Thousand Oaks-Oxnard-Ventura Metropolitan Statistical Area (MSA)

Comprehensive
Climate Action Plan

August 25, 2025

Thousand Oaks-Oxnard-Ventura

Metropolitan Statistical Area (MSA)

Project Lead:
County of Ventura

CCAP Authors:

County Sustainability Division

Alejandra Tellez

Heather Allen

Roxane Beigel-Coryell

Victor Briones

Consultants

Rincon Consultants, Inc.

Raimi + Associates

Date: August 1, 2025

Project Manager Contact Information: Victor Briones, Program Administrator, (805) 767-8902 or victor.briones@venturacounty.gov

Table of Contents

Tables

Figures

Appendices

Acknowledgements

Ventura County CPRG Advisory Group

- **Central Coast Climate Justice Network**
  - o Juan Lares
- **Clean Power Alliance**
  - o Joseph Cabral
- **Gold Coast Transit District**
  - o Cynthia Torres Duque
  - o Monica Gonzalez
- **Port of Hueneme**
  - o Giles Pettifor
- **The City of Fillmore**
  - o Erika Herrera
  - o Brian McCarthy
- **The City of Moorpark**
  - o Roger Pichardo
- **The City of Oxnard**

- o Ashley Barden
- o Kathleen Mallory
- **The City of Port Hueneme**
  - o James Vega
  - o Jose Coyotl
- **The City of Santa Paula**
  - o Nicholle Azpera
  - o Esteban Herrera
  - o Jonathan Royas
- **The City of Simi Valley**
  - o Angel Sierra
- **The City of Thousand Oaks**
  - o John Brooks
- **The City of Ventura**
  - o Logan Babcock
  - o Lars Davenport
- **Ventura County Air Pollution Control District**
  - o Tyler Harris
  - o Holly Galbreath
- **Ventura County Transportation Commission**
  - o Amanda Fagan
  - o Andrew Kent
- **County of Ventura Resource Management Agency**
  - o Shelley Sussman
  - o Jessica Nguyen

Other Contributors

- **Clean Power Alliance**
  - o Xico Manarolla
- EJ Harrisons & Sons
  - o Jeff Abalae
  - o Mike Harrison
- Port of Hueneme
  - o Adam Vega
- Ventura County Air Pollution Control District
  - o Danny McQuillan
- Ventura Land Trust
  - o Daniel Hulst
- Ventura County Harbor District

- o Andy Werner
- County of Ventura Public Works
    - o Tobie Mitchell
    - o Arturo Aseo
- City of Camarillo
    - o Michelle D'Anna
- County of Ventura Agriculture/Weights & Measures
    - o Alec Thille
- Ventura County Farm Bureau
    - o Maureen McGuire
- Tri-County Regional Energy Network (3C-REN)
    - o Erica Helson
    - o Ian Logan
    - o Itzel Torres
    - o Chloe Swick

County Staff

- Alejandra Tellez
- Heather Allen
- Roxane Beigel-Coryell
- Victor Briones

Consultant Team

Rincon Consultants, Inc.

Raimi + Associates

Acronyms and Abbreviations

3C-REN	Tri-County Regional Energy Network
AB	Assembly Bill
AEP	Association of Environmental Professionals
BAAQMD	Bay Area Air Quality Management District
BWBS	Blue Whales and Blue Skies
CARB	California Air Resources Board
CALGreen	California Green Building Standards Code
CalEPA	California Environmental Protection Agency
CalRecycle	California Department of Resources Recycling and Recovery
CARE	California Alternate Rates for Energy
CBO	Community Based Organization
CCCJN	Central Coast Climate Justice Network
CCAP	Comprehensive Climate Action Plan
CEJST	Climate and Economic Justice Screening Tool
CEQA	California Environmental Quality Act
CH_4	Methane
CO_2e	Carbon Dioxide Equivalent
CPA	Clean Power Alliance
CPRG	Climate Pollution Reduction Grant
DPM	Diesel Particulate Matter
EO	Executive Order
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FERA	Family Electric Rate Assistance
GHG	Greenhouse Gas
GWP	Global Warming Potential
HOA	Homeowners Association
ICLEI	Local Governments for Sustainability International Council for Local Environmental Initiatives
IRA	Inflation Reduction Act
IPCC	Intergovernmental Panel on Climate Change

kWh	Kilowatt Hour
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MT	Metric Tons
MMT	Million Metric Tons
N_2O	Nitrous Oxide
NO_x	Nitrous Oxides
OPR	Office of Planning and Research
PCAP	Priority Climate Action Plan
PM2.5	Fine Particulate Matter
RPS	Renewables Portfolio Standards
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCE	Southern California Edison
SCG	Southern California Gas Company
SCS	Sustainable Communities Strategy
SO_x	Sulfur Oxides
T&D	Transmission and Distribution
USDA	United Stated Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VCAPCD	Ventura County Air Pollution Control District
VCREA	Ventura County Regional Energy Alliance
VCTC	Ventura County Transportation Commission
VMT	Vehicle Miles Traveled
ZEV	Zero Emission Vehicle

This page intentionally left blank.

Executive Summary

Purpose and Background

Ventura County applied to the United States Environmental Protection Agency's (U.S. EPA) Climate Pollution Reduction Grant (CPRG) program to create and carry out a Comprehensive Climate Action Plan (CCAP). The purpose of this plan is to reduce emissions and improve air quality throughout the region, which is defined for the purposes of this analysis as the County of Ventura and the jurisdictions within the County. This geographic region overlaps with the Thousand Oaks-Oxnard-Ventura Metropolitan Statistical Area (MSA). The CPRG program, made possible by funding from the Inflation Reduction Act, assists state and local governments in developing and implementing strategies to combat climate change. This funding supports the development of this CCAP for the Thousand Oaks-Oxnard-Ventura MSA.

The member jurisdictions and other interested parties within the MSA aim to lower emissions by coordinating climate planning efforts, pooling resources, and emphasizing community-centered strategies. While many cities in the MSA already have individual Climate Action Plans (CAPs), this effort presents an opportunity to develop more detailed, cohesive, and regionally integrated strategies that reflect the interconnected nature of transportation, commerce, and daily life in the MSA.

The CPRG initiative includes a $250 million Planning Grant program to support the creation or enhancement of climate action plans across three key deliverables:

1. The Priority Climate Action Plan (PCAP) was completed in March 2024. This foundational document provided an overview of GHG emissions across the MSA, identified priority strategies for emissions reduction, and highlighted potential co-benefits of climate action. It also served as a launchpad for interested party engagement and regional collaboration.
2. The second deliverable is the CCAP, which builds upon the PCAP by incorporating additional planning components. These include near- and long- term GHG emissions forecasts and reduction targets, a full analysis of the benefits and proposed actions, and considerations for workforce development and economic resilience.
3. The third and final deliverable, due in 2027, is a Status Report. This report will assess the progress made in implementing the strategies, measures, and actions outlined in both the PCAP and CCAP, providing a transparent account of the region's climate action journey.

Greenhouse Gas Emissions Inventory

A GHG inventory was completed for 2022, the latest year for which there is complete community inventory data across the MSA. This inventory is broken down into seven sectors and encompasses regional activities from both incorporated and unincorporated jurisdictions within the boundary of the MSA. In 2022, total GHG emissions within the MSA, excluding carbon stock changes from natural and working lands, amounted to approximately 6.1 million metric tons of carbon dioxide equivalent (MT CO_2e). The results of the 2022 community GHG inventory can be found in Figure 1 and Figure 2 below. The highest contributors to GHG emissions are on-road transportation, energy (building natural gas and electricity), off-road equipment, and high-global warming potential (GWP) gases.

Figure 1   Oxnard-Thousand Oaks-Ventura MSA 2022 Community GHG Emissions by Sector
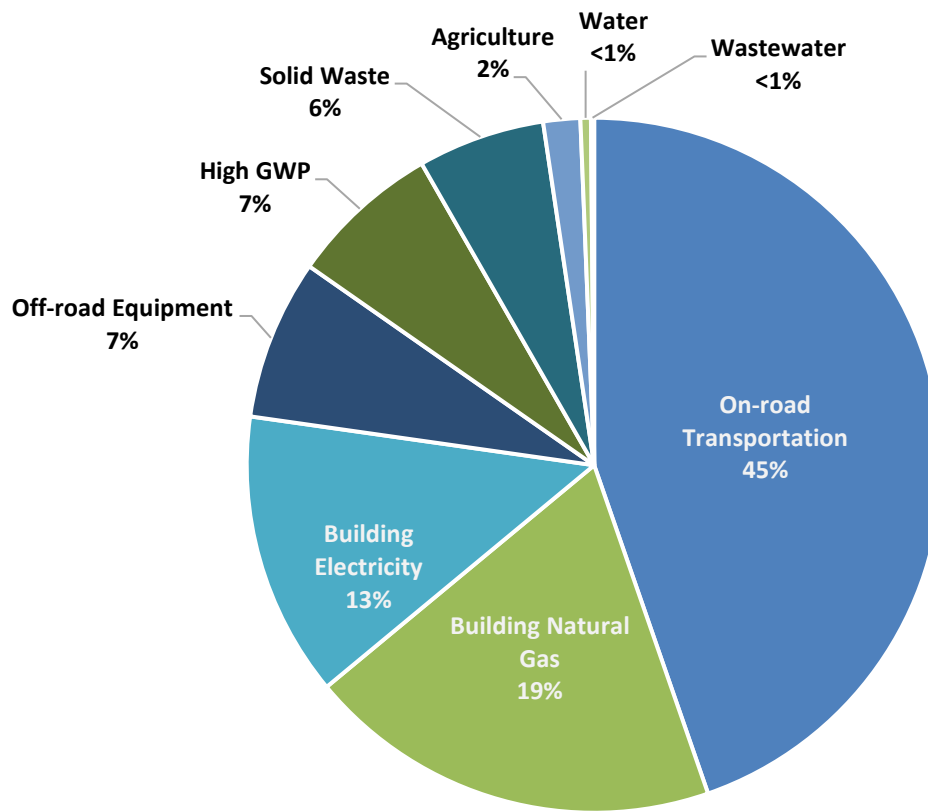
Figure 2   Oxnard-Thousand Oaks-Ventura MSA 2022 Community GHG Emissions by Sector
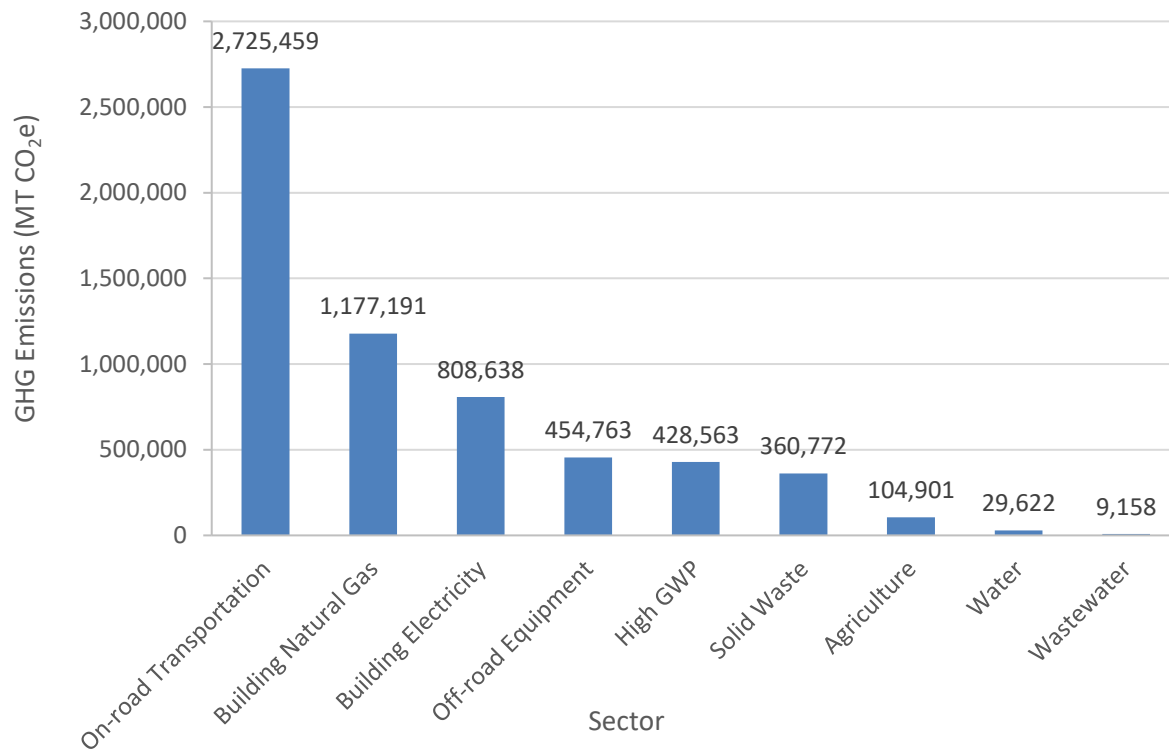
Near-Term and Long-Term Greenhouse Gas Reduction Targets

Near-term and long-term projections of GHG emissions for the MSA were completed, including a business-as-usual (BAU) scenario which assumes projected population growth under today's per capita emissions profiles, and a legislative adjusted scenario, which includes current State legislation which will continue to drive emissions down in the region. While climate goals and priorities have shifted in various ways over the years, this plan reflects the County's commitment to advancing meaningful, science-informed local action. We will continue to monitor broader policy developments and remain flexible in our approach, ensuring our efforts are well-positioned to align with future direction as it emerges.. While the CCAP is funded by the U.S. EPA, the targets established align with California's more ambitious requirements and support the various jurisdictions within the MSA's established goals. The relevant laws aimed at reducing GHG emissions are summarized in Section 3.2.1 and form the guiding principles for development of emissions targets for the MSA. The CCAP also outlines GHG reduction targets which align with key state legislation including Senate Bill (SB) 32 (2016) and Assembly Bill (AB) 1279 (2022). These targets reflect California's climate leadership and commitment to science-based action, aiming to reduce emissions to 40 percent below 1990 levels by 2030 and achieve carbon neutrality by 2045. Table 1 provides a summary of the adjusted forecast and the GHG emission reduction targets. Additional details on the GHG emissions forecast and the 2030 and 2045 targets can be found in Section 3 and Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

Table 1   Oxnard-Thousand Oaks-Ventura MSA GHG Emissions Forecast, Reduction Targets and Gap Analysis

Emissions Forecast or Pathway	2022	2030	2035	2040	2045
MSA Mass Emissions Target Pathway Scenario					
Adjusted Forecast (State Legislation)	6,099,066	5,605,855	4,930,538	4,743,736	4,595,542
SB 32 Mass Emissions Target Pathway[1]	6,099,066	4,347,736	2,898,491	1,449,245	0
Remaining Emissions Gap	0	1,258,118	2,032,047	3,294,491	4,595,542

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent. Emissions have been rounded to the nearest whole number and therefore sums may not match.
1. The target pathway is calculated by reducing 1990 mass emissions by 40% in 2030 and to 0 in 2045. This provisional target pathway is consistent with both SB 32 and a trajectory set forth to achieve AB 1279.

