systems for the Mojave and South Coast from CAPCOA were used.
- The amount of electricity generated by the panels will offset the electricity provided by the utilities.

Energy-10: On-Site Solar Energy for New and Existing Warehouse Space

GHG Analysis

Utilizing electricity generated by solar PV panels displaces electricity demand that would ordinarily be provided by the utilities. Although SCE purchases a substantial amount of energy from renewable sources, electricity supplied by SCE still represents a source of indirect GHG emissions. Carbon neutral sources, such solar, do not emit GHGs (California Air Pollution Control Officers Association, 2024).

Emissions Reductions

The total amount of warehouse building square footage in each Partnership jurisdiction was multiplied by the penetration rate to determine the total square footage of warehouses installing solar under this measure. The participating square footage was then multiplied by 15 watts per square foot of solar PV to determine the total power output in kW of solar (BEST Contracting Services, 2010). The kW value was then multiplied by the average kWh per kW of solar PV to determine the total annual kWh of electricity produced by the panels (CAPCOA, 2024). Carbon neutral sources do not emit GHGs. The kWh affected by this measure would therefore result in a 100% reduction in emissions, relative to BAU conditions. GHG emissions reductions achieved by this strategy were quantified by multiplying the resulting solar electricity production for each city by the appropriate utility emission factors.

Energy-11: Solar Installations for Existing Homes

Measure Description

Increase solar installations on existing single-family homes.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- This measure only affects existing single-family homes (those built before 2023).
- The energy generated by solar PV is carbon neutral. Annual kWh generation of solar systems for 3, 5, and 10 kW systems for the Mojave and South Coast from CAPCOA were used.
- The amount of electricity generated by the panels will offset the electricity provided by the utilities.

GHG Analysis

Utilizing electricity generated by solar photovoltaic panels displaces electricity demand that would ordinarily be provided by the utilities. Although SCE purchases a substantial amount of energy from renewable sources, electricity supplied by SCE still represents a source of indirect GHG emissions. Carbon neutral sources, such solar, do not emit GHGs.

Emissions Reductions

The number of single-family homes in each city in 2023 (those that are considered existing) was multiplied by the percent penetration rate as specified by each city to determine the number of new homes installing solar PV. This number was then multiplied by average annual generation, which is the annual amount of electricity provided by the average solar system in the county (CAPCOA, 2019). This determines the total amount of renewable energy provided by the panels and offset from the utilities.

Carbon neutral sources do not emit GHGs. The kWh affected by this measure would therefore result in a 100% reduction in emissions, relative to BAU conditions. GHG emissions

Energy-11: Solar Installations for Existing Homes

reductions achieved by this strategy were quantified by multiplying the resulting solar electricity production for each city by the appropriate utility emission factors.

Energy-12: Solar Installations for Existing Commercial and Industrial Buildings

Measure Description

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

Assumptions

The following assumptions were considered in the evaluation of this measure:

- This measure only affects existing commercial and industrial buildings (those built before 2023).
- The energy generated by solar PV is carbon neutral. Annual kWh generation of solar systems for 3, 5, and 10 kW systems for the Mojave and South Coast from CAPCOA were used.

The amount of electricity generated by the panels will offset electricity provided by the utilities.

GHG Analysis

Utilizing electricity generated by solar PV panels displaces electricity demand that would ordinarily be provided by the utilities. Although SCE purchases a substantial amount of energy from renewable sources, electricity supplied by SCE still represents a source of indirect GHG emissions. Carbon neutral sources, such solar, do not emit GHGs.

BAU Electricity Emissions

The GHG Inventory quantified electricity emissions associated with existing commercial facilities in 2023. The 2023 values were projected to 2030 and 2045 using employment data in order to determine electricity use and emissions for all existing commercial buildings built before 2030 and 2045.

Emissions Reductions

Energy reductions associated with other state and local measures were subtracted from the energy used by all existing nonresidential buildings built before 2016. This was done in order to determine the energy used by existing non-residential buildings after the implementation of preceding measures, before installation of solar PV.

The remaining quantity of electricity used by existing nonresidential buildings was then multiplied by the percent of existing commercial/industrial buildings that will install solar power under this measure, as determined by the participating cities. This new kWh value was then multiplied by 15%, which is the amount of each existing building's energy demand that will be supplied by the solar PV panels.

Carbon neutral sources do not emit GHGs. The kWh affected by this measure would therefore result in a 100% reduction in emissions, relative to BAU conditions. GHG emissions reductions achieved by this strategy were quantified by multiplying the resulting solar electricity production for each city by the appropriate utility emission factors.

On-Road Transportation

On-road transportation measures were divided into tiers 1, 2, and 3 to reflect different categories of mitigation measures. Tier 1 represents measures regarding general land use and infrastructure improvements. Tier 1 measures are focused on longer-term changes that build the physical

framework for long-term mode shift. Tier 2 represents more focused measures aimed at commute trip reduction and public transit improvements. Tier 2 measures are the most immediate and scalable VMT reduction measures that alter how people travel and commute to work. Tier 3 represents measures aimed at pricing tools and incentives. Tier 3 measures offer targeted incentives and tools where travel alternatives are already implemented. These tiers are additive to each other – Tiers 2 and 3 measures are chosen by jurisdictions to be implemented additional to Tier 1 measures.

All VMT reductions for each tier were calculated using a mathematical procedure called multiplicative dampening, which combines VMT reduction effects from multiple measures. Each consecutive measure's percent reduction is applied to VMT remaining after the last measure to avoid the overestimation of reductions when multiple measures are implemented.

Tier 1 On-Road 3: Light Duty Electric Vehicle Infrastructure

Measure Description

This measure supports the regional uptake of zero emission vehicles (ZEVs) through expansion of supporting infrastructure, including EV charging and hydrogen refueling stations.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Assumed to be included under State measures, specifically AB 1493 (Pavley I and II) and Advanced Clean Cars II
- Assumes State regulatory actions are locally implemented by target dates

GHG Analysis

Quantified as a State measure using forecasted vehicle VMT and fuel mix data obtained from CARB and adjusting EMFAC outputs with correction factors. The correction factors capture the increase in electric vehicle adoption through Advanced Clean Cars II and are reflected in annual weighted average emission factor (expressed in grams CO₂e per mile) originally derived from EMFAC2021.

Tier 1 On-Road 4: Pedestrian Infrastructure Improvements

Measure Description

Fill gaps (sidewalk construction, crosswalks, curb ramps, etc.) identified in pedestrian network equaling to 1% of total street network length

Assumptions

The following assumptions were considered in the evaluation of this measure:

- A -0.05 elasticity of VMT with respect to the ratio of sidewalks to streets from CAPCOA was used.
- Assumes that all participating jurisdictions have at least 1% of street network not covered by sidewalk and will improve at least 1%.

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions resulting from pedestrian infrastructure improvements were estimated by pulling street network miles per jurisdiction according to centerline data. Street network miles per jurisdiction were multiplied by 1% to determine assumed pedestrian improvement length. Assumed pedestrian improvement length was divided by street network miles per jurisdiction and multiplied by VMT and elasticity of VMT with respect to sidewalk to street ratio to estimate VMT reduction (CAPCOA, 2024). VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Tier 1 On-Road 5: Bicycle and Micromobility Infrastructure Improvements

Measure Description

Complete construction of 50% of the participating jurisdictions Active Transportation Plan planned bikeway network. Implement e-bikeshare or scootershare program where 5% of residents in participating jurisdictions have access.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Assumes bicycle and vehicle mode share per jurisdiction based on 2023 ACS data
- This measure does not account for indirect emissions from charging e-bikes or scooters
- This measure does not account for emissions from vehicle travel of employees picking up and dropping off e-bikes or scooters
- Assumes that there is currently no e-bikeshare or scootershare implemented in CVAG
- From CAPCOA, 2024:
 - Assumes an average one-way bicycle trip length of 2.2 miles and one-way e-bikeshare trip of 2.1 miles
 - Assumes an average one-way vehicle trip length of 11.7 miles
 - A 0.25 elasticity of bike commuters with respect to bikeway miles per 10,000 population was used
 - Assumes 0.021 daily e-bikeshare trips per person
 - Assumes 2.7 daily vehicle trips per person
 - Assumes 38.5% vehicle to e-bikeshare substitution rate and 38.5% vehicle to scootershare substitution rate

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions as a result of expanding bikeway miles were estimated by using the existing and planned bikeway length detailed in the CVAG ATP. The percent increase in bikeway miles under the assumption of 50% completion was multiplied by bicycle-commute elasticity, bicycle mode share, and average one-way bicycle trip length, and divided by vehicle mode share and average vehicle one-way trip length to determine percent reduction in VMT (CAPCOA, 2024). This value was multiplied by VMT to estimate VMT reduction.

VMT reductions as a result of implementing e-bikeshare or scootershare programs were estimated assuming 0% access to such programs increased to 5%. The difference in access was multiplied by daily e-bikeshare trips per person, the vehicle-trip substitution rate, and average e-bikeshare one-way trip length, then divided by daily vehicle trips per person and average one-way vehicle trip length to determine percent reduction in VMT (CAPCOA, 2024). This value was multiplied by VMT to estimate VMT reduction.

VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Tier 2 On-Road 7: Increase Transit Service and Frequency

Measure Description

Increase transit network coverage by 20% in participating jurisdictions. Implement a 20% increase in transit service frequency on all routes in participating jurisdictions.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- From CAPCOA, 2024:
 - Assumes a 1.37% of transit mode share
 - A 0.7 elasticity of transit with respect to service miles was used
 - A 0.5 elasticity of transit ridership with respect to frequency was used
 - Assumes a 57.8% statewide mode shift factor
 - Assumes a 96.9% auto mode share

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions resulting from expanding transit network coverage were estimated by pulling existing transit service mile data and assuming a 20% percent increase in service miles. The percent increase was multiplied by transit mode share, elasticity of transit demand to service, statewide mode-shift factor, and VMT to derive VMT reduction (CAPCOA, 2024).

VMT reductions resulting from increasing transit service frequency were estimated by assuming a 20% percent increase in transit frequency on all routes. The percent increase was multiplied by transit mode share, elasticity of ridership to frequency, and statewide mode-shift factor, then divided by vehicle mode share and multiplied by VMT to estimate VMT reduction (CAPCOA, 2024).

VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Tier 2 On-Road 8: Transit-Oriented Development

Measure Description

Ensure that 30% of new developments are within ½ mile of transit facilities.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Assumes that 30% of new residents will be in a transit-oriented development
- From CAPCOA, 2024:
 - Assumes a 1.37% of transit mode share
 - Assumes a 4.9 ratio of transit mode share in transit-oriented development areas compared to existing transit mode share elsewhere
 - Assumes a 96.9% auto mode share

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions resulting from transit-oriented development were estimated by taking transit mode share, multiplying by the 4.9 transit-oriented development uplift factor to approximate transit share, then dividing by auto mode share to determine percent VMT reduction (CAPCOA, 2024). The percent VMT reduction was then multiplied by VMT per service population and 30% of projected new residents to determine VMT reduction. VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Tier 2 On-Road 9: Transportation Demand Management

Measure Description

Provide voluntary commute trip reduction programs, commute trip reduction marketing, rideshare programs, and subsidized transit passes to 10% of employees in participating

jurisdictions. Provide mandatory commute trip reduction programs for 5% of employees in participating jurisdictions. Provide enhanced end-of-trip bicycle facilities at all new workplaces. Aim for 0.5% of employees in participating jurisdictions to utilize a vanshare program. Deploy a carshare fleet allocating one car per 150 households and employees.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Assumes bicycle and vehicle commute mode share per jurisdiction based on 2023 ACS data
- Assumes 10% of employees will receive free transit passes
- From CAPCOA, 2024:
 - Assumes a 4% reduction in commute VMT from employees eligible for voluntary commute trip reduction programs, commute trip reduction marketing, and rideshare programs
 - Assumes a 26% reduction in vehicle mode share of employee commute trips for those in mandatory commute trip reduction programs
 - Assumes an average one-way vehicle commute trip of 18.6 miles and 42 miles for one-way vanpool commute trips
 - Assumes an average vanpool occupancy of 6.25 occupants
 - Assumes an average emission factor of employee vehicle of 307.5 g CO₂e per mile and 763.5 g CO₂e per mile for vanpools
 - Assumes a transit mode share of 1.12%
 - A -0.43 elasticity of transit boardings with respect to fare price is used
 - Assumes 50% of projected new commute transit trips would otherwise be made in a personal vehicle
 - Assumes a 4.86 bike mode adjustment factor
 - Assumes average one-way bicycle trip length of 2.2 miles and average one-way vehicle trip length of 11.7 miles
 - Assumed 68.2 VMT per day per vehicle avoided with a carshare program
 - Assumed 24.4 VMT per day per vehicle added with a carshare program

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions are combined multiplicatively, with each measure applying to remaining VMT after previous strategies to avoid double counting and reflecting diminishing returns. Because the aggregate reductions from voluntary and mandatory commute trip reduction programs are already credited to underlying measures of commute trip reduction marketing, rideshare, subsidized transit, and vanpool programs, the standalone reductions from voluntary and mandatory commute trip reduction programs were set to zero.

VMT reductions resulting from commute trip reduction and rideshare programs were estimated by assuming 10% of employees in participating jurisdiction will be eligible and multiplying by VMT and a 4% reduction in commute VMT from eligible employees (CAPCOA, 2024).

VMT reductions resulting from subsidized transit programs were estimated by assuming a 100% fare reduction and multiplying by elasticity of transit boardings with respect to price to estimate added transit use. This change was scaled by the 10% of eligible employees, transit mode share, and the share of new commute transit trips, then multiplied by VMT to estimate VMT reduction (CAPCOA, 2024).

VMT reductions resulting from enhanced end-of-trip facilities were estimated by applying the bike mode adjustment factor to bicycle commute share to estimate bike share change. The change was converted to displaced vehicle VMT by multiplying by average bicycle trip length and dividing by vehicle trip length and vehicle commute share to determine a percent VMT reduction (CAPCOA, 2024). The percent VMT reduction was converted to VMT reduction by multiplying by VMT and share of new workers compared to total workers to reflect implementation at new workplaces.

VMT reductions resulting from vanpool were estimated by assuming a goal of 0.5% participation rate of employees. The goal participation rate was used in conjunction with average commute lengths, vanpool occupancy, and emission factors to calculate per employee emissions. Per employee emissions were calculated by treating non-participants as driving their auto commute with the auto emission factor and participants with the vanpool emission factor split equally amongst the assumed occupancy. This was compared against a baseline in which all employees drive along with the auto emission factor, and the difference as a percent is used to derive a percent VMT reduction, which is then multiplied by VMT to estimate VMT reduction (CAPCOA, 2024).

VMT reductions resulting from carshare fleet implementation were estimated by multiplying the number of carshare vehicles by the net change in conventional VMT per vehicle and divided by baseline VMT, then multiplied by VMT to estimate VMT reduction (CAPCOA, 2024). VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Tier 3 On-Road 10: Parking Pricing and Limited Requirements

Measure Description

Provide employee parking cash-out for 10% of employees in participating jurisdictions. Implement community-based travel planning programs targeting 20% of residences in participating jurisdictions. Price on-street parking at high-demand or downtown areas in participating jurisdictions. Construct park-and-ride lots.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Assumes \$1 per hour parking price in areas with priced on-street parking
- Assumes 50% of parking will be at priced on-street spots with priced on-street parking
- Assumes 90% occupancy of park-and-ride lots.
- Assumes average Sunline trip length stays at 7.3 miles and average distance to bus stop for drivers stays at 4.4 miles
- Assumes average vehicle occupancy stays at 1.5 persons per car
- From CAPCOA, 2024:
 - Assumes a 12% reduction in employee commute VMT from implementation of employee parking cash-out.
 - Assumes 19% of targeting residences will participate in community-based travel planning programs
 - Assumes 12% vehicle trip reduction of residences participating in community-based travel planning programs
 - A -0.4 elasticity of parking demand with respect to price is used

GHG Analysis

BAU Forecast

The GHG Inventory quantified on-road emissions associated in 2023 using RIVCOM VMT for passenger vehicles and trucks. The 2023 values were projected to 2030 and 2045 to quantify emissions associated with on-road transportation for 2030 and 2045.

Emissions Reductions

VMT reductions resulting from implementing employee parking cash-out were estimated by assuming 10% employee eligibility and multiplying by VMT and percent reduction in employee commute VMT from parking cash-out (CAPCOA, 2024).

VMT reductions resulting from community-based travel planning were estimated by multiplying the share of residences targeted by the assumed participation rate, percent vehicle trip reduction of participating residences, and VMT (CAPCOA, 2024).

VMT reductions resulting from pricing on-street parking were estimated by multiplying the share of downtown VMT compared to total jurisdiction VMT by the percent increase in on-street parking price (capped at 100%), share of trips that park on-street, price elasticity of parking demand, and VMT (CAPCOA, 2024).

VMT reductions resulting from park-and-ride lot construction assumes that a park-and-ride lot with 1 space per 150 households in participating jurisdictions. This supply is multiplied by the assumed 90% parking occupancy and divided by average vehicle occupancy to estimate the usage by number of people. VMT reduction is estimated by multiplying the usage by the difference between average Sunline trip length and distance to bus stop, then multiplied by two to represent to-and-from trips.

VMT reductions were then multiplied by an annual weighted average emission factor (expressed in grams CO₂e per mile) derived from EMFAC2021 and converted to metric tons to estimate the GHG emissions reductions.

Off-Road Transportation

Off-Road-1: Electrify Construction Equipment

Measure Description

Electrify 25/50/75% of construction equipment (less than or equal to 120 hp) by 2030

Implementation Levels:

Low: 25%

Medium: 50%

High: 75%

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Equipment over 120 hp are not considered
- Fossil fueled vehicles are replaced by electric-powered alternatives

GHG Analysis

BAU Forecast

The GHG Inventory quantified off-road emissions associated with 2023. The 2023 values were projected to 2030 and 2045 using CARB's OFFROAD model and employment data in order to determine the fuel consumption and emissions associated with off-road equipment for 2030 and 2045.

Emissions Reductions

Off-road construction equipment emissions reductions were estimated by multiplying the diesel and gasoline fuel consumption for equipment less than or equal to 120 horsepower by the implementation level percentage chosen by each jurisdiction. The resultant reduction in fuel consumption was then multiplied by the appropriate emission factor to estimate GHG reductions. The fuel consumption reduction was assumed to be replaced by electric-powered equipment and was converted to electricity using a conversion factor. The resultant increase in electricity use was then multiplied by the applicable emission factor to estimate the GHG emissions resulting from electrified equipment. The electric-powered equipment reductions were subtracted from the GHG emissions reductions associated with the fuel switch from diesel- and gasoline-powered equipment to estimate the net GHG emissions reductions.

Off-Road-2: Electrify Lawn and Garden Equipment

Measure Description

Electrify 60/70/80% of construction equipment (less than or equal to 120 hp) by 2030

Implementation Levels:

Low: 60%

Medium: 70%

High: 80%

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Fossil fueled vehicles are replaced by electric-powered alternatives

GHG Analysis

BAU Forecast

The GHG Inventory quantified off-road emissions associated with 2023. The 2023 values were projected to 2030 and 2045 using CARB's OFFROAD model and employment data in order to determine the fuel consumption and emissions associated with off-road equipment for 2030 and 2045.

Emissions Reductions

Off-road lawn and garden equipment emissions reductions were estimated by multiplying the diesel and gasoline fuel consumption by the implementation level percentage chosen by each jurisdiction. The resultant reduction in fuel consumption was then multiplied by the appropriate emission factor to estimate GHG reductions. The fuel consumption reduction was assumed to be replaced by electric-powered equipment and was converted to electricity using a conversion factor. The resultant increase in electricity use was then multiplied by the applicable emission factor to estimate the GHG emissions resulting from electrified equipment. The electric-powered equipment reductions were subtracted from the GHG emissions reductions associated with the fuel switch from diesel- and gasoline-powered equipment to estimate the net GHG emissions reductions.