The gap between the targets and the forecasted MSA GHG emissions is detailed in Figure 3. The measures and actions described in this CCAP are designed to address and close this gap through thoughtful, relevant, and intentional planning, adoption, and implementation within the MSA. Figure 3 provides visual representation of the future GHG emissions for the MSA, with the 2030 and 2045 GHG reduction targets and the remaining gap the MSA will be responsible to meet.

Figure 3   Oxnard-Thousand Oaks-Ventura MSA GHG Emissions Forecast and Target Pathway (Mass Emissions)
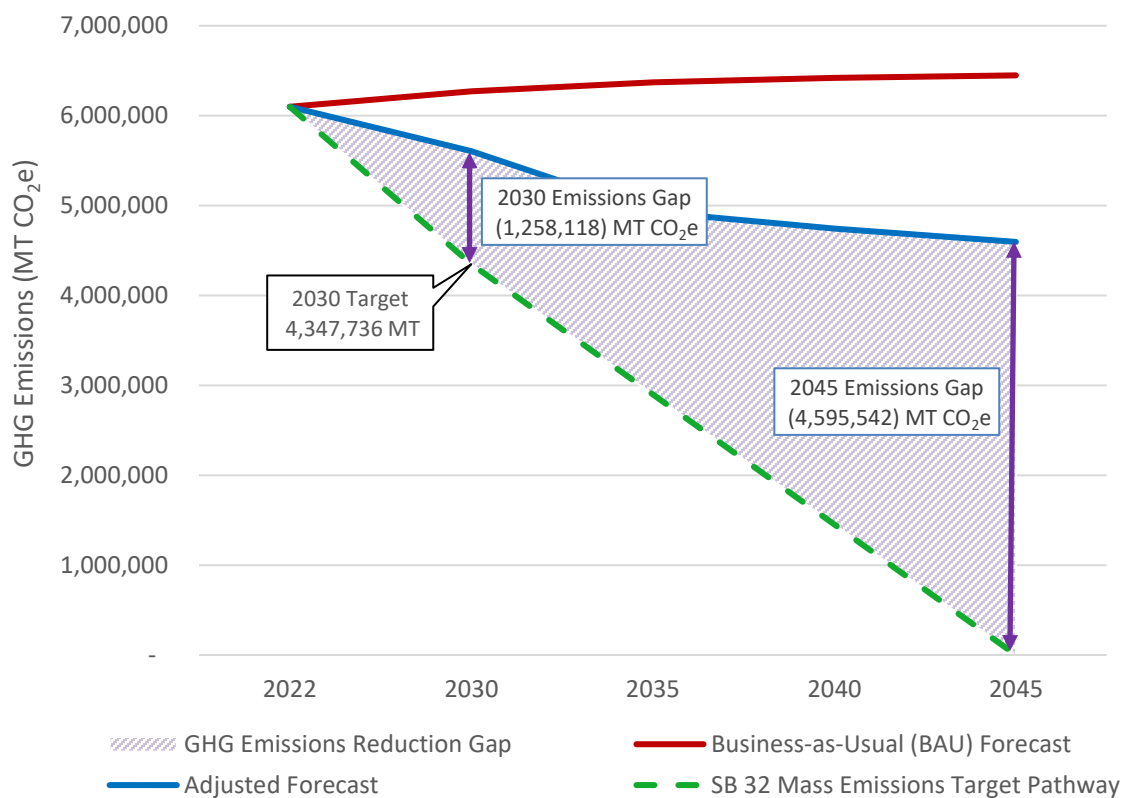
To close the emissions gap between the adjusted forecast and the established targets, the CCAP has identified a suite of implementable measures and implementation actions. These measures and actions have been developed in collaboration with local jurisdictions and partner agencies as well as a community engagement process.

Community Engagement

Robust intergovernmental coordination and outreach was conducted in the development of the CCAP, as described in Section 8. This was facilitated through the CPRG Advisory Group, which also included other interested parties including special districts. A CPRG Subcommittee was also established to collect input from community leaders throughout the region who specialize in various topics that align with and support the CCAP. Additionally, the community was invited to participate in the planning process through a survey as well as an in-person engagement event and feedback received was incorporated into the final CCAP.

CCAP Measures Summary

The emissions reduction gap illustrated in Figure 3 provided the basis for the development of comprehensive strategies, measures, and actions included in the CCAP. Table 2 provides a summary of the measures developed for each of the strategies. Full details regarding the measures, actions, and implementation timeline are provided in Section 4.

Table 2   Strategy and Measure Summary

Measure
Cornerstone
C-1: Expand the Ventura County Regional Energy Alliance's reach by evolving into an integrated Regional Climate Coalition with governance, funding, staffing, and community resources to support long-term implementation of climate action and resilience initiatives across the MSA.
Building Energy
BE-1: Transition 71% of communitywide electricity to carbon-free energy sources by 2030 and 100% by 2045 and improve electrical system resilience through distributed energy resources and demand response programs.
BE-2: Advance regional alignment of policies, incentives, and technical support so that 81% of residential buildings and 75% of nonresidential buildings are decarbonized by 2030 and remain at or above those levels through 2045.
BE-3: Decarbonize and enhance the resilience of existing buildings to reduce natural gas use by 8% by 2030 and 71% by 2045.
BE-4: Enhance grid performance and reliability through modern infrastructure upgrades.
Transportation and Mobility
TM-1: Support a transportation sales tax measure to fund prioritized transportation infrastructure improvements and transit operations across the MSA.
TM-2: Implement priority projects identified in Ventura County's Active Transportation Plan (ATP),[1] Ventura County Transportation Commission's (VCTC) Comprehensive Transportation Plan (CTP),[2] Santa Paula Branch Line (SPBL) Master Plan,[3] and the Ventura County Regional Bicycle Wayfinding Plan[4] to increase active transportation mode share in the MSA from 11% to 13% by 2030 and 20% by 2045 and convert key roadway sectors into active transportation corridors.

---

[1] Ventura County. ATP. February 2024. https://s47609.pcdn.co/wp-content/uploads/2024/03/Active-Transportation-Plan.pdf

[2] VCTC CTP. February 2023. https://www.goventura.org/wp-content/uploads/2023/05/4_VCTC_CTP_Final-Report_Feb2023.pdf

[3] VCTC Santa Paula Branch Line Trail Master Plan Update. 2025. https://www.goventura.org/spbl-trail-master-plan/

[4] Ventura County Regional Bicycle Wayfinding Plan. April 2017. https://www.goventura.org/wp-content/uploads/2018/03/VCTC_Bicycle_Wayfinding__Plan_April_2017_FINAL.pdf

Measure
TM-3: Implement priority projects identified in VCTC's Comprehensive Transportation Plan (CTP) and Gold Coast Transit District's (GCTD) Building Transit Supportive Communities (BTSC) Plan and Short Range Transit Plan to increase public transportation mode share in the MSA from 0.3% to 3% by 2030 and 10% by 2045.
TM-4: Increase passenger zero-emission vehicle (ZEV) sales and adoption to 30% by 2030 and 100% by 2045 by expanding EV charging infrastructure across the MSA.
TM-5: Increase commercial zero-emission vehicle (ZEV) sales and adoption to 20% by 2030 and 100% by 2045 by expanding the EV charging infrastructure across the MSA.
TM-6: Electrify or otherwise decarbonize 60% of small off-road equipment (SORE) and replace conventional diesel consumption with renewable diesel in 70% of applicable large diesel equipment by 2030 in alignment with EO N-79-20.
Waste Management
SW-1: Expand and optimize source-separated collection systems to reduce contamination and improve diversion outcomes to reduce organic waste to landfill 75% by 2030 compared to 2014 levels (part of SB 1383 mandates) and to implement other mandated collection systems per AB 939 and AB 341.
SW-2: Expand regional food recovery by sharing resources, improving transportation and storage systems, and enabling the rescue and distribution of edible food.
Water and Wastewater
WW-1: Advance regional One Water[5] strategies to reduce per capita potable water use by 15% by 2030, in line with California's Water Use Objective (WUO), while increasing the use and integration of alternative water sources (e.g., recycled water, stormwater, groundwater recharge) and renewable energy to build climate resilience and reduce GHG emissions.
WW-2: Expand regional opportunities for implementation of wastewater decarbonization technologies to reduce GHG emissions, manage biosolids more sustainably, and generate renewable energy or fuels.
Natural Working Lands
NWL-1: Expand and maintain a healthy regional tree canopy and riparian buffers by planting 500 new trees annually through 2045 to boost carbon sequestration, enhance biodiversity, and strengthen resilience to heat and flooding.
NWL-2: Expand and scale sustainable land management practices across rangelands, parks, and open spaces to enhance ecosystem health, improve soil and water resilience, reduce wildfire risk, and support biodiversity and long-term land productivity.
NWL-3: Meet SB 1383 procurement targets by annually procuring 39,394 tons of compost by 2030 and 39,811 by 2045.
NWL-4: Implement regional wildfire risk reduction strategies across public and private lands to protect carbon stocks, biodiversity, and community health.
Agriculture
AG-1: Accelerate adoption of climate-smart agriculture practices to improve soil health, reduce livestock (enteric fermentation) emissions 15% by 2030 and 35% by 2045, and reduce soil management (synthetic fertilizer) emissions 30% 2030 and 60% by 2045.
AG-2: Create an agricultural equipment decarbonization program to reduce agricultural fuel use 30% by 2030 and 100% by 2045.

Measure Implementation Timeline

The measures outlined in the CCAP include actions that support a mix of working groups, partnerships, pilot projects, data collection and analysis, training, funding and incentive programs, outreach and education, and the development of new ordinance frameworks. These actions can be

---

[5] One Water is an integrated, sustainable approach to water resource management that treats all water, drinking water, wastewater, stormwater, recycled water, and groundwater, as a single, interconnected resource. Rather than managing each source in isolation, One Water planning emphasizes coordination across sectors, maximizing reuse and conservation, and ensuring the right water quality is used for the right purpose. This approach enhances climate resilience, supports long-term water security, and prioritizes fair access for all communities. More information available at: https://uswateralliance.org/about-us/vision-for-a-one-water-future/

implemented within various phases such as in the near-term and through the next 20 years following development of this CCAP. Actions such as the development of a regional climate collaborative, working group, partnership, and funding and incentive programs will likely be completed within Phase 1 or 2026-2027. Actions such as education and training, pilot projects, some feasibility studies, and drafting of ordinances will likely take more implementation time, falling into Phase 2 or 2027-2030. Longer-term actions such as ordinance/policy adoption, developing new training programs, and establishment of higher funding programs will be targeted during Phase 3 or 2030-2045. This phased approach is discussed more specifically per measure and action in Section 4.

Co-benefits

While the primary goal of the CCAP is to reduce GHG emissions, many strategies included in the plan also offer additional community benefits, known as co-benefits. The combustion of fossil fuels not only emits GHGs that contribute to global climate change but also releases harmful air pollutants such as particulate matter, nitrogen oxides (NO_x), sulfur oxides (SO_x), and volatile organic compounds (VOCs), often referred to as co-pollutants. These pollutants are key drivers of smog and are linked to respiratory illnesses and other public health issues. Unlike GHGs, which have long-term global effects, co-pollutant reduction can result in immediate and localized improvements in air quality, directly benefiting nearby residents.

Recognizing and measuring these co-benefits provides a fuller understanding of the value of climate action—particularly for communities already facing environmental health burdens. This analysis is discussed further in Section 5. The distribution of air quality improvements, especially in priority communities, is further explored in Section 6 and Appendix E Priority Communities Analysis Report.

Workforce Analysis

The measures and implementation actions identified in the CCAP require high level changes to the transportation, building, waste, and agricultural systems that operate within the MSA. Electrification of the building and transportation spaces will require additional jobs in the electrical and renewable energy trades. Building new infrastructure for alternative modes of transportation will require more construction workers and other skilled tradespeople like engineers and contractors. Car mechanics will need to understand new EV systems, which are dominated by software rather than hardware. These changes, while providing major opportunities, will come with workforce and training challenges.

To support a transition to a carbon-free economy, the CCAP emphasizes creating "high-road jobs" that are fair, sustainable, and accessible to workers, particularly for priority communities. This includes confirming that workers from carbon-intensive sectors can transition into emerging green industries such as electrification and renewable energy. The workforce analysis, conducted at the MSA level, identifies key occupations needed for GHG reduction strategies and highlights workforce shortages and training needs. By focusing on inclusive workforce development, the plan aims to not only meet climate goals but also build a more resilient and fair regional economy. This analysis is discussed further in Section 7 and Appendix F Workforce Planning Analysis Reports.

A Hopeful Future

While the MSA has made meaningful progress in reducing GHG emissions, the effects of climate change are no longer distant threats, they are here now and impacting the priority communities the hardest. Yet even in the face of these challenges, there is hope. This plan lays out a bold,

coordinated approach to cut emissions across key sectors and unlock new opportunities for economic growth and community resilience. By investing in clean energy, building electrification, nature-based solutions, carbon sequestration, and inclusive workforce development, the MSA can drive meaningful local action that supports global climate goals. These steps not only reduce emissions but also create healthier, more accessible, and more sustainable communities, offering a hopeful path forward for current and future generations.

1   Introduction

At the time of preparation of a climate action plan (CAP), the effort is strongly supported by legal precedents that emphasize the responsibility of government agencies to address greenhouse gas (GHG) emissions. In 2007, the U.S. Supreme Court ruled in Massachusetts v. EPA, determining that the United States Environmental Protection Agency (U.S. EPA) is required to regulate carbon dioxide and other GHGs under the Clean Air Act. This ruling establishes a significant legal foundation for future climate regulations. Furthermore, in 2009, the U.S. EPA officially declared that the presence of GHGs in the atmosphere posed a danger to public health and welfare, reinforcing the need for regulatory action to mitigate climate change. These decisions underscore the necessity for comprehensive climate action planning to ensure compliance with legal mandates and to protect the environment, public health, and economy.