Solid Waste Management

Waste-1: SB1383 Short-Lived Climate Pollutants Organic Waste Recycling

Measure Description

Reduce methane pollution and other short-lived climate pollutants by reducing organic waste by 75 percent.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Although this measure is mandated by legislation, emissions reduction credits are attributed to individual jurisdictions since it is an unfunded mandate.
- Assumes that 75% of existing organic waste that is diverted to composting would have been landfilled otherwise
- Emissions reductions are due to avoided landfilling emissions

GHG Analysis

BAU Solid Waste Management

The GHG Inventory quantified waste emissions associated with existing waste management practices in 2023. The 2023 values were projected to 2030 and 2045 using population and employment data in order to determine the waste amount and emissions associated with waste for 2030 and 2045.

Emissions Reductions

Based on projected waste characterization data, total tonnage estimates for 2030 and 2045 were calculated to assess business-as-usual (BAU) emissions from organic waste. To estimate reductions, this tonnage was multiplied by 75%, representing the targeted decrease in organic waste sent to landfills. The remaining quantity was then allocated using appropriate emission factors for both landfilled and composted organic waste.

Waste-2: Construction and Demolition Waste

Measure Description

Waste-2: Construction and Demolition Waste

Adopt a construction and demolition waste recovery ordinance that meets or exceeds the CALGreen voluntary guidance of 65-75 percent reduction in nonhazardous waste.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- The BAU scenario assumes that all C&D waste is landfilled
- Assumes that participating cities will divert 75% C&D from landfills by 2025 and 80% by 2030

GHG Analysis

Emissions Reductions

Calculated BAU C&D waste landfill emissions by multiplying disposed tons by the relevant emission factor, then estimated avoided emissions assuming a 75-80% reduction for all materials.

Waste-3: Solid Waste Diversion

Measure Description

Adopt citywide waste goals to divert waste, support zero waste programs and education, and implement recycling and composting in multifamily buildings.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Accounts for the amount of residential mixed organics sent to the landfill after the implementation of Waste-1
- Emissions reductions are due to avoided landfilling emissions
- Assumes that the waste diversion rate rises incrementally from 0% to 80% from 2025 to 2045

GHG Analysis

Emissions Reductions

Waste reductions achieved by overlapping local measures were first removed to obtain waste emissions after the implementation of SB1383 and Waste-4. This was multiplied by the waste diversion rate and the appropriate emission factors were applied.

Determined the amount of recyclable waste per household and multiply by the waste diversion rate. Multiplied this result by the appropriate emissions factors. The two final emissions estimates were added to determine the emissions reduction potential of multifamily recycling and composting goals and programs.

Waste-4: Food Waste Diversion

Measure Description

Establish a food waste and organics diversion goal. Pilot a food share/food recovery program.

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Accounts for the amount of residential mixed organics sent to the landfill after the implementation of Waste-1
- Emissions reductions are due to avoided landfilling emissions

Waste-4: Food Waste Diversion

- Assumes that the food rescues programs diverts 30 percent of food waste away from landfill by 2030
- Assumes that 80% of food sent to the landfill is still edible (EPA, 2021)

GHG Analysis

Emissions Reductions

Calculated the metric tons of organic waste remaining after the implementation of Waste-1. Identified the portion of that waste that consisted of edible food and estimated how much could be rescued through the program. Applied the appropriate emissions factor to the final amount of rescued food to determine the total emissions reductions.

Agriculture

Agriculture-1: Tree Planting

Measure Description

Promote urban tree planting for shading and energy savings by establishing a city-wide tree planting goal.

Assumptions

The following assumptions were considered for the quantification of this measure:

- The annual energy savings of one mature tree is 177 kWh (CARB, 2023)
- The annual energy savings from planting one tree due to decreased heat island effect is 7 kWh (ICLEI Local Governments for Sustainability, 2010)
- Tree shading effects were not considered
- Carbon sequestration was not considered

GHG Analysis

The exact location of where the trees would be planted in each jurisdiction is not known at this point. Trees planted along transportation corridors and roadways, or in parks and open space areas, would not shade buildings (which can reduce summer cooling energy consumption). Therefore, to be conservative, tree shading effects were not considered for this measure. In addition, carbon sequestration benefits from new trees were not considered because the BAU inventories do not have a BAU assessment of carbon sequestration for each jurisdiction.

Emissions Reductions

Trees can also reduce the urban heat island effect through both shading and evapotranspiration. Thus, quantification of this measure focused on reduced urban heat island effect. The GHG benefits achieved from tree planting vary based on the species, age, and size of tree planted. The following steps were performed to calculate electricity savings associated with urban tree planting:

Electricity savings (kWh) = total number of adult shade trees planted by each jurisdiction in 2030/2045 × 177 kWh saved per tree per year + total number of non-shade trees planted by each jurisdiction in 2030/2045 × 7 kWh saved per tree per year due to decreased heat island effect only

GHG savings from electricity reductions were then calculated by multiplying the energy reductions by the appropriate utility emission factors.

Water

Water-1: Water Conservation

Measure Description

Reduce water use by 10/15/20% by 2030

Implementation Levels:

Low: 10%

Medium: 15%

High: 20%

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Energy use intensity (kWh/acre-foot) are averages for each jurisdiction

GHG Analysis

BAU Forecast

The GHG Inventory quantified water emissions associated with 2023. The 2023 values were projected to 2030 and 2045 using population data in order to determine the water use, electricity use, and emissions associated with water for 2030 and 2045.

Emissions Reductions

Emissions reductions from water conservation were calculated by forecasting total water use out to 2030/2045 for each jurisdiction. The total water use was multiplied by the jurisdiction-specific implementation percentage to estimate the water saved. The water saved was then multiplied by a jurisdiction-specific average energy use intensity (kWh/acre-foot) to estimate the electricity reductions in the target years. Energy use intensity is derived from local UWMPs. GHG emissions reductions were quantified by multiplying the electricity reductions by the appropriate utility emission factors.

Water-2: Recycled Water

Measure Description

Recycle 5/10/15% of water for reuse by 2030

Implementation Levels:

Low: 5%

Medium: 10%

High: 15%

Assumptions

The following assumptions were considered in the evaluation of this measure:

- Energy use intensity (kWh/acre-foot) are averages for each jurisdiction
- Recycled water use reduces overall energy use intensity values
- Water-1 is implemented before Water-2 e.g. the baseline water use for Water-2 is equal to the water use after Water-1 implementation to avoid double-counting reductions.

GHG Analysis

BAU Forecast

The GHG Inventory quantified water emissions associated with 2023. The 2023 values were projected to 2030 and 2045 using population data in order to determine the water use, electricity use, and emissions associated with water for 2030 and 2045.

Emissions Reductions

Emissions reductions from recycled water were calculated by using the total water use after implementation of Water-1. The baseline energy use intensity values were then multiplied by the jurisdiction-specific implementation level and subtracted from the baseline energy use intensity to estimate the new energy use intensity after implementing Water-2. The new energy use intensity was then multiplied by the water use to estimate electricity use with implementation of Water-2. GHG emissions reductions were quantified by multiplying the new electricity use by the appropriate utility emission factors and subtracting the baseline emissions.

Wastewater

Wastewater-1: Equipment Upgrades

Measure Description

Improve wastewater treatment and pumping equipment energy efficiency by 15/25/35% by 2030

Implementation Levels:

Low: 15%

Medium: 25%

High: 35%

Assumptions

The following assumptions were considered in the evaluation of this measure:

- All equipment upgrades are assumed to reduce electricity use
- Electricity use reductions come from collection and treatment of wastewater

GHG Analysis

BAU Forecast

The GHG Inventory quantified wastewater emissions associated with 2023. The 2023 values were projected to 2030 and 2045 using population data in order to determine the wastewater use, associated electricity use, and wastewater emissions for 2030 and 2045.

Emissions Reductions

Emissions reductions from wastewater equipment upgrades were calculated by multiplying the wastewater collection and treatment electricity use by the jurisdiction-specific implementation percentage. GHG emissions reductions were quantified by multiplying the wastewater collection and treatment electricity use reductions by the appropriate utility emission factors.

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Appendix D. Authority to Implement and Intersection with Other Funding Availability

The Comprehensive Climate Action Plan (CCAP) 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.

In addition, this appendix provides a summary table of funding available that could be leveraged to pursue the objectives of the CCAP. This summary table considers the wide array of public investment available from federal, state, local, and other sources.

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 administers 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.

Funding Sources

Table D-1 Available Funding Programs			
Funding Source	GHG Measure Category	Funding Source Type	Description
U.S. Department of Energy (DOE)	Energy	Federal	The DOE provides funding and loan programs to support clean transportation, renewable energy, energy efficiency, and carbon reduction projects. These programs aim to accelerate the deployment of innovative energy technologies and infrastructure investments that advance decarbonization and climate resilience. The Inflation Reduction Act (IRA) expanded DOE's impact by investing billions into clean energy manufacturing, grid modernization, and emissions reduction technologies. Key programs include: - Zero-Emission Transit Bus Tax Exemption & Voucher Incentives: Exempts zero-emission transit buses from state sales and use taxes when sold to public agencies in California. CARB also provides vouchers to help fleets purchase electric, hybrid, and natural gas trucks and buses. - DOE Loan Programs Office: Provides loan guarantees for clean energy, fossil energy, nuclear, and infrastructure reinvestment projects under the Title 17 Innovative Clean Energy Loan Guarantee Program, supporting technologies that reduce, avoid, or sequester greenhouse gas emissions. - Renewable Energy & Energy Efficiency Projects: Offers \$4.5 billion in loan guarantees for market-ready technologies in grid integration, storage, biofuels, waste-to-energy, and efficiency improvements. The IRA also provides \$40 billion in tax credits and loans to accelerate domestic manufacturing of solar panels, wind turbines, batteries, and critical minerals processing. - Advanced Fossil Energy Projects: Supports projects that reduce carbon emissions in hard-to-decarbonize sectors, including carbon capture, low-carbon power systems, and efficiency improvements in fossil fuel production and use. - Carbon Dioxide Transportation Infrastructure Program: Provides capital for large-scale CO₂ transport projects, including pipelines, rail, and shipping, to support carbon capture and storage efforts.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
U.S. Department of Health and Human Services (HHS)	Energy	Federal	The HHS provides funding to support low-income households, climate justice initiatives, and pollution prevention efforts, focusing on energy affordability, emission reductions, and equitable climate investments to enhance community resilience. Key programs include: - Low-Income Home Energy Assistance Program (LIHEAP): Helps low-income households with energy costs, including weatherization and energy efficiency improvements. - Source Reduction Assistance Grants: Funds projects that prevent pollution and reduce environmental and health risks in vulnerable communities. - Justice40 Investments: Directs federal resources to disadvantaged communities to improve climate resilience, energy efficiency, and public health.
U.S. Environmental Protection Agency (US EPA)	Energy	Federal	The US EPA funds programs that reduce pollution, improve air and water quality, and promote environmental justice. The IRA expanded EPA's efforts by investing billions into environmental justice, clean energy, and emissions reduction initiatives. Key programs include: - Pollution Prevention & Environmental Justice Grants: Support projects that reduce industrial emissions and improve public health in disadvantaged communities. The IRA provides \$9 billion for environmental and climate justice grants, funding local solutions for air pollution, extreme heat, and water quality. - Clean Energy & Air Quality Programs: Fund clean transportation, emissions reduction, and renewable energy initiatives. The IRA's \$27 billion Clean Energy Accelerator supports the deployment of technologies that reduce emissions, particularly in underserved areas. - Brownfields & Land Revitalization: Provide funding for remediation and redevelopment of contaminated sites to support community revitalization. - Methane Emissions Reduction Program: Established through the IRA, this initiative targets methane leaks from oil, gas, and industrial facilities. - Port Electrification & Heavy-Duty Vehicle Emissions Reduction: The IRA allocates \$3 billion to reduce air pollution at ports, supporting zero-emission equipment and clean freight technologies.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
U.S. Internal Revenue Services (IRS)	Energy	Federal	The IRS oversees federal tax credits and incentives that promote clean energy adoption, home energy efficiency, and zero-emission transportation. Key programs include: - Residential Clean Energy Tax Credit: The IRA extends and increases tax credits for solar, wind, geothermal, and battery storage systems, making home energy upgrades more accessible. - Commercial Clean Vehicle Credit: Provides incentives for businesses and fleets to transition to zero-emission vehicles, reducing transportation emissions. - Energy Efficient Home Improvement Credit: The IRA expands tax credits for weatherization, heat pumps, and electrification projects, helping homeowners reduce energy consumption and costs. - EV Tax Credits: The IRA provides up to \$7,500 in tax credits for new EV purchases and up to \$4,000 for used EVs, with income-based eligibility requirements to ensure accessibility.
U.S. Department of Agriculture (USDA)	Energy, Agriculture and Natural Working Lands	Federal	The USDA funds initiatives that support climate-smart agriculture, rural energy access, and forest conservation, which help increase renewable energy adoption and strengthen climate resilience in rural communities. Key programs include: - Renewable Energy for America Program: Provides grants and loans for agricultural producers and rural businesses to install renewable energy systems. - Climate-Smart Agriculture Grants: Support soil health, wildfire resilience, and forest conservation to enhance carbon sequestration. - Rural Utility Service Programs: Invest in rural energy infrastructure, water conservation, and clean power access, with IRA-funded expansions into renewable energy and grid modernization.
U.S. Department of Housing and Urban Development (HUD)	Energy	Federal	HUD funds programs that promote energy-efficient housing, climate resilience, and equitable community development. Key programs enhance housing sustainability, improve energy efficiency, and build climate resilience: - Green & Resilient Retrofit Program: Provides funding for energy efficiency and resilience upgrades in affordable housing.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			- Community Development Block Grants (CDBG): Support local projects that improve housing, infrastructure, and sustainability. - Disaster Resilience & Mitigation Funding: Invests in climate adaptation measures for communities vulnerable to extreme weather.
U.S. Department of Transportation (US DOT)	Transportation, Energy	Federal	The US DOT funds projects that improve transportation infrastructure, expand transit access, and reduce greenhouse gas emissions. Key programs enhance mobility, expand clean transportation, and improve transportation equity: - Infrastructure Investment & Jobs Act (IIJA) Grants: Provide funding for EV charging networks, public transit, and sustainable infrastructure. The IRA supplements these efforts with additional funding for zero-emission transportation technologies. - Low & No Emission Vehicle Grants: Support the adoption of zero-emission buses and fleet electrification. The IRA added tax credits of up to \$7,500 for new EVs and \$4,000 for used EVs, accelerating clean vehicle adoption. - Safe Streets & Active Transportation Initiatives: Invest in bike, pedestrian, and multimodal transportation projects.
CAL FIRE	Agriculture and Natural Working Lands	State	CAL FIRE administers funding for wildfire prevention, reforestation, and climate adaptation in forested landscapes. Key programs reduce wildfire risks, protect communities, and enhance carbon storage: - Fire Prevention Grants: Support forest thinning, prescribed burns, and fuel reduction projects to lower wildfire risk. - Reforestation & Carbon Sequestration Initiatives: Fund tree planting and forest restoration to enhance climate resilience. - Community Wildfire Resilience Programs: Provide grants for fire-safe infrastructure and home hardening in fire-prone areas.
California Air Resources Board (CARB)	Transportation, Off-Road Equipment	State	CARB administers a range of funding programs to reduce emissions, promote zero-emission transportation, and improve air quality, with a strong focus on low-income and disadvantaged communities. These programs provide

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			grants, rebates, and incentives to accelerate the transition to cleaner mobility options. Key programs include: - Zero-Emission Vehicle Incentives: Includes the California Vehicle Rebate Program (CVRP) and Clean Vehicle Assistance Program, which offer financial assistance for purchasing or leasing electric, hybrid, and fuel-cell vehicles, prioritizing low-income recipients. - Heavy-Duty and Off-Road Vehicle Upgrades: Programs such as the Carl Moyer Program, Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), and Bus Replacement Grant Program provide funding to replace older, high-emission trucks, buses, and off-road equipment with clean alternatives. - Community-Based Mobility & Infrastructure Grants: The Clean Mobility Options Voucher Pilot Program and Car Sharing & Mobility Options Program support zero-emission mobility projects, including bikeshare, vanpooling, and innovative transit services in disadvantaged communities. - Freight & Goods Movement Emissions Reduction: The Proposition 1B Goods Movement Emission Reduction Program helps lower emissions from freight corridors and ports, while the Low Carbon Transportation Investments fund cleaner heavy-duty vehicles. - School & Public Fleet Programs: The Lower-Emission School Bus Program helps school districts replace high-polluting buses, and the Air Quality Improvement Program funds clean vehicle projects, alternative fuel research, and workforce training.
California Department of Community Services and Development (CSD)	Energy	State	CSD funds programs that reduce energy costs, improve efficiency, and enhance community resilience for low-income households. Key programs reduce energy burden, expand clean energy access, and improve energy security: - Low-Income Weatherization Program (LIWP): Provides energy efficiency upgrades, solar PV installations, and electrification retrofits for disadvantaged communities. - Community Solar & Energy Resilience Grants: Support solar access, battery storage, and microgrid projects in underserved areas. - Utility Bill Assistance Programs: Offer direct financial aid for energy bills to low-income households.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
California Department of Fish and Wildlife (CDFW)	Agriculture and Natural Working Lands	State	The CDFW funds programs that enhance biodiversity, protect ecosystems, and support climate resilience. These programs protect natural resources, increase carbon storage, and improve ecological resilience. Key programs include: - Wetland & Coastal Restoration Grants: Fund projects that restore habitats, sequester carbon, and improve climate resilience. - Forest Health & Fire Resilience Programs: Support wildfire prevention, reforestation, and carbon sequestration efforts. - Wildlife Connectivity & Adaptation Planning: Provide funding for habitat conservation and species adaptation to climate change.
CalRecycle	Solid Waste	State	CalRecycle funds programs that reduce landfill waste, promote recycling, and support organic waste diversion, which help to lower emissions and advance California's circular economy goals. Key programs include: - Organics Grant Program: Invests in composting and anaerobic digestion to divert food waste and reduce methane emissions. - Recycling Market Development Zone Program: Supports local recycling businesses and circular economy initiatives. - Extended Producer Responsibility (EPR) Programs: Provide funding for waste reduction and product stewardship efforts.
California Department of Transportation (Caltrans)	Transportation	State	Caltrans provides funding to support active transportation, sustainable mobility, and climate adaptation in transportation planning and infrastructure. These state-administered programs aim to improve biking and pedestrian access, enhance transit planning, and build climate-resilient transportation systems. Key programs include: - Active Transportation Program (ATP): Funds bike and pedestrian infrastructure, safe routes to school projects, and active transportation planning, with at least 25% of funds benefiting disadvantaged communities. Grants are awarded through a mix of statewide competition, metropolitan agencies, and rural allocations.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			- Sustainable Transportation Planning Grants: Supports regional and local transportation planning to advance sustainability, equity, safety, and mobility. - Sustainable Communities Grants: Funds local and regional planning projects that align with state sustainability goals, including health, social equity, and economic development. - Strategic Partnerships Grants: Focuses on statewide and interregional transportation deficiencies, funding projects that improve multimodal transit and the state highway system. - Climate Adaptation Planning Grants: Allocates \$3.7 million to help local and regional agencies assess climate risks, develop adaptation strategies, and plan resilient transportation infrastructure.
California Department of Food and Agriculture (CDFA)	Energy, Agriculture and Natural Working Lands	State	The CDFA funds programs that reduce agricultural emissions, improve soil health, and promote sustainable farming. These programs promote climate resilience, reduce emissions, and enhance soil and water sustainability: - Healthy Soils Program: Provides grants for carbon farming, cover crops, and soil conservation practices. - Alternative Manure Management Program: Supports methane reduction projects in dairy and livestock operations. - State Water Efficiency & Enhancement Program (SWEEP): Invests in water-efficient irrigation systems and renewable energy for farms.
California Energy Commission (CEC)	Energy, Transportation	State	The CEC funds programs that support EV charging infrastructure, clean transportation technologies, and energy efficiency projects, with a focus on innovation, deployment, and accessibility. Key programs expand clean transportation infrastructure, promote energy efficiency, and support California's transition to a low-carbon economy: - California Capital Access Program: Provides incentives for small businesses and lenders to finance EV charging station projects. - CALeVIP & Southern California Incentive Project: Offers rebates of up to \$80,000 for DC fast EV charger installations, with increased funding for projects in disadvantaged communities. - Clean Transportation Program: Invests up to \$100 million annually to accelerate the development and