On July 27 2023,[6] the County of Ventura Sustainability Division received a planning grant through the U.S. EPA Climate Pollution Reduction Grants (CPRG) Program, a key component of the federal Inflation Reduction Act (IRA). This grant was awarded to support the development of climate action planning activities and documentation for the Thousand Oaks-Oxnard-Ventura Metropolitan Statistical Area (MSA), which geographically aligns with the County of Ventura. The IRA established the CPRG Program to equip communities across the United States with resources to address climate pollution, reduce GHG emissions, and support a prioritized transition to a low-carbon economy. The CPRG framework also seeks to stimulate job growth, support energy savings, and facilitate the deployment of innovative climate technologies and strategies.

1.1   CPRG Overview

The U.S. EPA CPRG program offers financial support to aid state, local, tribal, and territorial governments to reduce GHG emissions and other harmful air pollutants. This initiative encourages the development and implementation of creative and impactful solutions to combat climate change and improve air quality. The CPRG program includes two primary funding mechanisms: a $250 million Planning Grants program, which supports the development or expansion of climate action plans, and a $4.6 billion Implementation Grants program, which funds the execution of climate strategies and actions identified during the planning phase. The Planning Grant awarded to the County of Ventura supports the development of a Comprehensive Climate Action Plan (CCAP), included as one of the three major deliverables summarized in Table 3.

The first deliverable was the Priority Climate Action Plan (PCAP), which was completed in March 2024. The PCAP provides a foundational understanding of GHG emissions across the MSA, identifies priority strategies for emissions reduction, and outlines potential co-benefits of climate action. It also served to initiate the planning process and foster engagement with local and regional interested parties. The second deliverable is this document, the Comprehensive Climate Action Plan (CCAP), which builds upon the PCAP by including additional climate planning elements such as near- and long-term GHG emissions projections and targets, a full benefits analysis, and considerations for workforce development. The third deliverable, due in mid- to late-2027, is a Status Report that will

---

[6] U.S. Environmental Protection Agency. Climate Pollution Reduction Grants: Planning Grants: Status of Grant Awards for States as of 7/23/2024. Accessed June 16, 2025, at: https://www.epa.gov/system/files/documents/2024-04/cprg-planning-grants_0.pdf

document the progress of implementing the strategies, measures, and actions identified in both the PCAP and CCAP.

Table 3   Description of Key Deliverables under the CPRG Program

Key Deliverable	Due Date	Description
Priority Climate Action Plan (PCAP)	March 1, 2024	The PCAP contains an inventory and analysis of GHG emissions and the highest priority measures compiled by the MSA for implementation to reduce emissions.
Comprehensive Climate Action Plan (CCAP)	Draft: August 1, 2025 Final: December 31, 2025	**This document**. The CCAP expands on the GHG emissions and analysis of the PCAP, establishing and providing near-term and long-term GHG emissions projections and targets, quantified reduction measures, a full benefits analysis, and workforce planning.
MSA Status Report	Summer/Fall 2027[7]	The status report will include the status of implementation of the CCAP quantified reduction measures, with any updated supporting analysis or projections (e.g., GHG inventory and forecasting data), and next steps for implementation, including future budget and staffing needs.

1.2   CCAP Purpose and Scope

The CCAP provides a strategic framework to reduce climate pollution, create high-road jobs, and lower energy costs for families and businesses. Additionally, the CCAP prioritizes efforts to empower community-driven solutions in priority communities. The CCAP builds upon the groundwork established in the PCAP and other existing climate action and adaptation planning efforts. It also aligns with state and federal climate policies, including U.S. EPA's regulations for carbon dioxide and other GHGs under the Clean Air Act and California's mandated GHG reduction targets under Senate Bill 32 and Assembly Bill 1279, which aim for 40 percent below 1990 level emissions by 2030 and carbon neutrality by 2045, respectively.

The CCAP quantifies the major sources and sinks of GHG emissions within the MSA, including the unincorporated Ventura County areas, along with the ten incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and San Buenaventura (Ventura). The GHG emissions inventory draws upon readily available activity data from within the MSA to provide a current representation of major sources and sinks of GHG emissions within the region, including GHG emissions associated with regional on-road transportation, off-road equipment, building energy use, solid waste generation, imported water deliveries, wastewater treatment, agricultural activities, and natural and working lands (NWL). Future GHG emissions trajectories were modeled through 2045 from the baseline (2022 calendar year) MSA-wide GHG emissions inventory. This time frame aligns with state climate goals and facilitates a long-term approach to achieving carbon neutrality.

The CCAP reflects the region's commitment to implementing policies and programs that support GHG reduction across the key economic and land-use sectors listed above. Existing regulatory authorities and supportive entities such as the Ventura County Air Pollution Control District (VCAPCD), Ventura County's Sustainability Division, Ventura County Transportation Commission (VCTC), Ventura County Regional Energy Alliance (VCREA), the Port of Hueneme, Tri-County Regional

---

[7] As of June 16, 2025, an exact due date for the MSA Status Report has not yet been established.

Energy Network (3C-REN), Ventura County Resource Conservation District (VCRCD), the Ventura County Farm Bureau, and Clean Power Alliance (CPA), provide a foundation for the CCAP's implementation. Additionally, many jurisdictions in the County as well as the County itself have a Climate Action Plan and General Plans that helped inform this regional planning process.

1.2.1   Overview of PCAP and Outcomes

The PCAP focused on emissions sources and actions deemed most critical within the MSA, specifically targeting transportation, building energy, and solid waste. Key sections of the document include the GHG inventory, recommended priority actions, a priority communities analysis, and a summary of outreach efforts. The document has been downloaded 249 times prior to the CCAP's publishing, reflecting strong public interest in the region's climate planning efforts.

The PCAP serves as a launchpad for the more detailed and comprehensive CCAP. This next-phase document expands on the PCAP's priorities by introducing additional strategies and actions, a natural and working lands (NWL) assessment, and a deeper evaluation of co-benefits. Together, the CCAP and PCAP form a cohesive roadmap for long-term, prioritized climate action across the MSA.

1.2.2   County of Ventura Overview

Ventura County is located along California's south-central coastline, bordered by Santa Barbara and Los Angeles Counties to the north and south, respectively. The region spans diverse geographic and demographic features, from sea level to over 8,800 feet at the summit of Mt. Pinos, and is home to more than 840,000 residents.[8] Key attributes of the County include:

- **Agricultural Resources:** With some of the most fertile soil in California, Ventura County supports one of California's most productive agricultural sectors.[9] The industry generates approximately $2 billion in annual crop value and supports tens of thousands of jobs across farming, food processing, and related services.[10,11]

- **Economic Vibrance:** With 42 miles of coastline and the Port of Hueneme, the only deep-water port between Los Angeles and San Francisco, the MSA represents an economic hub in California. Tourism generates $1.93 billion in annual economic activity, and the Port generates $2.2 billion in trade-related activity and supports over 20,000 jobs annually.[12,13] The County is also home to educational institutions such as California State University Channel Islands and the Ventura County Community College District, which provide local pipelines to high-quality careers and strengthen the regional workforce.[14]

---

[8] United States Census Bureau. Ventura County, California. Accessed June 16, 2025, at: https://data.census.gov/profile/Ventura_County,_California?g=050XX00US06111

[9] County of Ventura Executive Office. Accessed June 16, 2025, at: https://www.ventura.org/county-executive-office/about-us/

[10] County of Ventura. June 2025. County of Ventura 2024 Crop & Livestock Report. Accessed June 27, 2025, at: https://awm.venturacounty.gov/wp-content/uploads/2025/06/2024-CR-English-Spread.pdf

[11] County of Ventura. Agriculture/Weights & Measures. About Us. Accessed June 27, 2025, at: https://awm.venturacounty.gov/

[12] Business Forward. Ventura County. VC Tourism's Ripple Effect. Accessed July 24, 2025, at: https://businessforward.venturacounty.gov/how-ventura-countys-visitor-economy-fuels-local-growth

[13] The Port of Hueneme (Oxnard Harbor District). February 23, 2022. Updated Assessment Shows Port of Hueneme's Economic Footprint Reaches All Time Highs in Ventura County. Accessed June 16, 2025, at: https://www.portofhueneme.org/economic-report-2022-john-martin/

[14] Ventura County Coast. Industry Information. Accessed June 27, 2025, at: https://venturacountycoast.com/industry/

▪ **Mediterranean Climate with High-Risk Climate Vulnerabilities:** Ventura County's mild, Mediterranean climate attracts both residents and visitors and supports year-round outdoor recreation and agriculture. However, the region faces growing climate-related threats, including extreme heat, coastal flooding, 1,000-year storms, prolonged drought, and increasingly frequent and intense wildfires. [15,16,17,18]

Ventura County encompasses diverse communities across ten incorporated cities – Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and Ventur) – and extensive unincorporated areas, making it essential to adopt a thoughtful, collaborative approach to address climate challenges effectively. See Figure 4 for a map of the MSA, showing outlines for each jurisdiction in light blue with the unincorporated area shown in darker blue.

Figure 4   Regional Map of Project Partners
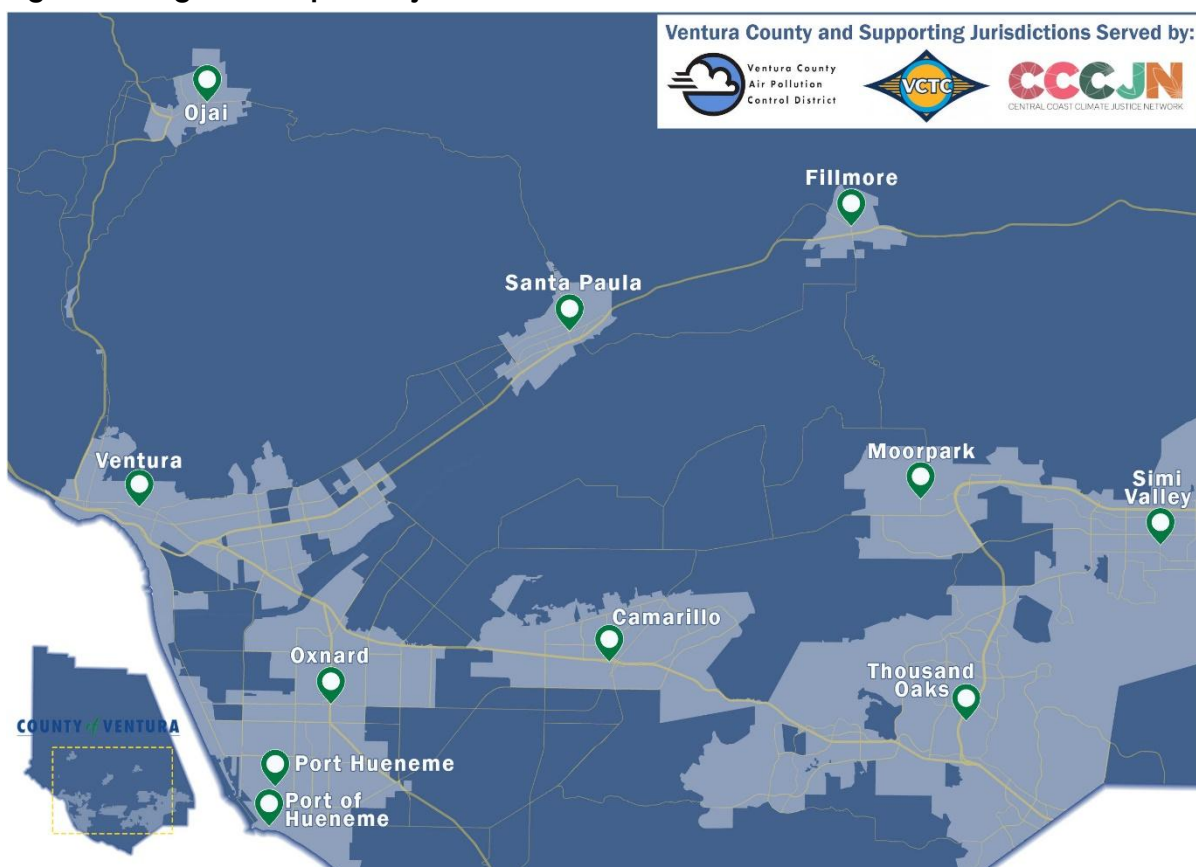
[15] Smith, Hayley and Toohey, Grace. January 25, 2024. SoCal sees two 'thousand-year' storms within weeks. More could be coming. Accessed June 16, 2025, at: https://www.latimes.com/environment/story/2024-01-25/how-perfect-storms-dumped-rain-on-ventura-and-san-diego

[16] California Department of Forestry and Fire Protection. 2024. Thomas Fire. Accessed June 16, 2025, at: https://www.fire.ca.gov/incidents/2017/12/4/thomas-fire/

[17] California Department of Forestry and Fire Protection. 2025. Mountain Fire. Accessed June 16, 2025, at: https://www.fire.ca.gov/incidents/2024/11/6/mountain-fire

[18] Sharp, Julie. December 28, 2023. Some Ventura County beaches closed as high surf and flooding wreak havoc on the area. Accessed June 16, 2025,at: https://www.cbsnews.com/losangeles/news/high-surf-hits-southern-california-coast-some-areas-to-see-15-to-20-foot-sets/

1.2.2.1   Regional Climate Planning Efforts

In recent years, Ventura County and its local cities have made significant progress in developing climate action plans, including:

- The County of Ventura Climate Action Plan[19]
- The City of Oxnard Climate Action & Adaptation Plan (CAAP)[20]
- The Camarillo Sustainability Master Plan for Municipal Operations[21,22]
- City of Ventura Climate Action and Resilience Plan[23]
- City of Thousand Oaks Climate & Environmental Action Plan (CEAP)[24]
- City of Simi Valley Climate Action Plan (CAP)[25]
- Port of Hueneme Environmental Management Framework (EMF)[26]
- Port of Hueneme Port Action, Climate, and Environmental Development (PACED) Project[27]
- City of Port Hueneme Climate Action Plan (within the 2045 General Plan)[28]

1.2.3   Approach to Developing the CCAP

The CCAP was developed through a collaborative, multi-party process to facilitate robust engagement and strengthen the MSA's dedication to implementing climate action strategies. Through meaningful engagement with local government representatives, community organizations, businesses, and the public, the CCAP reflects diverse perspectives and aims to provide accessible, actionable strategies. This section outlines the plan's development timeline, key contributors, and approach to interested party engagement, while building off efforts completed as part of the PCAP.