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			deployment of alternative fuel and advanced vehicle technologies. - Energy Conservation Assistance Act (ECAA) Loan Program: Provides zero- and low-interest loans to schools, local governments, and public institutions for energy efficiency retrofits and renewable energy projects.
California Natural Resources Agency (CNRA)	Energy, Agriculture and Natural Working Lands	State	The CNRA funds programs that promote green infrastructure, carbon sequestration, and environmental mitigation, with a focus on disadvantaged communities and GHG reduction. Key programs enhance urban sustainability, reduce emissions, and improve environmental resilience: - Urban Greening Grant Program: Supports projects that sequester carbon, reduce energy use, and decrease vehicle miles traveled. - Environmental Enhancement & Mitigation Program: Funds urban forestry and other projects that mitigate the environmental impacts of transportation infrastructure. - Urban Green Infrastructure Program: Provides funding for multi-benefit green infrastructure projects, prioritizing disadvantaged communities.
California Public Utilities Commission (CPUC)	Energy, Transportation, Off-Road Equipment	State	The CPUC funds programs that promote renewable energy, building electrification, transportation electrification, and energy affordability, with a focus on low-income households and disadvantaged communities. Key programs include: - Renewable Energy & Energy Storage: Supports solar PV, solar water heating, and distributed energy storage through incentives and rebates. - Building Electrification: Invests \$200M in clean heating technologies to reduce fossil fuel use in buildings. - Transportation Electrification: Allocates \$1 billion for EV charging infrastructure, prioritizing medium- and heavy-duty vehicles and underserved communities. - Utility Bill Assistance: Provides discounts of 18–35% on electricity and gas bills for qualifying low-income households.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
California Department of Housing and Community Development (HCD)	Energy	State	HCD funds programs that expand affordable housing, promote sustainable land use, and support climate resilience. These programs integrate transportation, infrastructure, and energy efficiency to create healthier, more equitable communities across California. Key programs include: - Affordable Housing & Sustainable Communities (AHSC): Provides funding for affordable housing projects near transit, promoting walkability, lower emissions, and equitable access to transportation. - Local Early Action Planning (LEAP) Grant: Supports local governments in streamlining housing approvals and accelerating sustainable housing development. - Disaster Resilience & Mitigation Funding: Includes Community Development Block Grant - Mitigation (CDBG-MIT) and Disaster Recovery (CDBG-DR) programs that are funded by HUD (administered by HCD) as well as fire-safe housing grants, and resilience-focused affordable housing initiatives to strengthen housing and infrastructure against climate risks like wildfires, floods, and extreme heat. - Homekey & Project Roomkey (for Climate Resilience & Emergency Housing): Provides grants to convert hotels, motels, and other properties into long-term affordable housing, including considerations for climate resilience and extreme weather preparedness.
California State Transportation Agency (CalSTA)	Transportation	State	The CalSTA funds programs that expand transit, reduce emissions, and improve transportation infrastructure. Key programs enhance transit accessibility, lower transportation emissions, and improve climate resilience: - Transit & Intercity Rail Capital Program (TIRCP): Supports zero-emission transit projects and rail expansion. - Active Transportation & Mobility Grants: Fund bike and pedestrian infrastructure, multimodal transportation planning, and transit access improvements. - Climate Adaptation & Resilience Investments: Provide funding for transportation infrastructure upgrades to withstand extreme weather events.
Strategic Growth Council (SGC)	Transportation, Energy	State	The SGC funds projects that integrate climate resilience, sustainable development, and social equity through key programs, including:

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			- Transformative Climate Communities (TCC) Program: Provides funding for community-led climate action projects in disadvantaged areas. - Affordable Housing & Sustainable Communities (AHSC): Invests in affordable housing near transit, active transportation infrastructure, and clean mobility options. - Regional Climate Collaboratives: Support local governments and organizations in developing climate adaptation and resilience strategies.
Clean Power Alliance (CPA)	Energy	Regional	The CPA funds local renewable energy, community solar, and energy resilience projects. Key programs expand clean energy access and improve community resilience: - Community Solar & Battery Storage Grants: Support solar plus storage deployment in low-income communities. - 100% Renewable Energy Initiatives: Provide affordable clean energy options to customers. - Resilient Grid Infrastructure Investments: Fund microgrids and distributed energy resources for energy security.
South Coast Air Quality Management District (SCAQMD)	Transportation, Energy, Off-Road Equipment	Regional	The SCAQMD provides grants, incentives, and rebates to reduce air pollution, vehicle emissions, and fossil fuel dependence, with a focus on low-income and environmental justice communities. - AB 617 Implementation: Supports community emissions reduction plans, monitoring, and facility upgrades, with \$107.5M in funding for cleaner heavy-duty vehicles under the Carl Moyer Program. - Vehicle Engine Upgrade Programs: Provides grants, subsidies, and vouchers to replace or retrofit heavy-duty trucks, freight vehicles, and goods movement equipment with cleaner technologies. - Replace Your Ride & EV Charging Incentives: Offers funding for low-income residents to replace older vehicles with cleaner alternatives and install home EV chargers. - Clean Fuels Fund: Grants for alternative fuel infrastructure to support the transition from gasoline and diesel to cleaner fuels like natural gas. - Electric Lawn Mower Rebate Program: Offsets the cost of replacing gas-powered mowers with electric

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			models. - CLEANair Furnace Rebate Program: Provides rebates for energy-efficient, low-NOx furnaces that meet clean air standards.
Southern California Gas Company (SoCalGas)	Energy	Regional	SoCalGas provides energy efficiency, weatherization, and incentive programs for residential, multifamily, and commercial customers to help reduce energy use and costs. Cities can also join Local Government Partnerships to access rebates, facility audits, and community outreach support. These programs are funded by California utility customers under the oversight of the CPUC. Key programs support energy efficiency, lower utility costs, and improve access to clean energy solutions for Southern California residents and businesses: - Energy Savings Assistance Program: Offers free weatherization services to low-income households that qualify under CARE income guidelines. - Comprehensive Mobile Home Program: Provides no-cost energy efficiency evaluations and installations for mobile homes, including low-flow showerheads and HVAC system improvements. - Commercial & Residential Direct Install Programs: Offers free energy efficiency upgrades to businesses and homes, helping customers reduce energy and water consumption. - SoCalGas Marketplace: Online platform featuring rebates and incentives for energy-efficient appliances and consumer electronics. - Natural Gas Vehicle (NGV) Billing Rate: Provides a special residential rate for customers refueling natural gas vehicles at home, potentially lowering fuel costs.
Southern California Regional Energy Network (SoCalREN)	Energy, Water, Wastewater	Regional	SoCalREN provides services to residents, businesses, and public agencies throughout the areas served by Southern California Edison (SCE) and/or SoCalGasQualifying agencies include cities, counties, school districts, water districts, sanitation districts, and other public agencies. SoCalREN offers: - Public Agency Programs for energy efficiency upgrades in facilities like wastewater treatment plants, schools, and libraries.

Table D-1
Available Funding Programs

Funding Source	GHG Measure Category	Funding Source Type	Description
			- Strategic Energy Management support for public agencies. - Financing and technical assistance for energy-saving projects.
Southern California Edison (SCE)	Energy	Regional	SCE provides funding and incentives to support EV charging infrastructure, energy efficiency, and clean energy adoption, which help reduce emissions, improve energy affordability, and expand clean transportation infrastructure in California. Key programs include: - Charge Ready Program & Transit Bus Pilot: Provides funding and technical support for installing EV charging infrastructure at multi-family buildings, businesses, and transit agencies. - Energy Savings Assistance Program: Offers free energy efficiency upgrades for low-income households, including weatherization and appliance replacements. - Business & Mobile Home Efficiency Upgrades: Provides free energy conservation assessments and equipment upgrades for businesses and mobile home residents. - Renewable Energy & EV Incentives: Supports green rate programs, EV time-of-use charging discounts, and community renewable energy options.
Inland Regional Energy Network (IREN)	Energy	Regional	The Inland Regional Energy Network (I-REN) connects local governments, the workforce, and other stakeholders to a wide range of energy efficiency resources. The Public Sector Program focuses on: - Providing local governments with support and resources to develop and implement their strategic energy plans and energy efficiency projects - Helping local governments to afford and finance a range of energy efficiency upgrades - Establishing one-on-one support for local governments' energy efficiency projects - Developing or enhancing strategic energy plans to connect local government goals related to climate, resilience, and economic development to energy efficiency programs and adoption
National Electric Vehicle Infrastructure (NEVI) Program	Transportation	Federal	Grant program with \$5 billion in funding available. The Program provides \$5 billion of funding to States to deploy electric vehicle (EV) charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability. Initially, funding under the Program is directed to infrastructure acquired or

Table D-1 Available Funding Programs			
Funding Source	GHG Measure Category	Funding Source Type	Description
			installed along designated electric vehicle (EV) Alternative Fuel Corridors (AFCs). When the State determines and the Secretary certifies that AFCs in a State are fully built out, funding may be used for EV charging infrastructure on any public road or in other publicly accessible locations

Appendix E. Workforce Development Programs

Tables E-1 through E-8 below show the training programs for the occupations that are estimated to have the highest workforce shortages in the Riverside-San Bernardino-Ontario, CA MSA. The training programs are provided by community colleges, other colleges/universities, private entities, and apprenticeship sponsors located in Riverside or San Bernardino Counties.

Table E-1 Workforce Programs for Laborers and Freight, Stock, and Material Movers			
Institution	Type	County	Course/Program
Barstow Community College	Community College	San Bernardino	Forklift Professional Certificate
Mission Career College	Community College	Riverside	Forklift Professional Certificate
Atlas Forklift Training	Private Training Provider	San Bernardino	Forklift Professional Certificate
ROI Safety Services	Private Training Provider	Riverside	Forklift Professional Certificate
All Purpose Forklift Training	Private Training Provider	San Bernardino	Forklift Professional Certificate
All State Forklift Training Center	Private Training Provider	Riverside	Forklift Professional Certificate
USA Forklift Certification	Private Training Provider	Riverside	Forklift Professional Certificate

Table E-2 Workforce Programs for Heavy and Tractor-Trailer Truck Drivers			
Institution	Type	County	Course/Program
Construction Teamsters Apprenticeship Program	Apprenticeship	San Bernardino	Apprenticeship
California State University-San Bernardino	College	San Bernardino	Commercial Driver's License
San Bernardino Valley College	Community College	San Bernardino	Commercial Driver's License
Victor Valley College	Community College	San Bernardino	Commercial Driver's License
America Truck Driving	Private Training Provider	Riverside	Commercial Driver's License
C.R. England	Private Training Provider	Riverside	Commercial Driver's License

Table E-2
Workforce Programs for Heavy and Tractor-Trailer Truck Drivers

Institution	Type	County	Course/Program
West Coast Trucking School	Private Training Provider	Riverside	Commercial Driver's License
160 Driving Academy	Private Training Provider	Riverside, San Bernardino	Commercial Driver's License
Swift Transportation	Private Training Provider	Riverside, San Bernardino	Commercial Driver's License
Advanced School of Driving	Private Training Provider	San Bernardino	Commercial Driver's License
American Tech Trucking School	Private Training Provider	San Bernardino	Commercial Driver's License
Automotive Training Academy of California	Private Training Provider	San Bernardino	Commercial Driver's License
Beaumont School of Trucking	Private Training Provider	San Bernardino	Commercial Driver's License
CDL Basic Training, LLC	Private Training Provider	San Bernardino	Commercial Driver's License
Commercial Drivers License of California	Private Training Provider	San Bernardino	Commercial Driver's License
East Valley College	Private Training Provider	San Bernardino	Commercial Driver's License
Pilot Trucking School	Private Training Provider	San Bernardino	Commercial Driver's License
Progress Trucking School	Private Training Provider	San Bernardino	Commercial Driver's License
Sergio School of Trucking	Private Training Provider	San Bernardino	Commercial Driver's License
SPCDL Truck Driving School	Private Training Provider	San Bernardino	Commercial Driver's License
Truck Driver Academy	Private Training Provider	San Bernardino	Commercial Driver's License
Universal Technical Institute	Private Training Provider	San Bernardino	Commercial Driver's License
Universal Truck Driving School	Private Training Provider	San Bernardino	Commercial Driver's License

Table E-3
Workforce Programs for Industrial Truck and Tractor Operators

Institution	Type	County	Course/Program
AP Crane Training - Riverside	Private Training Provider	Riverside	Crane Operator Certificate

Table E-3
Workforce Programs for Industrial Truck and Tractor Operators

Institution	Type	County	Course/Program
California Crane Certification - Riverside	Private Training Provider	Riverside	Crane Operator Certificate
Dependable Crane School - Riverside	Private Training Provider	Riverside	Crane Operator Certificate
Dependable Crane School - San Bernardino	Private Training Provider	Riverside	Crane Operator Certificate
Miller Crane Works Inc	Private Training Provider	Riverside	Crane Operator Certificate
The Crane School - Riverside	Private Training Provider	Riverside	Crane Operator Certificate
California Crane School	Private Training Provider	San Bernardino	Crane Operator Certificate
Heavy Equipment Colleges of America - San Bernardino	Private Training Provider	San Bernardino	Crane Operator Certificate
Heavy Equipment Colleges of America - San Bernardino	Private Training Provider	San Bernardino	Heavy Equipment Operations Certificate
International Union of Operating Engineers - Local 12	Private Training Provider	San Bernardino	Heavy Equipment Operations Certificate

Table E-4
Workforce Programs for Light Truck Drivers

Institution	Type	County	Course/Program
California State University-San Bernardino	College	San Bernardino	Commercial Driver's License
San Bernardino Valley College	Community College	San Bernardino	Commercial Driver's License
Victor Valley College	Community College	San Bernardino	Commercial Driver's License
America Truck Driving	Private Training Provider	Riverside	Commercial Driver's License
C.R. England	Private Training Provider	Riverside	Commercial Driver's License
West Coast Trucking School	Private Training Provider	Riverside	Commercial Driver's License
160 Driving Academy	Private Training Provider	Riverside, San Bernardino	Commercial Driver's License
Swift Transportation	Private Training Provider	Riverside, San Bernardino	Commercial Driver's License
Advanced School of Driving	Private Training Provider	San Bernardino	Commercial Driver's License

Table E-4
Workforce Programs for Light Truck Drivers

Institution	Type	County	Course/Program
Automotive Training Academy of California	Private Training Provider	San Bernardino	Commercial Driver's License
Beaumont School of Trucking	Private Training Provider	San Bernardino	Commercial Driver's License
Commercial Drivers License of California	Private Training Provider	San Bernardino	Commercial Driver's License
East Valley College	Private Training Provider	San Bernardino	Commercial Driver's License
Pilot Trucking School	Private Training Provider	San Bernardino	Commercial Driver's License
Progress Trucking School	Private Training Provider	San Bernardino	Commercial Driver's License
Truck Driver Academy	Private Training Provider	San Bernardino	Commercial Driver's License
Universal Technical Institute	Private Training Provider	San Bernardino	Commercial Driver's License
Universal Truck Driving School	Private Training Provider	San Bernardino	Commercial Driver's License

Table E-5
Workforce Programs for Electricians

Institution	Type	County	Course/Program
Freedom Forever Southern California, LLC	Apprenticeship	Riverside	Apprenticeship
Chaffey College - InTech Center	Apprenticeship	San Bernardino	Apprenticeship
Inland/Desert Employers Apprenticeship Program	Apprenticeship	San Bernardino	Apprenticeship
Riverside Area Electrical JATC	Apprenticeship	San Bernardino	Apprenticeship
San Bernardino, Mono & Inyo Counties Electrical JATC	Apprenticeship	San Bernardino	Apprenticeship
Victor Valley College	Apprenticeship	San Bernardino	Apprenticeship
California State University-San Bernardino	College	San Bernardino	<1 Year Certificate
InterCoast Colleges-Riverside	Community College	Riverside	1-2 Year Certificate
San Joaquin Valley College-Rancho Mirage	Community College	Riverside	<1 Year Certificate
UEI-Riverside	Community College	Riverside	1-2 Year Certificate
CET-Colton	Community College	San Bernardino	1-2 Year Certificate
San Joaquin Valley College-Ontaria	Community College	San Bernardino	1-2 Year Certificate
Summit College	Community College	San Bernardino	<1 Year Certificate
Victor Valley College	Community College	San Bernardino	<1 Year Certificate

Table E-6 Workforce Programs for Heating, Air Conditioning, and Refrigeration Mechanics and Installers			
Institution	Type	County	Course/Program
Evolution Mechanical Apprenticeship Program	Apprenticeship	Riverside	Apprenticeship
Inland Refrigeration JATC	Apprenticeship	San Bernardino	Apprenticeship
San Bernardino & Riverside Co. Plumbing & Steamfitters	Apprenticeship	San Bernardino	Apprenticeship
California State University-San Bernardino	College	San Bernardino	<1 Year Certificate
American College of Healthcare and Technology	Community College	Riverside	1-2 Year Certificate
CET-Coachella	Community College	Riverside	1-2 Year Certificate
College of the Desert	Community College	Riverside	<1 Year Certificate
InterCoast Colleges-Riverside	Community College	Riverside	<1 Year Certificate
Mayfield College	Community College	Riverside	<1 Year Certificate
Norco College	Community College	Riverside	1-2 Year Certificate
Riverside City College	Community College	Riverside	1-2 Year Certificate
San Joaquin Valley College-Rancho Mirage	Community College	Riverside	<1 Year Certificate
UEI-Riverside	Community College	Riverside	1-2 Year Certificate
CET-Colton	Community College	San Bernardino	1-2 Year Certificate
Chaffey College	Community College	San Bernardino	<12 Week Certificate
San Bernardino Valley College	Community College	San Bernardino	1-2 Year Certificate
San Joaquin Valley College-Ontario	Community College	San Bernardino	1-2 Year Certificate
Summit College	Community College	San Bernardino	<1 Year Certificate
UEI College-Ontario	Community College	San Bernardino	1-2 Year Certificate
Victor Valley College	Community College	San Bernardino	<1 Year Certificate
North American Heating and Air Conditioning	Private Training Provider	San Bernardino	1-2 Year Certificate
Universal Technical Institute	Private Training Provider	San Bernardino	<1 Year Certificate

Table E-7 Workforce Programs for Plumbers, Pipefitters, and Steamfitters			
Institution	Type	County	Course/Program
Associated Compliance & Training Apprenticeship Program	Apprenticeship	Riverside	Apprenticeship
Advanco Fire Protection, Inc. Apprenticeship Program	Apprenticeship	San Bernardino	Apprenticeship

Table E-7 Workforce Programs for Plumbers, Pipefitters, and Steamfitters			
Institution	Type	County	Course/Program
Christopherson Fire Protection	Apprenticeship	San Bernardino	Apprenticeship
Pomona & San Gabriel Valleys Plumbers & Steamfitters J.A.C.	Apprenticeship	San Bernardino	Apprenticeship
San Bernardino & Riverside Co. Plumbing & Steamfitters	Apprenticeship	San Bernardino	Apprenticeship
Tri County Fire Apprenticeship Program (Pontolillo, Inc.)	Apprenticeship	San Bernardino	Apprenticeship
California State University-San Bernardino	College	San Bernardino	<1 Year Certificate
Summit College	Community College	San Bernardino	<1 Year Certificate
Victor Valley College	Community College	San Bernardino	<1 Year Certificate

Table E-8 Workforce Programs for Solar Photovoltaic Installers			
Institution	Type	County	Course/Program
University of California-Riverside	College	Riverside	<1 Year Certificate
California State University-San Bernardino	College	San Bernardino	<1 Year Certificate
Mission Career College	Community College	Riverside	<1 Year Certificate
Norco College	Community College	Riverside	<1 Year Certificate
San Bernardino Valley College	Community College	San Bernardino	<1 Year Certificate
Victor Valley College	Community College	San Bernardino	<1 Year Certificate
Ambassador Energy Solar Training	Private Training Provider	Riverside	<1 Year Certificate
GRID Alternatives	Private Training Provider	Riverside	<1 Year Certificate

Appendix F. Engagement Summary

This appendix provides an overview of the diverse engagement activities carried out during the development of the PCAP, which informed the CCAP. A variety of engagement activities were employed during development of the PCAP and were expanded on throughout the CCAP development. The focus of the CPRG 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.

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 priority populations that could be integrated into the 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. In order to garner broader regional feedback, a variety of engagement approaches were used to expand engagement beyond these core agencies.