---

[19] County of Ventura. 2022. County of Ventura General Plan, Appendix B: Climate Change. Accessed June 16, 2025, at: https://egeneralplan.vcrma.org/appendix-b-climate-change/

[20] City of Oxnard. December 7, 2022. Climate Action and Adaptation Plan. Accessed June 16, 2025, at: https://www.oxnard.org/wp-content/uploads/2023/01/Oxnard-CAAP_2022-12-07_Adopted.pdf

[21] City of Camarillo. 2023. Sustainability Master Plan for Municipal Operations. Accessed June 16, 2025, at: https://cms7files.revize.com/camarilloca/Departments/City percent20Manager/Sustainability/SMP_Final_Approved percent2010-25-23 percent20CCReso2023-83.pdf

[22] The City of Camarillo is also preparing a CAP, which is anticipated to be adopted by the end of 2025.

[23] City of Ventura. 2024. Climate Action and Resilience Plan. Accessed June 16, 2025, at: https://static1.squarespace.com/static/5f34bf7ddc1cd21c88c0c407/t/67b678fe43ffbe11ab86585d/1740011804052/VenturaCARP_FinalDraft_2025_0219.pdf.

[24] City of Thousand Oaks. 2024. City of Thousand Oaks Climate & Environmental Action Plan (CEAP). Accessed July 24, 2025, at: https://www.toclimateaction.org/

[25] City of Simi Valley. 2021. City of Simi Valley Climate Action Plan (CAP). Accessed July 24, 2025, at: https://www.ca-ilg.org/sites/main/files/file-attachments/simi_valley-_climate_action_plan_0.pdf?1472519071

[26] Port of Hueneme, Oxnard Harbor District. Environmental Management Framework (EMF). Accessed July 24, 2025, at: https://www.portofhueneme.org/environmental-framework/

[27] Port of Hueneme, Oxnard Harbor District. Port of Hueneme Port Action, Climate, and Environmental Development (PACED) Project. Accessed July 24, 2025, at: https://www.portofhueneme.org/paced-project-and-decarbonization/

[28] City of Port Hueneme. 2045 Port Hueneme General Plan. Accessed July 24, 2025, at: https://huenemebeachfestival.org/DocumentCenter/View/6130/2045-Port-Hueneme-General-Plan?bidId=

1.2.4   Timeline and Work to Date

The CCAP is designed to build upon the foundation established by the PCAP. While the PCAP served as an initial roadmap, outlining the preliminary goals and priority strategies to address climate pollution, the CCAP takes these concepts further by refining and expanding upon them.

The CCAP incorporates detailed strategies, specific implementation pathways, and measurable targets that align with the long-term vision laid out in the PCAP. It includes input from interested parties and focuses on actionable, region-specific solutions, confirming that the steps outlined are feasible, accessible, and directly linked to local needs. Additionally, the CCAP integrates new technical analyses, insights, and feedback gathered throughout the planning process, enhancing the plan's scope and service as a practical, implementable framework for achieving climate goals.

The development of the CCAP began in August 2024. Key milestones include:

- Completing a GHG Emissions Inventory for the MSA – The GHG emissions inventory built off the GHG analysis included in the PCAP by including several new sectors and updating several data sources. The results and a description of major updates from the PCAP GHG emissions inventory can be found in Appendix A Greenhouse Gas Inventory Analysis Report.

- Completing Priority Communities Analysis for the CCAP – The CCAP Priority Communities Analysis built off the Priority Communities Analysis in the PCAP. The results and a description of major updates from the PCAP can be found in Appendix E Priority Communities Analysis Report.

- GHG Emissions Forecast and Target Setting for the CCAP – Future GHG emissions trajectories were modeled through 2045 as part of the CCAP, aligning with regional population and economic projections, state climate goals and CCAP measure development. The results and descriptions of the forecasts can be found in Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

- Preparing GHG Emissions Reduction and Adaptation Measures for the CCAP – The CCAP refines the GHG emissions reduction measures first introduced in the PCAP. It presents a comprehensive suite of both near- and long-term measures, tailored for every sector covered in the CCAP. Measure and action details can be found be found in Section 4.

- Hosting CPRG Advisory Group Meetings:
    - Meeting #1 (Kick-off) – As part of the CCAP, the MSA convened an Advisory Group of regional agency, county, and city staff to help coordinate development of the CCAP. A description of all members and the Advisory Group's focus areas can be found in Section 1.2.5 below.
    - Meeting #2 (Transportation and Mobility: Part 1) – Included discussions on the hurdles and opportunities around the transportation sector in the MSA.
    - Meeting #3 (Building Energy: Part 1) – Included discussions on the hurdles and opportunities around the building energy sector in the MSA.
    - Meeting #4 (Solid Waste, Water, and Wastewater) – Included discussions on the hurdles and opportunities around the solid waste, water, and wastewater sectors in the MSA.
    - Meeting #5 (Agriculture and Natural Working Lands) – Included discussions on the hurdles and opportunities around the agriculture and natural working lands sectors in the MSA.

- □ Meeting #6 (Transportation and Mobility: Part 2) – Focused on refining drafted transportation and mobility measures and confirming final feedback from all interested parties were incorporated.
- □ Meeting #7 (Building Energy: Part 2) – Focused on refining drafted building energy measures and confirming final feedback from all interested parties were incorporated.
- □ Meeting #8 (CCAP Draft) – The CPRG Advisory Group reviewed the draft CCAP providing comments on the overall structure, clarity of goals, and alignment of measures with community priorities and existing jurisdictional targets.

- Hosting a community meeting to provide an opportunity for community members and interested parties to review key elements of the plan, share input on proposed measures, and help shape the final recommendations.

1.2.5   CPRG Advisory Group

A critical component of the CCAP development has been the assembly of the MSA's CPRG Advisory Group. The CPRG Advisory Group reflects a coordinated, cross-jurisdictional approach grounded in regional priorities, local expertise, and community needs. The CPRG Advisory Group is a highly engaged and collaborative alliance, tasked with guiding the development of sector-specific GHG reduction measures as part of the CCAP. The group plays a central role in shaping actionable strategies, identifying funding and implementation pathways, and fostering regional alignment. Members of the CPRG Advisory Group are from regional agencies, County, and local city staff, including:

- Central Coast Climate Justice Network
- Clean Power Alliance
- Gold Coast Transit District
- Port of Hueneme
- The City of Camarillo
- The City of Fillmore
- The City of Moorpark
- The City of Ojai
- The City of Oxnard
- The City of Port Hueneme
- The City of Santa Paula
- The City of Simi Valley
- The City of Thousand Oaks
- The City of Ventura
- The County of Ventura
- Ventura County Air Pollution Control District
- Ventura County Transportation Commission

Throughout the development of the CCAP, the CPRG Advisory Group convened regularly at different locations within the region to address key GHG emission sectors within the MSA. Each session began

with a review of existing climate action or related planning initiatives specific to the sector, during which the group identified major challenges impeding current efforts. The discussions then shifted to exploring opportunities for improvement, refining existing strategies, and proposing innovative solutions for future measure implementation. Ultimately, the primary goal of these meetings was to understand implementation barriers from diverse perspectives, foster a shared sense of ownership and commitment to regional issues, and develop enhanced climate mitigation measures.

The regional collaboration has been a significant asset, as coming together at a broader scale has already proven valuable in the short term. The group's work has led to additional meetings and follow-up conversations between participants, which have played a key role in moving several projects forward. The benefit of this regional understanding fosters greater alignment and a shared sense of purpose among local leaders and interested parties.

1.2.6   Community Engagement

Community feedback also played a role in the development of the CCAP through intergovernmental coordination. A key part of this process was the formation of an Advisory Group and Committee for Advancing Sustainability: CPRG Subcommittee. The Advisory Group, composed of representatives from local cities, special districts, and regional agencies, provided strategic and technical input, meeting monthly across various county locations to facilitate the inclusion of diverse perspectives. Meanwhile, the CPRG Subcommittee, which met quarterly, focused on amplifying voices from historically underrepresented communities, contributing to a more inclusive and representative plan.

Community outreach also played a role in shaping the CCAP. Residents and community members were invited to participate through surveys and an open-house event at the County of Ventura's Sustainability Division Office. This event encouraged informal dialogue between the public and project team, allowing for direct feedback on climate priorities and solutions. Together, these efforts facilitated the reflection of both expert insights and community values in the CCAP.

2 Comprehensive Greenhouse Gas Emissions Inventory

A GHG inventory was prepared for the MSA's CCAP using a baseline year of 2022. The inventory includes sources that are under some degree of local jurisdiction, in accordance with established GHG accounting protocols and State guidance. The GHG inventory includes community GHG emissions generated by the residents and business operating within the MSA and natural and working lands (NWL) carbon sinks and sources associated with the MSA's natural and agricultural landscapes.

The MSA communitywide GHG inventory tracks key GHG emissions sources (i.e., building electricity and natural gas, on- and off-road transportation, solid waste, and water and wastewater) across all jurisdictions within in the MSA, including the ten incorporated cities—Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and Ventura—as well as the unincorporated County.

The NWL carbon inventory quantifies major carbon sinks, primarily carbon dioxide absorption pathways through the MSA's natural landscapes. This analysis includes land cover classes such as forest, shrub/scrub, wetland, cultivated and field crops, orchard, pasture and hay, grassland/herbaceous, developed, vineyard, barren, and open water. Understanding the distribution and carbon storage potential of these land types provides valuable insight into the MSA's natural capacity to sequester carbon and helps identify opportunities to preserve and enhance these sinks as part of broader climate mitigation strategies.

The results of the 2022 community GHG inventory and NWL carbon inventory informed the GHG emissions forecasts, target setting, and the development of comprehensive GHG reduction measures as part of this CCAP.

2.1 Quality Assurance Project Plan Alignment

In October 2023, the MSA submitted a Quality Assurance Project Plan (QAPP) to the U.S. EPA, which was approved in December 2023.[29] The QAPP outlines the procedures and data quality objectives necessary to provide consistency with the U.S. EPA requirements for federally funded emissions analysis, as outlined in the CPRG Planning Grant. In particular, the QAPP prioritizes the use of federally sourced or peer-reviewed data sets of the highest quality available. All data used in the development of this CCAP GHG inventory and natural working lands carbon inventory were selected in accordance with the QAPP and met either the highest or second-highest quality tier, as defined by U.S. EPA-recommended GHG accounting protocols.[30] Additionally, this CCAP was completed in conformity with U.S. EPA quality procedures and managing oversight so that quality procedures have been incorporated into all aspects of the project as documented and approved in the QAPP. A summary of the GHG accounting protocols and guidance used to prepare the GHG inventories is

---

[29] See the full Quality Assurance Project Plan (Attachment A of Appendix A Greenhouse Gas Inventory Analysis Report) for more information on how data sources were chosen and utilized for the MSA.

[30] U.S. Environmental Protection Agency. July 29, 2024. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022. Annex 8 QA/QC Procedures. Accessed on July 1, 2025, at: https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-annex-8-qaqc-procedures.pdf

provided below, with additional detail on data sources, calculation methods, and quality assurance procedures included in Appendix A Greenhouse Gas Inventory Analysis Report and Appendix D Natural Working Lands Report.

2.2 Community Greenhouse Gas Inventory Methodology

2.2.1 Baseline Inventory Year Selection

A baseline GHG emissions inventory provides a reference from which future community inventories can be compared. It is important to establish a baseline community inventory to be able to evaluate the future GHG reduction progress made from the implementation of community CCAP measures. Baseline inventories are generally selected based on the most recent year in which high quality and complete data are available

For this CCAP, the 2022 calendar year data was used because it was the most recent year with complete and validated data sets, such as utility usage reports and local agency transportation demand models, for each community sector. All selected data were determined by leveraging the highest quality and most recently available data for the MSA, including data from federal, State, and local government agencies, and public utilities.

2.2.2 Greenhouse Gas Emissions Accounting Protocol

The community GHG inventory was developed in alignment with accounting protocols provided by the Local Governments for Sustainability International Council for Local Environmental Initiatives (ICLEI) as recommended by the U.S. EPA and the California Office of Land Use and Climate Innovation (LCI), and the Intergovernmental Panel on Climate Change (IPCC).[31] ICLEI protocols are designed for local-scale accounting of GHG emissions that contribute to climate change and provide authoritative guidance to account for GHG emissions accurately and consistently. The ICLEI U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions Version 1.2 (Community Protocol) serves to guide the measurement and reporting of GHG emissions in a standardized way and is used by other jurisdictions to support their own inventory, forecast, and climate action planning efforts. The Community Protocol includes steps to evaluate the relevance, completeness, consistency, transparency, and accuracy of data used in the GHG inventory.

2.2.3 Geographic Scope of Inventory

The Community Protocol and U.S. EPA guidance recommends setting organizational boundaries for GHG accounting.[32] Consistent with the QAPP, this community GHG inventory utilizes existing data resources to develop a local inventory of the major sources of GHG emissions within the Oxnard-Thousand Oaks-Ventura MSA of which Ventura County and local jurisdictions and agencies have some degree of control and influence. Consistent with the Community Protocol, subsectors where the jurisdictions do not have some degree of control were excluded from the 2022 GHG emissions

---

[31] Association of Environmental Professionals (AEP). 2013. AEP Climate Change Committee's "The California Supplement to the United States Community-Wide Greenhouse Gas (GHG) Emissions Protocol". Accessed on June 17, 2025, at: https://califaep.org/docs/California_Supplement_to_the_National_Protocol.pdf

[32] U.S. Environmental Protection Agency. 2023. EPA Center for Corporate Climate Leadership, Determine Organizational Boundaries. Accessed on June 17, 2025, at: https://www.epa.gov/climateleadership/determine-organizational-boundaries

inventory as there is limited opportunity to develop measures to impact associated GHG emissions.[33] To confirm the inventory is geographically complete, the draft inventory was reviewed by the CPRG Advisory Group to confirm that major-emitting, local activities are included in the inventory.

2.2.4   Community Greenhouse Gas Inventory Sectors and Data Sources

As detailed in the QAPP, the data quality objectives and criteria for this project are accuracy, precision, bias, completeness, representativeness, and comparability. The community GHG inventory draws upon high quality available activity data from within the MSA to provide a realistic and current representation of all major sources of GHG emissions, including:

- On-road Transportation
- Off-road Equipment
- Building Natural Gas[34]
- Building Electricity
- Solid Waste Generation
- Water Consumption
- Wastewater Treatment
- Agriculture[35]
- High GWP Sources[36]

The community GHG inventory focuses on the three GHGs most relevant to the MSA's major sources of emissions: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other High Global Warming Potential (GWP) gases (e.g., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides) are emitted primarily in activities such as industrial processes and refrigeration and are therefore captured under the High GWP sector of the community GHG inventory. The community GHG inventory used 100-year GWP for each gas that are consistent with the IPCC Fifth Assessment Report,[37] which were also used by the U.S. EPA and the State of California in their latest GHG emissions inventories.

The MSA is located within the state of California, a state that, through the California Air Resources Board (CARB) and other agencies, has developed comprehensive datasets and analytical tools for GHG inventory, forecasting, and CAP development. These datasets, tools, assumptions, and protocols, including sector-specific estimates and/or ratios, are built on well-established, validated protocols and include locally specific data. These resources are recommended by the State and are widely adopted by jurisdictions across California to calculate inventory, forecast, and projection information for various climate reports and plans. These resources meet the QAPP guidelines for data quality and validation. Due to the quality and specificity of these protocols, tools and datasets

---

[33] Excluded subsectors included fuel consumption from private locomotive (i.e., Amtrak and Metrolink) and military operations.

[34] Building Natural Gas and Building Electricity cover the QAPP-designated sector 'Stationary Sources'

[35] QAPP-designated sectors 'land management' and 'urban forestry' are captured under the Natural and Working Lands Carbon Inventory

[36] GHG emissions from industry are captured under High GWP Sources, Building Natural Gas, Building Electricity, and Off-road Equipment

[37] Intergovernmental Panel on Climate Change (IPCC). 2014. AR5 Synthesis Report: Climate Change 2014. Accessed June 17, 2025, at: https://www.ipcc.ch/report/ar5/syr/

and their alignment with the unique regulations and requirements for California, the MSA has determined that specific California recommended protocols and data will be relied upon throughout the development of the CCAP.

The community GHG inventory was prepared using the following high quality data resources:

On-road Transportation

- Ventura County Transportation Commission (VCTC) Transportation Demand Model
- California Air Resource Boards's (CARB) 2021 EMission FACtor model (EMFAC2021 v1.0.2)

Off-road Equipment

- CARB's OFFROAD model (OFFROAD2021 v1.0.7)

Building Natural Gas

- Southern California Gas (SCG) Natural Gas Report
- Environmental Defense Fund User Guide for Natural Gas Leakage

Building Electricity

- Clean Power Alliance (CPA)
- Southern California Edison (SCE)

Solid Waste Generation

- CalRecycle's Recycling and Disposal Reporting System (RDRS) Report 6

Water Consumption

- Water management data from local water suppliers and Urban Water Management Plans

Wastewater Treatment

- Wastewater management data from local utilities

Agriculture

- California Department of Food and Agriculture (CDFA) 2022 Fertilizer Tonnage Report
- CDFA 2022 Agricultural Resource Report
- United States Department of Agriculture (USDA) 2022 National Agriculture Statistics Service (NASS) Census
- Agriculture burn data from Ventura County Air Pollution Control District

High GWP Sources

- CARB 2022 California GHG Emission Inventory Data

Emission Factors and Default Values

- U.S. EPA Emissions Factors Hub

- U.S. EPA eGRID
- ICLEI Community Protocol
- U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011. Annex 3.11: Methodology for Estimating CH4 and N2O Emissions from Manure Management
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories Chapter 11: N2O Emissions From Managed Soils, and CO2 Emissions From Lime and Urea Application
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4. Agriculture, Forestry and Other Land Use

2.3   Natural and Working Lands Carbon Inventory Methodology

The following section provides a summary of the methodology used to calculate carbon stored in the natural and working lands in the MSA, which can then be used to make land management decisions to maintain, protect, and increase carbon stocks, and as a basis of comparison for future inventories.

2.3.1   Baseline Inventory Year Selection

The inventory incorporates data from several different years, reflecting the best available and most recent datasets for each component of the carbon stock analysis. While the 2023 LANDFIRE dataset was used for land cover classification and serves as the foundation for the spatial distribution of land types, other critical data inputs were sourced from earlier years. Urban tree canopy data were drawn from the 2021 i-Tree Canopy dataset, which remains the most current publicly available estimate of urban forest density. Soil carbon estimates rely on national datasets from the National Cooperative Soil Survey Characterization Database (NASIS) and the Rapid Carbon Assessment, which were last updated in 2017 and currently represent the most comprehensive and reliable sources for jurisdictional-scale soil carbon content.

Due to the varying publication timelines of these datasets, the inventory does not use a single-year baseline. Instead, it represents a composite snapshot of existing carbon stocks using the most recent and robust data available for each carbon pool.

2.3.2   Carbon Inventory Accounting Protocol

To estimate existing carbon stocks within the MSA's natural and working lands, a land-based carbon inventory methodology was applied using the framework established in the *Resilient Counties Guide*, developed in partnership with Merced County, the Nature Conservancy, and the California Department of Conservation. This guide was selected due to its alignment with California's 2022 Climate Change Scoping Plan and its focus on county-scale applicability. Area calculations were developed from ESRI's web-based map applications. Carbon stock was estimated across several carbon pools—including woody and herbaceous biomass and topsoil organic carbon—using land cover classifications and spatial datasets to determine carbon content per acre for each land cover type.

2.3.3   Geographic Scope of Inventory

The geographic scope of the inventory covers the entirety of the MSA, including both incorporated and unincorporated regions within Ventura County. The analysis accounts for all natural and working lands across the study area, as defined by the land cover classifications used in the inventory.

2.3.4   Natural and Working Lands Sectors and Data Sources

Consistent with the QAPP, carbon stock estimates are based on a combination of existing, publicly available spatial datasets:

Land Cover

- LANDFIRE data (2023) at 30-meter resolution, which includes vegetation type, canopy cover, and vegetation height layers. Although national in scope, LANDFIRE data are used in the State's Natural and Working Lands Inventory and were considered the best available for this effort.

Urban Tree Cover

- i-Tree Canopy (2021) was used to estimate tree canopy density in urban areas. This tool applies aerial imagery and randomized sampling to estimate tree cover and is widely used for urban forest analysis.

Soils

- The inventory incorporated national-scale datasets including the National Cooperative Soil Survey Characterization Database, the National Soil Information System (NASIS), and the Rapid Carbon Assessment (RaCA). These datasets provide detailed information on soil carbon and other properties at a 100-meter spatial resolution.

These three sectors (i.e., land cover, urban tree cover, and soils) cover the QAPP-designated sectors, 'land management' and 'urban forestry.' As detailed in the QAPP, the data quality objectives and criteria for this project are accuracy, precision, bias, completeness, representativeness, and comparability. All data sources used were vetted for consistency, relevance, and the latest available publication year. Data were reviewed for completeness and spatial accuracy, and cross-referenced with documentation from the original data providers. GIS analysis and modeling workflows were reviewed internally to facilitate adherence to established methodologies and reproducibility. While LANDFIRE and national soil datasets present some scale limitations, they were used consistently across the inventory to maintain comparability and are considered sufficient for high-level jurisdictional planning and decision-making.

2.4   Inventory Results

A GHG emissions inventory and carbon stock assessment identify the major sources and quantities of GHG sources and sinks within a jurisdiction's boundaries, in this case, the MSA. Estimating emissions sources and sinks enables local governments to establish a baseline, track trends, identify the greatest sources of GHG emissions sources and sinks within their jurisdiction, and set targets for future reduction and sequestration goals.

2.4.1   Community Greenhouse Gas Inventory Results

In 2022, GHG emissions in the MSA (excluding NWL carbon stocks, which are discussed in Section 2.4.2)[38] totaled 6,099,066 MT CO_2e, primarily driven by on-road transportation (45 percent) and building natural gas (19 percent). The remaining sources of GHG emissions quantified for the MSA included building electricity (13 percent), off-road equipment (seven percent), high GWP gas sources (seven percent), solid waste (six percent), agriculture (two percent), and water and wastewater which each contributed less than one percent to total GHG emissions. The results of the 2022 community GHG inventory are shown in Figure 5 and Figure 6, and are summarized in detail in Table 4.

Figure 5   Oxnard-Thousand Oaks-Ventura MSA 2022 Community GHG Emissions by Sector

---
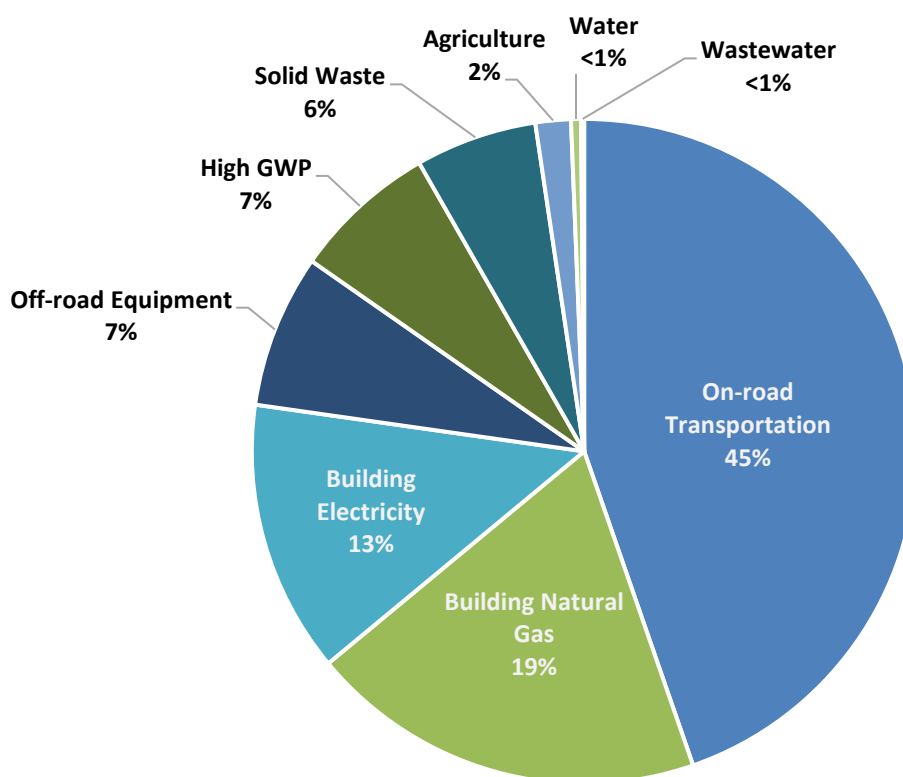
[38] The above and below ground NWL carbon stock total is 22,916,396 MT CO_2e. More details on the Natural and Working Lands carbon inventory can be found in Section 2.4.2.

Figure 6 Oxnard-Thousand Oaks-Ventura MSA 2022 Community GHG Emissions by Sector
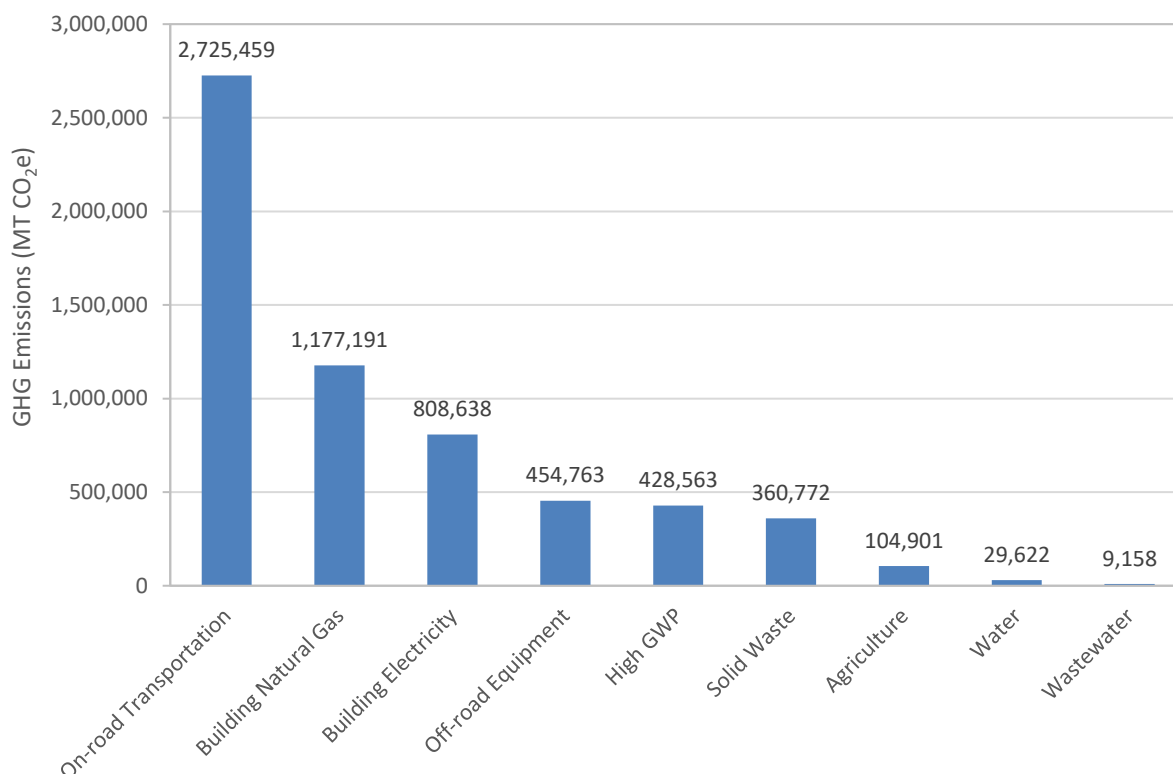
Table 4 Oxnard-Thousand Oaks-Ventura MSA 2022 GHG Emissions Inventory