Table F-1 MS 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

Table F-1
MS Steering Committee

Level of Government	Agencies
	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 CPRG program, present GHG reduction strategies, elevate concerns of and for priority populations, 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

Table F-2
Engagement with Community-Based Organizations in MSA

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
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 plans 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 plans, such as climate change and climate and environmental justice. Insights from the focus groups helped to finalize the PCAP and was incorporated into implementation grant applications. This feedback also informed the development of the CCAP and further engagement and outreach. To enable participation and respect the time and expertise of the participating CBOs, compensation was 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; highlighting the central goal of co-benefits in the CCAP and any successful funding opportunities; and receiving feedback to inform the CCAP.

Additionally, CVAG held a series of monthly meetings with municipalities to update them on the CCAP progress and gather feedback and input on the GHG inventories, forecasts, and emissions reduction measure selection.

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 CCAP. 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.

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 and CCAP. 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 has 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 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 priority population benefits, but measures common to these plans have potential to result in direct and indirect benefits to these communities 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.

Survey and Information Sharing

To further inform the CPRG planning process, SCAG led a survey targeted at local jurisdictions to gather information on their climate action priorities and potential projects for priority implementation. The results were posted 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.

CVAG developed and published a public survey in English and Spanish to gather information on residents and business owners' climate action priorities. The results were shared with each jurisdiction, which helped to inform measure selection. In total, the CVAG GHG Emissions Community Survey received 675 responses (673 English, 2 Spanish). Key priorities for residents include improving air and water quality (518), cost-effectiveness and savings (452), and GHG reductions (327).

Community Survey Questions

The Community Survey was administered online using Microsoft Forms. The following text presents the language and questions contained within the Community Survey in English and Spanish.

English Version

Share your ideas to minimize greenhouse gas emissions in Coachella Valley.

There are many ways that we as a community and individuals can reduce greenhouse gas emissions. The Coachella Valley Association of Governments (CVAG) is working with the cities in the Coachella Valley to develop a Comprehensive Climate Action Plan that will include workable strategies that can be implemented locally to reduce greenhouse gas emissions. By participating in this 10-minute survey, you will help CVAG and the local cities understand what greenhouse gas reduction projects and community programs matter most to you and your community.

Climate Action Priorities

What factors are most important to you for CVAG and local cities to consider when prioritizing climate projects for funding applications?

Please select all that apply

- Greenhouse gas reductions
- Improving air and water quality
- Benefits to low-income and disadvantaged communities
- Increased job opportunities
- Cost-effectiveness and savings (e.g. lower energy bills)
- Improving disaster preparedness, safety, and resilience to climate impacts
- Other: [Write in option]

How do you think CVAG and local cities should spend money related to sustainability and greenhouse gas reductions?

Please prioritize (1 highest priority, 6 lowest priority)

- Implementing energy efficient upgrades or renewable energy in homes, businesses, and public buildings
- Implementing water conservation and clean water projects
- Making it easier to get around the city by walking, biking, or public transit
- Expanding electric vehicle infrastructure
- Reducing waste/sending less trash to the landfill
- Creating parks, planting trees, providing shade structures etc.
- Reducing temperatures in urban areas (also known as the heat island effect)

Are there specific potential emissions-reducing opportunities in your neighborhood or community that you would like to see implemented?

- Yes
 - If yes please identify or describe the project, including any information you think we need to know: location, potential partners, how it will benefit your community, etc.
- No

Transportation

What type of transportation do you use most often?

Select top three modes

- Car/Personal Vehicle
- Golf Cart
- Bike
- Walk
- Public Transit
- Rideshare
- Other: [Write in option]

If you drive a car, what kind of car?

- Gas-powered
- Electric-powered
- Hybrid (gas & electric)
- I don't own a car

If you do not drive an electric vehicle, why not?

- It is too expensive
- I would have no place to charge my car
- There is not enough charging infrastructure throughout Coachella Valley

- I don't think they are reliable
- Concerned about driving long distances
- N/A, I own an electric vehicle

If you do not take public transportation, why not?

- It takes too long/doesn't arrive often enough
- It doesn't take me where I need to go
- I don't feel safe
- The fare is too expensive
- There are no stops or stations next to me
- Inconsistent departures and/or arrivals
- I don't know how to navigate the system
- Other:

What would make you consider using alternative modes of transportation (other than a car)?

- More frequent bus service
- Bus stops closer to my home or where I want to go
- Free local shuttle program or discounted public transit passes
- More bike lanes and trails, sidewalks, and crosswalks
- Electric bikeshare and/or scooter share programs
- More stores and services within walking/biking distance of my home

Which of the following programs to reduce transportation greenhouse gas emissions should be the priority in the Coachella Valley?

Please select your top three priorities:

- Increase electric vehicle charging for passenger vehicles
- Increase electric vehicle charging for medium and heavy-duty trucks

- Expand bike and pedestrian paths and trails
- Increase local public transit service
- Expand rail service to the Coachella Valley (Coachella Valley – San Geronio Pass Rail Corridor Service Project)
- Support infill, higher density, and transit-oriented development
- Electric vehicle ridesharing
- Promote neighborhood electric vehicles
- Electric bikeshare and/or scooter share programs
- Traffic signal coordination
- Traffic calming
- Congestion pricing/express lanes
- Parking pricing and limitations
- Other:

Buildings and Energy

Which of the following programs to reduce greenhouse gas emissions associated with buildings and energy should be the priority in the Coachella Valley?

Please select your top three priorities

- Install solar panels on homes, businesses, and government buildings
- Install energy efficiency upgrades for homes, businesses, and government buildings including weatherization
- Increase the renewable portfolio of electricity provided to homes, businesses, and government buildings.
- Require homes, businesses, and government buildings to use electric appliances, heating, and cooling, instead of natural gas
- Promote cool roofs and cool pavement to reduce the heat island effect in and around homes and businesses.
- Offer education and resources to help the community learn about renewable energy

- Other:

What challenges or concerns do you face in your current living situation?

Please select all that apply

- I don't have access to air conditioning
- I have an inadequate air conditioner
- My home has mold or poor ventilation
- I am worried about my water quality
- I am worried about my air quality
- I am worried about lead-based paint in my home
- Parts of my home need repairs
- I am concerned about the energy efficiency of my home
- I am trying to reduce my utility bills
- Other

How much more would you be willing to pay on your energy bill to power your entire home with zero-emission electricity?

- 0% (I am not willing to pay more)
- 10% increase in cost
- 25% increase in cost
- 50% increase in cost
- Greater than 50% increase in cost

Would you consider installing solar panels on your home if there was a discount or rebate offered?

- Yes
- No
- I don't know

- I don't own my home

Would you consider electrifying your appliances (e.g., water heater, air conditioning, stove) in your home if there was a discount or rebate offered?

- Yes
- No
- I don't know
- I don't own my home

Waste

Which of the following programs should CVAG focus on to reduce waste?

Please select your top three priorities

- Encourage composting at homes and businesses
- Increase compost drop-off locations
- Ban plastic bags and Styrofoam containers
- Increase education and awareness around recycling
- Food share and food waste diversion
- Expand recyclable material collection resources and programs
- Other:

Off-Road Equipment

Which of the following programs to reduce greenhouse gas emissions associated with off-road equipment should be the priority in the Coachella Valley?

Please indicate if any of these should be a priority:

- Require electrification of landscaping equipment
- Prohibit idling more than 3 minutes for off-road vehicles
- Require electrification of construction equipment (where feasible)
- Require electrification of farming equipment (where feasible)

- Require electric backup power instead of diesel backup generators
- Other:

Water

Which of the following programs to reduce greenhouse gas emissions associated with water should be the priority in the Coachella Valley?

Please indicate if any of these should be a priority:

- Limiting landscaping to drought-tolerant plants
- Expanded water conservation requirements for new development
- Expanded waste conservation requirements for existing development
- Increased use of recycled water for non-potable uses
- Water conservation education and outreach
- Other:

Vegetation and Agriculture

Which of the following programs to reduce greenhouse gas emissions associated with trees and agriculture should be the priority in the Coachella Valley?

Please indicate if any of these should be a priority:

- Planting of urban shade trees
- Community gardens
- Promotion of carbon farming (increasing soil carbon while farming)
- Promote on-farm renewable energy generation
- Restoration of degraded natural lands with native vegetation
- Prevention of expansion of development into natural vegetated areas
- Other:

Demographics and Other Questions

This information helps CVAG keep you updated on the progress of the Comprehensive Climate Action Plan and ensure that survey responses represent all of our diverse community.

Are you interested in receiving updates on the development of CVAG's comprehensive climate action plan?

- Yes
 - If yes, please provide your email address:
- No

Are you a resident, employee, or business owner in the Coachella Valley?

Please select all that apply

- Resident
- Employee
- Business Owner
- Other:

If you are a resident or business owner, what city do you reside in or have your business?

- <Drop down menu of cities to choose from>

What is your name?

Enter your answer

What is your race/ethnicity?

Please select all that apply

- American Indian/Alaska Native
- Asian
- Black/African American
- Hispanic/Latino
- Middle Eastern/North African
- Native Hawaiian/Pacific Islander
- White
- Other:

What is your zip code?

Enter your answer

What is your age?

- Under 25
- 25 to 35
- 35 to 45
- 45 to 55
- 55 and up

Is there anything else you would like to add?

Enter your answer

Thank you for taking the time to share your priorities for GHG reduction projects and programs in the Coachella Valley! We appreciate your time and input.

Spanish Version

Compartir sus ideas para reducir las emisiones de gases de efecto invernadero en el Valle de Coachella.

Hay muchas maneras en que nosotros, como comunidad e individuos, podemos reducir las emisiones de gases de efecto invernadero. La Asociación de Gobiernos del Valle de Coachella (conocido como Coachella Valley Association of Governments, CVAG) está trabajando con las ciudades en el Valle de Coachella para desarrollar un Plan de Acción Climática Integral que incluirá estrategias viables que se pueden implementar localmente para reducir las emisiones de gases de efecto invernadero. Al participar en esta encuesta de diez minutos, ayudaría a CVAG y las ciudades locales a comprender qué proyectos de reducción de gases de efecto invernadero y programas comunitarios son más importantes para usted y su comunidad.

Prioridades de Acción Climática

¿Qué factores son los más importantes para usted que CVAG y las ciudades locales consideran en cuenta a la hora de priorizar los proyectos climáticos para las solicitudes de financiación?