GHG Emissions Sectors and Subsectors	Activity Data		Emission Factor		GHG Emissions (MT CO$_2$e)
Building Energy					
Residential Electricity	1,679,673,500	kWh	0.000132	MT CO$_2$e/kWh	221,414
Residential Electricity T&D	89,043,733	kWh	0.000132	MT CO$_2$e/kWh	11,738
Commercial Electricity	1,680,872,130	kWh	0.000154	MT CO$_2$e/kWh	259,104
Commercial Electricity T&D	85,725,126	kWh	0.000154	MT CO$_2$e/kWh	13,214
Industrial Electricity	1,089,730,232	kWh	0.000217	MT CO$_2$e/kWh	235,967
Industrial Electricity T&D	55,576,242	kWh	0.000217	MT CO$_2$e/kWh	12,034
Agricultural Electricity	311,154,994	kWh	0.000169	MT CO$_2$e/kWh	52,490
Agricultural Electricity T&D	15,868,905	kWh	0.000169	MT CO$_2$e/kWh	2,677
Residential Natural Gas	101,221,916	therms	0.005311	MT CO$_2$e/therm	537,635
Residential Natural Gas Leaks	2,848,456	therms	0.053067	MT CO$_2$e/therm	151,159
Commercial Natural Gas	40,821,640	therms	0.005311	MT CO$_2$e/therm	216,822
Commercial Natural Gas Leaks	1,148,750	therms	0.053067	MT CO$_2$e/therm	60,961
Industrial Natural Gas	22,820,059	therms	0.005311	MT CO$_2$e/therm	121,208
Industrial Natural Gas Leaks	642,173	therms	0.053067	MT CO$_2$e/therm	34,078
Agricultural Natural Gas	8,130,734	therms	0.005311	MT CO$_2$e/therm	43,186
Agricultural Natural Gas Leaks	228,805	therms	0.053067	MT CO$_2$e/therm	12,142
Sub Total					**1,985,829**

GHG Emissions Sectors and Subsectors	Activity Data		Emission Factor		GHG Emissions (MT CO$_2$e)
Transportation					
Passenger VMT	6,075,124,040	VMT	0.000339	MT CO$_2$e/mile	2,057,798
Commercial VMT	621,300,318	VMT	0.001003	MT CO$_2$e/mile	622,989
Bus VMT	22,583,611	VMT	0.001591	MT CO$_2$e/mile	35,933
Passenger EVMT	66,282,043	kWh	0.000132	MT CO$_2$e/kWh	8,737
Commercial EVMT	0	kWh	0.000154	MT CO$_2$e/kWh	0
Bus EVMT	12,686	kWh	0.000154	MT CO$_2$e/kWh	2
Off-road Diesel	34,878,605	Gallons	0.010450	MT CO$_2$e/gal	364,495
Off-road Gasoline	8,583,480	Gallons	0.009147	MT CO$_2$e/gal	78,510
Off-road Natural Gas	2,005,677	Gallons	0.005862	MT CO$_2$e/gal	11,758
Sub Total					**3,180,222**
Solid Waste					
Landfill Methane	927,434	Wet short tons	0.378000	MT CO$_2$e/ton	350,570
Process Emissions	927,434	Wet short tons	0.011000	MT CO$_2$e/ton	10,202
Sub Total					**360,772**
Wastewater[1]					
Centralized Process Emissions	Please see Appendix A Greenhouse Gas Inventory Analysis Report for activity data and emissions factors.				1,442
Stationary Combustion					65
Effluent Discharge					2,529
Septic Systems					5,122
Sub Total					**9,158**
Water[2]					
Imported Water	130,784,227	kWh	0.000226	MT CO$_2$e/kWh	29,622
Sub Total					**29,622**
Agriculture[3]					
Enteric Fermentation	Please see Appendix D Natural Working Lands Report for activity data and emissions factors.				15,240
Manure Management					878
Soil Management					88,402
Biomass Burning					381
Sub Total					**104,901**
High GWP					
Multiple	843,200	persons	0.508	MT CO$_2$e/person	428,563
Sub Total					**428,563**
Total					**6,099,066**

Notes: VMT = vehicle miles traveled; EVMT = electric vehicle miles traveled; kWh = kilowatt hour; MT CO$_2$e = Metric tons of carbon dioxide equivalent; gal = gallons; all GHG emissions quantification methodologies can be found in the community and agriculture GHG inventory technical reports.

1. The wastewater sector only includes non-energy-related emission sources; wastewater collection and treatment energy emissions are not added to the total as these are captured under the building energy sector. Wastewater activity data and emission factors are not listed due to the varying units and equations used for wastewater calculations.

2. The water sector only includes imported water electricity emissions; local groundwater pumping and water distribution electricity emissions are not added to the total as these are captured under the building energy sector.

3. The agriculture GHG Inventory does not include offroad fuel use or energy consumption as these are captured under the community offroad and building energy sectors, respectively. Agriculture activity data and emission factors are not listed due to the varying units and equations used for agriculture calculations.

2.4.2   Natural and Working Lands Carbon Inventory Results

The carbon stock inventory for natural and working lands in the MSA encompasses 1,184,625 acres. The land cover making up the largest proportion of the MSA is Shrub/Scrub (56 percent), followed by Forest (15 percent), Developed (12 percent), Grassland/Herbaceous (six percent), Orchard (five percent), Cultivated and Field Crops (three percent), and Barren (two percent). The remaining land cover classes[39] represent less than one percent of the total land cover.

Forest land cover holds the most carbon stock/acre at 113 MT CO_2e/acre, though shrub/scrub holds the most total carbon stock overall (54,438,099 MT CO_2e/acre) due to this specific land cover's prominence in the MSA (661,314 acres). The carbon stock associated with each land cover type, including all above- and below- ground biomass and soil carbon can be found below in Table 5, as well as Figure 7 and Figure 8. More information can be found in Appendix D Natural Working Lands Report.

Table 5   Oxnard-Thousand Oaks-Ventura MSA Carbon Stock by Land Cover Class

Land Cover Class	Total Carbon Stock/ Acre (MT CO_2e)	Total Planning Area Acreage	Total Carbon Stock (MT CO_2e)
Forest	113	175,498	19,910,315
Shrub/Scrub	82	661,314	54,438,099
Wetland	74	2,666	196,372
Cultivated and Field Crops	69	39,854	2,749,244
Orchard	61	55,138	3,342,458
Pasture and Hay	60	5,709	339,974
Grassland/Herbaceous	55	68,226	3,721,118
Developed	54	140,628	7,615,659
Vineyard	53	145	7,755
Barren	53	28,456	1,504,089
Open Water	53	6,989	214,845
Total	**704**	**1,184,625**	**94,039,928**

MT CO_2e = metric tons of carbon dioxide equivalent.

Note: Values have been rounded to the nearest whole number therefore sums may not match.

---

[39] Remaining land cover classes, from largest to smallest, include: open water, pasture and hay, wetlands, and vineyards.

Figure 7   Oxnard-Thousand Oaks-Ventura MSA Total Carbon Stock (MT CO$_2$e) by Land Cover Class
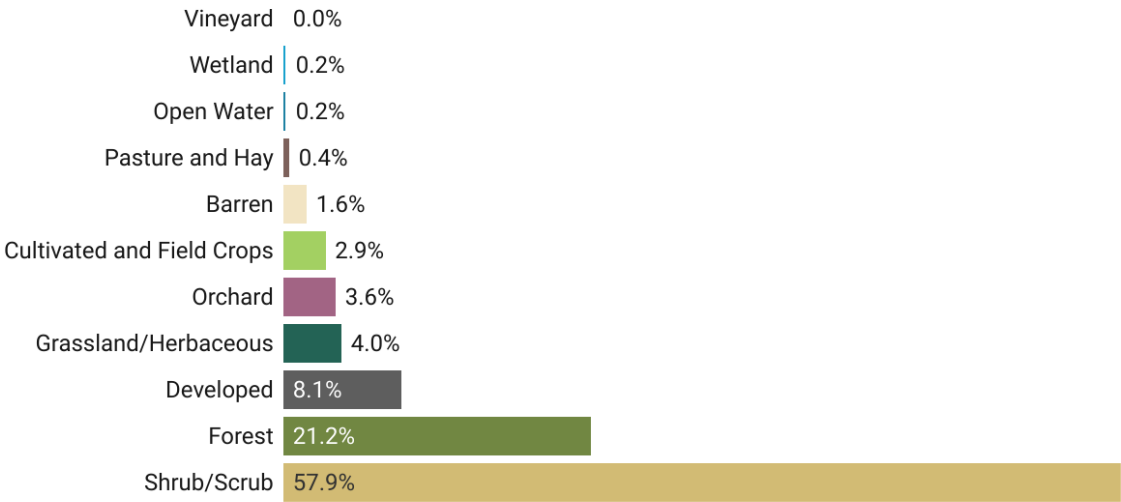
Figure 8 Oxnard-Thousand Oaks-Ventura MSA Total Carbon Stock

2.5 Inventory Trends and Analysis

The MSA does not currently have historical communitywide GHG inventories available to assess local emissions trends over time. As a result, this CCAP uses the 2022 inventory as a baseline to inform emissions reduction strategies and track future progress.

In the absence of local trend data, statewide emissions trends offer useful context. California's GHG emissions have generally declined since their peak in 2004, falling approximately 16 percent by 2021 despite continued population and economic growth.[40] Much of this reduction is attributed to decarbonization of the electricity sector, including a significant increase in renewable energy generation and the retirement of coal-fired power plants. Emissions from the electricity sector have declined by over 40 percent since 2000 statewide.

Transportation remains the largest source of GHG emissions in California, and while fuel efficiency improvements and the adoption of electric vehicles have helped offset some growth in VMT, emissions from this sector remain relatively steady and are more difficult to decouple from economic and population growth. In 2020, transportation emissions fell sharply due to pandemic-related restrictions but rebounded in 2021 as activities resumed. Similar patterns were observed in the commercial and industrial sectors.

These broader trends likely reflect similar patterns in the MSA, particularly given the region's reliance on on-road transportation, imported electricity, and natural gas in buildings. Continued decarbonization of the grid and expansion of zero-emission vehicles are expected to drive significant emissions reductions in the coming years, while land use decisions, energy efficiency improvements, and waste diversion strategies will also be key to achieving long-term goals. As additional inventories are developed over time, the MSA will be better positioned to evaluate local emissions trends and track progress toward climate goals.

---

[40] California Air Resources Board (CARB). GHG 1990-2004 Inventory & Documentation. Accessed on June 25, 2025, at: https://ww2.arb.ca.gov/ghg-1990-to-2004

3   Greenhouse Gas Emissions Projections and Targets

The MSA's baseline GHG emissions inventory establishes a reference point for 2022. However, annual GHG emissions change over time. The MSA's emissions forecast estimates future GHG emission changes by accounting for a continuation of current activities and projected community growth and then accounting for GHG emissions reduction expected from currently adopted legislation. The forecast provides details on the emissions reduction required to meet the GHG emissions targets. This section includes an estimate of the future emissions the MSA will generate in the years 2030, 2035, 2040, and 2045 in a *business-as-usual scenario* (BAU) forecast and a *legislative-adjusted scenario* (adjusted) forecast that are defined as follows:

- **Business-as-usual scenario**: Provides a forecast of how future GHG emissions would change if current activities continued as they did in 2022 absent of any policies or legislation that would reduce local emissions. The BAU forecast is based on growth trends projected in population, housing, employment, and transportation activity over time within the MSA.

- **Legislative-adjusted scenario**: Provides a forecast of how legislation would reduce GHG emissions in the MSA from the business-as-usual scenario. The legislative-adjusted scenario represents the State's contribution to reducing local GHG emissions to meet California's goals without any additional contribution from local policies or actions.

The adjusted forecast incorporates the impact of State regulations that provide GHG emissions reduction potential to offer a more accurate picture of future GHG emissions growth.[41] The adjusted scenario is what the CCAP then uses to conduct a gap analysis and identify the remaining emissions that need to be reduced through local action in order to achieve the established GHG reduction targets. These actions are outlined in Section 4.

3.1   Business-as-Usual Greenhouse Gas Emissions Projections

3.1.1   Business-as-Usual Projection Methodologies

Forecasting future emissions is a critical step in understanding the potential climate impacts from changes within the MSA and identifying opportunities for emissions reductions. By projecting how emissions may evolve through 2045, based on expected trends in population, housing, and employment, the MSA can better evaluate the effectiveness of climate action strategies and inform sustainable policies.

BAU GHG emissions were calculated by multiplying projected activity data with the baseline emission factors utilized in the 2022 MSA GHG emissions inventory. Several change rates were developed from demographic projections (i.e., population, employment, and households) and applied to 2022 activity data to project future emissions trends. Demographics are based on

---

[41] The adjusted forecast includes the estimated impact of existing State and federal regulations; however, the future of certain regulations remains uncertain due to recent federal actions that have rescinded waivers or approvals previously granted by the U.S. EPA. While California and other states are pursuing legal action to defend these regulations, the outcome remains unresolved at the time of this report.

projected estimates sourced from Southern California Association of Governments' (SCAG) Connect SoCal 2024 report.[42] Demographics projections can be found in Table 6.

Table 6   Oxnard-Thousand Oaks-Ventura MSA BAU Forecast Demographic and Projection Metrics by Forecast Year

Metric	Data Source	2022	2030	2035	2040	2045	% Change [2022-2045]
Population[1]	Connect SoCal 2024[2]	843,200	849,000	858,000	861,000	858,000	1.76%
Employment	Connect SoCal 2024	367,000	379,000	384,000	383,000	380,000	3.54%
Households[1]	Connect SoCal 2024	285,600	307,000	318,000	321,000	321,000	12.39%

[1] Population and household projection data for 2022 are estimated based on a linear interpolation between 2019 and 2025 data points (not shown but sourced from SoCal Connect 2024) and the assumption that the demographic change remains constant through 2025.

[2] Southern California Association of Governments (SCAG). April 4, 2024. Connect SoCal 2024. Demographics & Growth Forecast Technical Report. Accessed June 17, 2025, at: https://scag.ca.gov/sites/default/files/2024-05/23-2987-tr-demographics-growth-forecast-final-040424.pdf

Change factors were not applied to the transportation sector due to the availability of existing transportation data models. On-road transportation passenger and commercial vehicle miles traveled (VMT) projections were provided by the VCTC,[43] and off-road fuel use was projected using data provided in the CARB OFFROAD model.[44] Additionally, change factors were not applied to the agriculture sector as this sector is assumed to remain constant at 2022 emissions levels through 2045. This is a conservative assumption since it is expected that agriculture activity in the MSA will remain stable or decline in future years. Figure 9 below presents an example of how 2022 activity data was combined with demographic projections to project future activity trends.

---

[42] Southern California Association of Governments (SCAG). April 4, 2024. Connect SoCal 2024. Demographics & Growth Forecast Technical Report. Accessed June 17, 2025, at: https://scag.ca.gov/sites/default/files/2024-05/23-2987-tr-demographics-growth-forecast-final-040424.pdf

[43] Ventura County Transportation Commission (VCTC). Ventura County Transportation Model. Accessed June 17, 2025, at: https://www.goventura.org/work-with-vctc/traffic-model/

[44] California Air Resource Board (CARB). 2024. Mobile Source Emissions Inventory Off-road (OFFROAD2021 v1.0.7). Accessed June 17, 2025, at: https://arb.ca.gov/emfac/offroad/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

Figure 9   Change Factors

2022 Projections

2022 Activity Data $\div$ 2022 Demographics = Change Factor

↓

Change Factor $\times$ Projected Demographics = Projected Activity Data

Residential Natural Gas Example

100 therms $\div$ 10 households = 10 therms/household

↓

10 therms/household $\times$ 15 households in 2030 = 150 therms in 2030
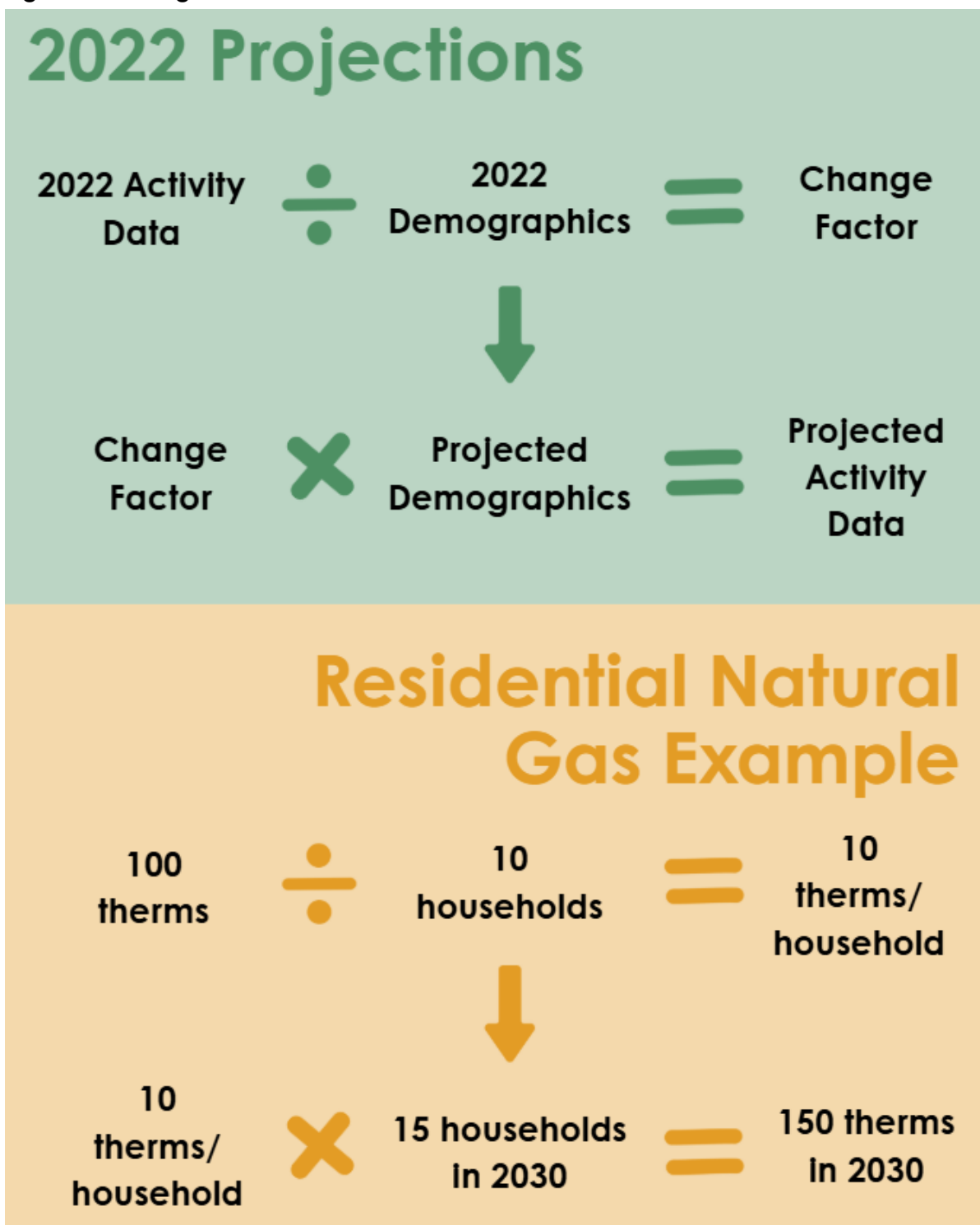
Therm = a unit of heat equivalent to 100,000 Btu (used to measure natural gas quantity)

3.1.2   Business-as-Usual Projection Results

The results of the BAU forecast show an increase in GHG emissions in all reported GHG emissions sectors, which are directly influenced by projected growth in the MSA. Table 7 provides a summary of the BAU GHG emissions results for each GHG emissions sector for 2030, 2035, 2040, and 2045.

Table 7   Oxnard-Thousand Oaks-Ventura MSA BAU Forecast Results by Emissions Sector

GHG Emissions Source	2022	2030	2035	2040	2045
Energy	**1,985,828**	**2,089,654**	**2,139,635**	**2,146,410**	**2,137,708**
Residential Electricity	221,414	238,005	246,533	248,858	248,858
Nonresidential Electricity	547,560	565,464	572,924	571,432	566,956
Residential Electricity T&D Losses[1]	11,738	12,575	13,005	13,118	13,113
Nonresidential Electricity T&D Losses[1]	547,560	565,464	572,924	571,432	566,956
Residential Natural Gas Consumption	537,635	577,920	598,627	604,275	604,275
Nonresidential Natural Gas Consumption	381,216	393,681	398,874	397,835	394,719
Residential Natural Gas Leaks	151,159	162,485	168,307	169,895	169,895
Nonresidential Natural Gas Leaks	107,181	110,685	112,146	111,854	110,977
Transportation	**3,180,222**	**3,240,970**	**3,280,011**	**3,322,445**	**3,360,744**
Passenger Total VMT	2,066,535	2,026,476	2,001,440	1,976,403	1,951,367
Commercial Total VMT	622,989	694,753	739,606	784,458	829,311
Buses Total VMT	35,935	40,075	42,662	45,249	47,836
Off-road Equipment	454,763	479,666	496,304	516,335	532,230
Solid Waste	**360,772**	**366,078**	**370,252**	**370,848**	**369,059**
Solid Waste Disposal	360,772	366,078	370,252	370,848	369,059
Wastewater	**9,158**	**9,293**	**9,399**	**9,414**	**9,368**
Wastewater Process and Fugitive Emissions	9,158	9,293	9,399	9,414	9,368
Water	**29,622**	**30,058**	**30,401**	**30,450**	**30,303**
Imported Water Supply	29,622	30,058	30,401	30,450	30,303
High GWP	**428,563**	**431,511**	**436,085**	**437,610**	**436,085**
High GWP Sources	428,563	431,511	436,085	437,610	436,085
Agriculture[2]	**104,901**	**104,901**	**104,901**	**104,901**	**104,901**
Agricultural Activities	104,901	104,901	104,901	104,901	104,901
Total GHG Emissions	**6,099,066**	**6,272,465**	**6,370,683**	**6,422,078**	**6,448,169**

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e).

[1] Following inventory methodology as detailed in Appendix A Greenhouse Gas Inventory Analysis Report, T&D losses and natural gas leaks are calculated from the forecasted consumption.

[2] Due to limitations in agricultural projection data and the assumption that most agricultural land in the MSA is already in use, agricultural emissions are expected to remain constant through 2045.

A summary of the demographics, projection metrics, and associated change factors for each sector for each forecast year in the BAU forecast are provided in Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

3.2 Legislative-Adjusted Greenhouse Gas Emissions Projections

3.2.1 Legislative-Adjusted Projection Methodologies

Several regulations have been adopted that would reduce the MSA's GHG emissions below the BAU forecasted levels in 2030, 2035, 2040, and 2045. The impact of these regulations was quantified and incorporated into the adjusted forecast to provide a depiction of future emissions growth and the GHG emissions reduction responsibility of the MSA. Legislation included in the adjusted forecast reduces GHG emissions associated with transportation, building efficiency and renewable electricity. A brief description of each regulation and the methodology used to calculate associated reductions is provided below, as well as a description of why specific legislation was included or excluded from this forecast analysis.

Transportation Legislation

The following programs and legislative requirements support emissions reductions from the transportation sector.

Advanced Clean Cars Program

In January 2012, the California Air Resources Board (CARB) approved a new emissions-control program (the Advanced Clean Cars program) combining the control of smog, soot causing pollutants, and GHG emissions into a single coordinated package of requirements for passenger cars and light trucks model years 2017 through 2025. The 2012 standards will reduce California's GHG emissions by 34 percent in 2025 and are modeled under the CARB EMFAC2021 Model and included in this GHG forecast.[45]

Advanced Clean Cars II was approved by CARB in August 2022 and expands the program's roadmap so that by 2035 all new cars and passenger trucks sold in California will be zero-emission vehicles (ZEV).[46] While these legislations will lead to an expedited timeline for ZEV adoption in California, modeling data is not yet available in CARB's EMFAC Model, and emissions reductions attributable to the Advanced Clean Cars II program were, therefore, excluded from this GHG forecast. Advanced Clean Cars I is included in the EMFAC model and includes some CEC market trend forecasts for EV adoption.

---

[45] California Air and Resource Board (CARB). 2022. Advanced Clean Cars Summary. Accessed June 17, 2025, at: https://ww2.arb.ca.gov/sites/default/files/2022-12/acc%20summary-final_ac.pdf

[46] Enforcement of the Advanced Clean Cars II Program (2022) and Advanced Clean Trucks (2020) remain uncertain at the time of this report's preparation. On June 12, 2025, House Joint Resolution 87 and 88 were signed into law nullifying the U.S. EPA's notices which granted CARB's requests for the regulations. The future of implementation remains unclear as California pursues legal action against the resolutions.

Advanced Clean Trucks was approved by CARB in June 2020 that sets a ZEV percent-of-sales requirement on medium- and heavy- duty vehicle manufacturers to promote increased truck ZEV sales from 2024 to 2035.[47] EMFAC models the effect of the Advanced Clean Trucks regulation on ZEV truck penetration and associated GHG emissions and is included in this forecast.

Assembly Bill 1493

Signed into law in 2002, AB 1493 (Pavley Standards) required vehicle manufacturers to reduce GHG emissions from new passenger vehicles and light trucks from 2009 through 2016. The impacts of the Pavley Standards on zero emission vehicle market penetration were incorporated into the EMFAC model starting in 2014 and are included in this forecast.

Innovative Clean Transit

Public transit GHG emissions will be reduced in the future through the Innovative Clean Transit (ICT) regulation, which was adopted in December 2018. The effects of the ICT regulation on GHG emissions are modeled in EMFAC2021 and are included in this forecast.

Energy Legislation

The following programs and legislative requirements support emissions reductions from the energy sector.

Title 24, Building Efficiency Standards

In December 2022 the California Energy Commission (CEC) published the new Title 24 2022 Building Efficiency Standards.[48] Due to the complexity of the new code, there is currently no available model establishing projected efficiency increase as a result of the standard; therefore, the 2019 code, of which established efficiency models exist, was included to provide a conservative estimate of forecasted GHG emissions reductions resulting from efficiency increases.

Renewables Portfolio Standard, Senate Bill 100, and Senate Bill 1020

Established in 2002 under SB 1078, enhanced in 2015 by SB 350, and accelerated for the first time in 2018 under SB 100, California's Renewable Portfolio Standard (RPS) requires investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2026 and 60 percent of total procurement by 2030. The RPS program further requires that by 2045 that 100 percent of total energy procured be a combination of eligible renewable energy resources and zero-carbon resources.

California's RPS was further accelerated in 2022 by SB 1020 that established additional requirements that procurement from eligible renewable energy resources and zero-carbon resources increase to 90 percent of total procurement by 2035 and 95 percent of total procurement by 2040. The RPS program and SB 1020 were incorporated into this GHG forecast by adjusting the electricity emissions factors for future years.

---

[47] See footnote above.

[48] California Energy Commission (CEC). 2023. 2022 Building Energy Efficiency Standards. Accessed June 17, 2025, at:
https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency

Waste Legislation

The following programs and legislative requirements support emissions reductions from the waste sector.

Assembly Bill 939 and Assembly Bill 341

In 2011, AB 341 set the target of 75 percent recycling, composting, or source reduction of solid waste by 2020 calling for the California Department of Resources Recycling and Recovery (CalRecycle) to take a statewide approach to decreasing California's reliance on landfills. As actions under AB 341 are not assigned to specific local jurisdictions, potential future reductions from the bill were conservatively not included in this forecast.

Assembly Bill 1826

In 2014, AB 1826 set regulations in place requiring California businesses to recycle all of their organic waste starting in April 2016. The bill also required jurisdictions across the State to provide organic waste recycling programs to accommodate diverted waste from local businesses. As Ventura County has already implemented an organics collection program, implementation of AB 1826 compliance is reflected in the MSA's 2022 community inventory solid waste activity data and is also included in this forecast.

Senate Bill 1383

SB 1383 established a methane emission reduction target for short-lived climate pollutants in various sectors of the economy, including waste. Specifically, SB 1383 establishes targets to achieve a 50 percent reduction in the level of the Statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025.[49] Additionally, SB 1383 requires a 20 percent reduction in "current"[50] edible food disposal by 2025. Although SB 1383 has been signed into law, compliance must occur at the local jurisdiction level rather than the State level. Due to current limitations in local jurisdictions' ability to comply with organic waste targets set by SB 1383, anticipated emissions reductions attributable to the bill are conservatively excluded from this forecast.

Additional information on the adjusted forecast scenario methodology and data sources can be found in Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

High-Global Warming Potential Legislation

Senate Bill 1206

In 2022, SB 1206 established legislation to reduce emissions from hydrofluorocarbons (HFCs), potent synthetic GHGs used primarily as refrigerants in cooling equipment. The legislation prohibits the sale of bulk virgin HFCs while allowing the sale of reclaimed HFCs. Although this legislation puts California on track to mitigate emissions from most existing sources that use HFCs, this legislation is conservatively excluded from the legislative-adjusted forecast due to data limitations. Because it is

---

[49] CalRecycle. California's Short-Lived Climate Pollutant Reduction Strategy. Accessed June 17, 2025, at: https://calrecycle.ca.gov/organics/slcp/

[50] SB 1383 does not specify a baseline year for the 20 percent food recovery target. However, CalRecycle's 2018 Statewide waste characterization studies was used to help measure the baseline for the State to meet its SB 1383 goals.
CalRecyle. Food Recovery Questions and Answers. Accessed June 17, 2025, at:
https://calrecycle.ca.gov/organics/slcp/faq/foodrecovery/#:~:text=SB%201383%20requires%20the%20state,for%20individual%20jurisdictions%20to%20achieve.

not known which HFCs are used within the MSA nor which alternatives will be used in substitute, estimating a reductions schedule is not possible at this time.