Por favor, seleccione todas que se correspondan.

- Reducción de gases de efecto invernadero
- Mejorar la calidad del aire y del agua

- Beneficios a las comunidades de bajos ingresos y desfavorecidas
- Aumento de las oportunidades laborales
- Rentabilidad y ahorro (por ejemplo, fracturas de energía más bajas)
- Mejorar la preparación, la seguridad y la resiliencia ante los impactos climáticos
- Otro:

¿Como cree que CVAG y las ciudades deberían gastar el dinero relacionado con la sostenibilidad y la reducción de gases de efecto invernadero?

Por favor, priorice (1 prioridad más alta, 6 prioridad más baja)

- Implementación de mejoras de eficiencia energética o energía renovable en hogares, empresas, y edificios públicos
- Implementación de proyectos de conservación de agua y agua limpia
- Facilitar los desplazamientos por la ciudad a pie, en bicicleta o en transporte público
- Ampliación de la infraestructura de vehículos eléctricos
- Reducir los residuos/enviar menos basura al vertedero
- Crear parques, plantar árboles, proporcionar estructuras de sombra, etcétera.
- Reducción de las temperaturas en zonas urbanas (también conocido como efecto isla de calor)

¿Existen oportunidades potenciales específicas de reducción de emisiones en su vecindario o comunidad que le gustaría que se implementaran?

- Si
 - En caso afirmativo, identifique o describe el proyecto, incluyendo cualquier información que crea necesitamos saber: ubicación, socios potenciales, como beneficiará a su comunidad, etcétera.
- No

Transporte

¿Qué tipo de transporte utiliza con más frecuencia?

Seleccione las tres prioridades principales:

- Coche/vehículo personal
- Carrito de golf
- Bicicleta
- Caminar
- Transporte público
- Viajes compartidos, como Lyft, Uber, etc.
- Otro:

Si conduce un coche, ¿qué tipo de coche?

- A gas
- Vehículo eléctrico
- Híbrido (gas y eléctrico)
- No tengo coche

Si usted no conduce un vehículo eléctrico, ¿por qué no?

- Es demasiado caro
- No tendría donde cargar mi coche
- No hay suficiente infraestructura de carga en todo el Valle de Coachella
- No creo que sean fiables
- Preocupado por conducir largas distancias
- N/A, tengo un vehículo eléctrico

Si no toma transporte público, ¿por qué no?

- Tarda demasiado o no llega con la suficiente frecuencia
- No me lleva donde tengo que ir
- No me siento seguro
- La tarifa es demasiado cara
- No hay estaciones ni paradas a mi lado

- Salidas y/o llegadas inconsistentes
- No sé cómo navegar por el sistema
- Otro

¿Qué le haría considerar el uso de los modos de transporte alternativos (que no sean un coche)?

- Servicio de autobús más frecuente
- Las paradas de autobús están más cerca de mi casa o donde quiero ir
- Programa de transporte local gratuito o pases de transporte público con descuento
- Más carriles para bicicletas y senderos, aceras y cruces peatonales
- Programas de bicicletas eléctricas compartidas y/o scooters compartidos
- Mas tiendas y servicios a poca distancia de mi casa

¿Cuál de los siguientes programas para reducir las emisiones de gases de efecto invernadero del transporte debería ser la prioridad en el Valle de Coachella?

Por favor, seleccione sus tres prioridades principales:

- Aumentar la carga de vehículos eléctricos para vehículos de pasajeros
- Aumentar la carga de vehículos eléctricos para camiones medianos y pesados
- Ampliar los carriles y senderos para bicicletas y peatones
- Aumentar el servicio de transporte público local
- Ampliar el servicio ferroviario al Valle de Coachella (Proyecto de Servicio del Corredor Ferroviario del Valle de Coachella – Paso de San Gorgonio)
- Admite relleno, mayor densidad y desarrollo orientado al tránsito
- Viajes compartidos en vehículos eléctricos
- Promover los vehículos eléctricos en el vecindario
- Programas de bicicletas eléctricas compartidas y/o scooters compartidos
- Coordinación de semáforos
- Pacificación del tráfico

- carriles rápidos
- Precios y limitaciones del estacionamiento
- Otro:

Edificación y Energía

¿Cuál de los siguientes programas para reducir las emisiones de gases de efecto invernadero asociadas con los edificios y la energía debería ser la prioridad en el Valle de Coachella?

Por favor, seleccione sus tres prioridades principales:

- Instale paneles solares en hogares, negocios y edificios gubernamentales
- Instale mejoras de eficiencia energética para hogares, empresas y edificios gubernamentales, incluida la climatización
- Aumentar la cartera de electricidad renovable suministrada a hogares, empresas y edificios gubernamentales.
- Exigir que los hogares, las empresas y los edificios gubernamentales utilicen electrodomésticos, calefacción y refrigeración, en lugar de gas natural.
- Promueva techos y pavimentos frescos para reducir el efecto de isla de calor dentro y alrededor de hogares y negocios.
- Ofrecer educación y recursos para ayudar a la comunidad a aprender sobre la energía renovable
- Otro:

¿A qué desafíos o preocupaciones se enfrenta en su situación de vida actual?

Por favor, seleccione todas las que correspondan:

- No tengo acceso al aire acondicionado
- Tengo un aire acondicionado inadecuado
- Mi casa tiene moho o mala ventilación
- Estoy preocupado por la calidad de mi agua
- Estoy preocupado por la calidad de mi aire
- Me preocupa la pintura a base de plomo en mi casa

- Partes de mi casa necesitan reparaciones
- Me preocupa la eficiencia energética de mi hogar
- Estoy tratando de reducir mis facturas de servicios públicos
- Otro

¿Cuánto más estaría dispuesto a pagar en su factura de energía para alimentar toda su casa con electricidad de cero emisiones?

- 0% (No estoy dispuesto a pagar más)
- Aumento del 10% en el costo
- Aumento del 25% en el costo
- Aumento del 50% en el costo
- Aumento de más del 50% en el costo

¿Consideraría instalar paneles solares en su hogar si se ofreciera un descuento o reembolso?

- Sí
- No
- No sé
- No soy dueño de mi casa

¿Consideraría electrificar sus electrodomésticos (por ejemplo, calentador de agua, aire acondicionado, estufa) en su hogar si se ofreciera un descuento o reembolso?

- Sí
- No
- No sé
- No soy dueño de mi casa

Desperdiciar

¿En cuál de los siguientes programas debería enfocarse CVAG para reducir el desperdicio?

Por favor, seleccione sus tres prioridades principales:

- Fomentar el compostaje en hogares y negocios
- Aumentar los lugares de entrega de compost
- Prohibir las bolsas de plástico y los recipientes de espuma de poliestireno
- Aumentar la educación y la concienciación sobre el reciclaje
- Distribución de alimentos y desvío de residuos alimentarios
- Ampliar los recursos y programas de recolección de materiales reciclables
- Otro:

Equipamiento todoterreno

¿Cuál de los siguientes programas para reducir las emisiones de gases de efecto invernadero asociadas con los equipos todoterreno debería ser la prioridad en el Valle de Coachella?

Sírvase indicar si alguna de estas opciones debe ser una prioridad:

- Requerir la electrificación de los equipos de paisajismo
- Prohibir el ralenti más de 3 minutos para vehículos todoterreno
- Requerir la electrificación de los equipos de construcción (cuando sea posible)
- Exigir la electrificación de los equipos agrícolas (cuando sea posible)
- Requieren energía eléctrica de respaldo en lugar de generadores de respaldo diésel
- Otro:

Agua

¿Cuál de los siguientes programas para reducir las emisiones de gases de efecto invernadero asociadas con el agua debería ser la prioridad en el Valle de Coachella?

Sírvase indicar si alguna de estas opciones debe ser una prioridad:

- Limitar el paisajismo a plantas tolerantes a la sequía
- Ampliación de los requisitos de conservación de agua para nuevos desarrollos
- Ampliación de los requisitos de conservación de residuos para los desarrollos existentes
- Mayor uso de agua reciclada para usos no potables

- Educación y divulgación sobre la conservación del agua
- Otro:

Vegetación y Agricultura

¿Cuál de los siguientes programas para reducir las emisiones de gases de efecto invernadero asociadas con los árboles y la agricultura debería ser la prioridad en el Valle de Coachella?

Sírvase indicar si alguna de estas opciones debe ser una prioridad:

- Plantación de árboles de sombra urbanos
- Huertos comunitarios
- Promoción de la agricultura de carbono (aumentar el carbono del suelo durante la agricultura)
- Promover la generación de energía renovable en las explotaciones agrícolas
- Restauración de terrenos naturales degradados con vegetación autóctona
- Prevención de la expansión del desarrollo a áreas naturales con vegetación
- Otro:

Demografía y otras preguntas

Esta información ayuda a CVAG a mantenerlo actualizado sobre el progreso del Plan de Acción Climática Integral y a garantizar que las respuestas de la encuesta representen a toda nuestra comunidad diversa.

¿Está interesado en recibir actualizaciones sobre el desarrollo del plan integral de acción climática de CVAG?

- Sí
 - En caso afirmativo, proporcione su dirección de correo electrónico:
- No

¿Es usted residente, empleado o propietario de un negocio en el Valle de Coachella?

Por favor, seleccione todas las que correspondan

- Residente
- Empleado

- Dueño de Negocio
- Otro:

Si usted es residente o propietario de un negocio, ¿en qué ciudad reside o tiene su negocio?

- <Menú desplegable de ciudades para elegir>

¿Cómo se llama?

- Escribe su respuesta

¿Cuál es su raza/etnia?

Por favor, seleccione todas las que correspondan

- Indio Americano/Nativo de Alaska
- Asiático
- Negro/Afroamericano
- Hispano/Latino
- Oriente Medio/Norte de África
- Nativo de Hawái/Islas del Pacífico
- Blanco
- Otro:

¿Cuál es su código postal?

- *Escribe su respuesta*

¿Cuántos años tiene?

- Menores de 25 años
- De 25 a 35 años
- De 35 a 45 años
- De 45 a 55 años
- A partir de 55 años

¿Hay algo más que le gustaría añadir?

- *Escribe tu respuesta*

¡Gracias por tomarse el tiempo para compartir sus prioridades para proyectos y programas de reducción de GEI en el Valle de Coachella! Agradecemos su tiempo y aportes.