Legislative Greenhouse Gas Emissions Reduction Contribution

The regulations in the legislative programs described in the previous section inform the calculation of weighted emissions factors for affected sectors, such as Energy and Transportation. The overall impact of the legislative programs would be to reduce the MSA's total GHG emissions below the BAU forecasted levels in 2030, 2035, 2040 and 2045. Table 8 summarizes the emissions reductions from the BAU forecast that can be expected under the adjusted forecast for the MSA.

Table 8   Oxnard-Thousand Oaks-Ventura MSA Legislative GHG Emissions Reductions Summary

Metric	2030	2035	2040	2045
California RPS	181,598	737,047	846,313	950,036
Title 24	17,570	27,349	28,851	27,800
Transportation Legislation (Advanced Clean Cars Program, Pavley Standards, Innovative Clean Transit)	517,522	749,188	891,661	972,012
Total	716,690	1,513,584	1,766,824	1,949,848

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e).

Appendix B Greenhouse Gas Emissions Forecast and Targets Report contains further details on the California legislation and adjusted emissions factors that guide this scenario.

3.2.2   Legislative-Adjusted Projection Results

Table 9 presents a detailed forecast of projected GHG emissions for the MSA under the legislative-adjusted scenario, broken down by sector and year through 2045. Emissions from the energy sector show an overall reduction driven by a sharp downward trend in electricity emissions which are projected to be zero by 2045, due to SB 100/1020 requirements. Emissions from water also decrease since they are driven by electricity consumption. However, this progress is partially offset by increasing natural gas consumption as the population rises. Transportation emissions are expected to decrease due to existing fuel efficiency standards and a growing EV adoption. Emissions in other sectors like wastewater, solid waste, and high-GWP sources are projected to rise along with population.

Table 9   Oxnard-Thousand Oaks-Ventura MSA Adjusted Scenario Forecast Results by Emissions Sector

GHG Emissions Source	2022	2030	2035	2040	2045
Energy	1,985,828	1,906,181	1,440,942	1,362,237	1,273,890
Residential Electricity[1]	233,152	223,947	57,013	28,651	0
Nonresidential Electricity[1]	575,486	441,075	111,444	55,703	0
Residential Electricity T&D Losses[2]	11,738	11,852	3,062	1,549	0
Nonresidential Electricity T&D Losses[2]	547,560	419,356	105,817	52,811	0
Residential Natural Gas	537,635	575,100	594,358	599,610	599,610

GHG Emissions Source	2022	2030	2035	2040	2045
Nonresidential Natural Gas	381,216	393,681	398,874	397,835	394,719
Residential Natural Gas Leaks	151,159	161,693	167,107	168,584	168,584
Nonresidential Natural Gas Leaks	107,181	110,685	112,146	111,854	110,977
Transportation	**3,180,222**	**2,769,707**	**2,564,362**	**2,456,424**	**2,402,238**
On-road Passenger Vehicles	2,066,535	1,648,017	1,482,632	1,400,914	1,352,421
On-road Commercial Vehicles	622,989	606,813	552,608	518,271	505,647
On-road Buses	35,935	35,212	32,819	20,904	11,941
Off-road Equipment	2,066,535	1,648,017	1,482,632	1,400,914	1,352,421
Solid Waste	**360,772**	**366,078**	**370,252**	**370,848**	**369,059**
Solid Waste Disposal	360,772	366,078	370,252	370,848	369,059
Wastewater	**9,158**	**9,293**	**9,399**	**9,414**	**9,368**
Wastewater Process and Fugitive Emissions	9,158	9,293	9,399	9,414	9,368
Water	**29,622**	**18,184**	**4,598**	**2,303**	**0**
Imported Water Supply[1]	29,622	18,184	4,598	2,303	0
High GWP	**428,563**	**431,511**	**436,085**	**437,610**	**436,085**
High GWP Sources	428,563	431,511	436,085	437,610	436,085
Agriculture	**104,901**	**104,901**	**104,901**	**104,901**	**104,901**
Agricultural Activities	104,901	104,901	104,901	104,901	104,901
Total GHG Emissions	**6,099,066**	**5,605,855**	**4,930,538**	**4,743,736**	**4,595,542**

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e).

[1] Emissions are estimated to reduce to zero MT CO_2e due to RPS requirements established by SB100 and SB1020 which specify electricity must be procured from 100 percent renewable and carbon free sources by 2045.

[2] Following inventory methodology as detailed in Appendix A Greenhouse Gas Inventory Analysis Report, T&D losses and natural gas leaks are calculated from the forecasted consumption.

3.3 Near-Term and Long-Term Greenhouse Gas Reduction Targets

GHG reduction targets are used in climate action planning to establish metrics that guide a community's commitment to achieve GHG emissions reductions and help gauge progress reducing GHG emissions over time. Both the federal and state governments can establish goals to reduce emissions, however, these goals may not always directly align with each other. For example, California has established statewide GHG reduction goals for 2030 and 2045, relative to a baseline emissions level. The CARB 2022 Scoping Plan encourages local agencies to take ambitious, coordinated climate action that is consistent with and supportive of the State's climate goals.[51] Thus, local agencies are recommended to create equivalent reduction targets at the local level by establishing communitywide GHG reduction goals for climate action that will help California achieve its 2030 and 2045 goals. The federal goals are 61-66 percent reduction in 2035 from 2005 levels in

[51] California Air Resources Board (CARB). 2022. California's Climate Change Scoping Plan, p.268. Accessed on June 17, 2025, at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

economy-wide net GHG emissions and net-zero emissions by no later than 2050.[52] Although the CCAP is funded by the U.S. EPA and supports federal climate goals, the targets established align with California's more ambitious requirements and support the various jurisdictions within the MSA's established goals.

In the most recent 2022 Scoping Plan, target years include 2030 (SB 32 consistency) and 2045 (AB 1279).[53] SB 32 mandates a reduction of GHG emissions by 40 percent below 1990 levels by 2030 and AB 1279 mandates a Statewide goal of carbon neutrality by 2045 through a reduction of anthropogenic GHG emissions by 85 percent below 1990 levels. AB 1279 sets a 15 percent target for GHG emissions reductions to be achieved through carbon removal methods, though does not provide a clear pathway as to how carbon removal is to be implemented to achieve said reductions. Therefore, provisional targets established herein align with the carbon neutrality goal set by AB 1279 until a clear mechanism for carbon removal reduction is established by the State.

Pursuant to California's Scoping Plan recommendations, the MSA GHG reduction targets will be developed based on local levels of GHG emissions that would be proportional to statewide goals, relative to 1990[54] level emissions.[55] Statewide GHG goals can be found in Figure 10 below.

---

[52] The White House. December 19, 2024. FACT SHEET: President Biden Sets 2035 Climate Target Aimed at Creating Good-Paying Union Jobs, Reducing Costs for All Americans, and Securing U.S. Leadership in the Clean Energy Economy of the Future. Accessed June 16, 2025 at: https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2024/12/19/fact-sheet-president-biden-sets-2035-climate-target-aimed-at-creating-good-paying-union-jobs-reducing-costs-for-all-americans-and-securing-u-s-leadership-in-the-clean-energy-economy-of-the-future/

[53] CARB. 2022. California's Climate Change Scoping Plan, Appendix D – Local Actions, p.14. Accessed on June 17, 2025, at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

[54] More details on data sources and methodology for estimating the MSA's 1990 level emissions can be found in Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

[55] The MSA understands that the U.S. EPA has established goals for 2030 and 2050, however, most jurisdictions in the MSA have already adopted targets that reach beyond 2050 and aim for carbon neutrality by 2045 in line with the state's goals. Therefore, although this project is funded by the U.S. EPA, the goals included for emissions reductions align with the state of California, as they are currently more stringent.

Figure 10 Statewide Goals

> To support California's climate goals and existing targets in many of the jurisdiction's individual climate planning documents, the MSA is establishing GHG reduction targets aligned with SB 32 and AB 1279. These statewide goals require:

40% reduction below 1990 levels by 2030 (SB 32)

Carbon neutrality by 2045, with 85 percent of reductions from direct GHG mitigation and up to 15 percent from CCS (AB 1279)

The goal of setting GHG reduction targets is to establish a clear, cost-effective path toward meeting California's 2030 target of reducing emissions 40% below 1990 levels (SB 32) and ultimately achieving carbon neutrality by 2045 (AB 1279). Accordingly, the MSA has adopted targets for reducing emissions 40% below 1990 levels by 2030 (near-term) and making substantial progress toward carbon neutrality by 2045 (long-term). These targets define the local emissions reduction gap, calculated as the difference between the projected future emissions and the reduction goals, as summarized in Table 10.

Table 10 Oxnard-Thousand Oaks-Ventura MSA's GHG Emissions Reduction Targets and Gap Analysis Summary

Emissions Forecast or Pathway	2022	2030	2035	2040	2045
MSA Mass Emissions Target Pathway Scenario					
Adjusted Forecast (State Legislation)	6,099,066	5,605,855	4,930,538	4,743,736	4,595,542
SB 32 Mass Emissions Target Pathway[1]	6,099,066	4,347,736	2,898,491	1,449,245	0
Remaining Emissions Gap	0	1,258,118	2,032,047	3,294,491	4,595,542

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent. Emissions have been rounded to the nearest whole number and therefore sums may not match.
1. The target pathway is calculated by reducing 1990 mass emissions by 40% in 2030 and to 0 in 2045. This provisional target pathway is consistent with both SB 32 and a trajectory set forth to achieve AB 1279.

Figure 11 provides visual representation of future GHG emissions for the MSA, with the State legislative 2030 target and the remaining gaps for which the MSA will be responsible to meet noted. Full details of the reduction targets are further discussed in Appendix B Greenhouse Gas Emissions Forecast and Targets Report.

Figure 11 Oxnard-Thousand Oaks-Ventura MSA GHG Emissions Forecast and Target Pathway
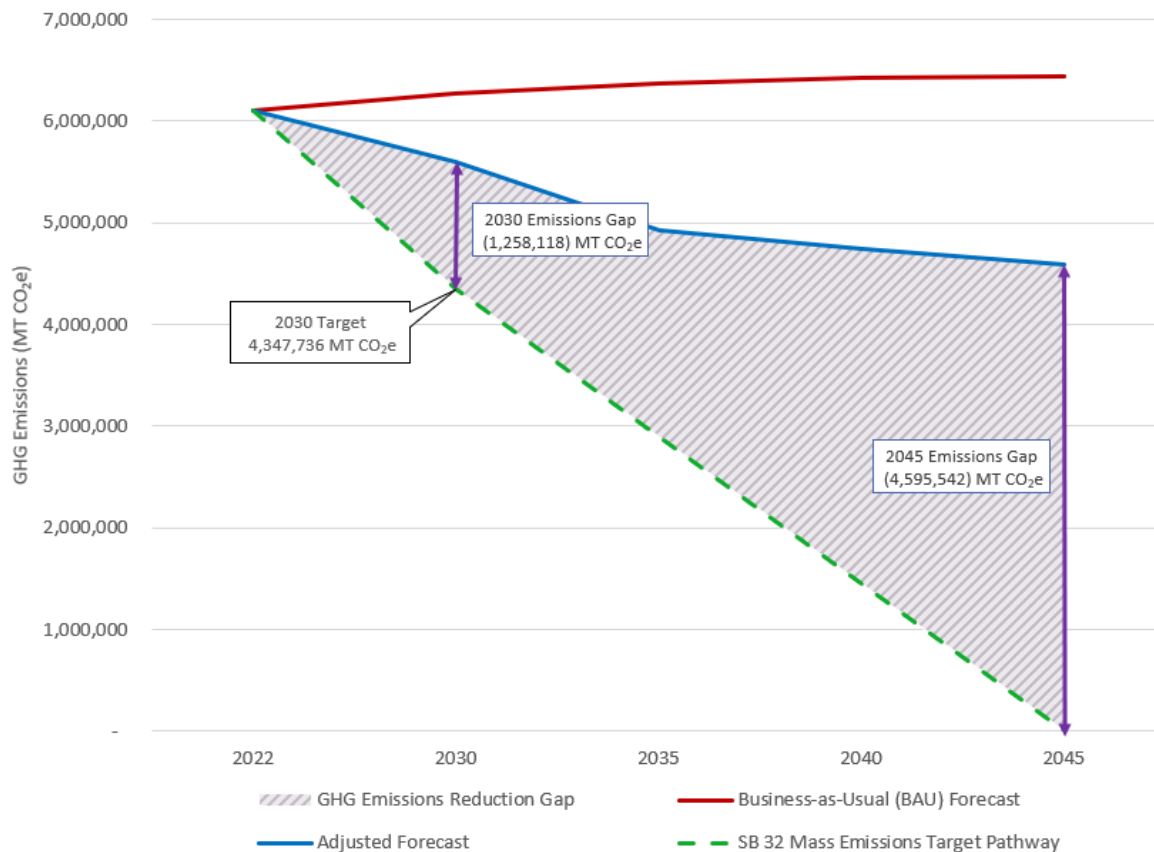
Section 4 presents the measures and actions through which the MSA will implement to achieve the 2030 target. While the measures and actions make substantial progress towards the 2045 target, the pathway to carbon neutrality will be achieved through future updates to the CCAP as new technologies become available and new legislation is passed.

4 GHG Emissions Reduction Measures and Implementation Scenario Projections

4.1 Greenhouse Gas Emissions Reduction Measures Summary

The full suite of implementation measures identified in this section address the main GHG emission sectors in the MSA: transportation and mobility, building energy,[56] waste management, water and wastewater, and agriculture and NWLs. The measures included have been identified in collaboration with the MSA's CPRG Advisory Group and represent key steps to help the region meet the established GHG emissions reduction targets and avoid worsening impacts from climate change. The comprehensive measures included in this CCAP meet the following criteria:

- Address key GHG emission sources, including electricity generation and use; transportation and mobility; commercial, industrial, and residential buildings; agriculture and NWLs; water and waste management; and solid waste management.
- Include quantified estimates of GHG emissions reduction or enhancements of carbon sinks to demonstrate measurable climate benefits.
- Identify an implementation schedule for each measure.
- Establish specific milestones and metrics to track progress throughout implementation, such as policy adoption, program launches, or infrastructure deployment.
- Identify geographic areas of implementation, if applicable.
- Specify whether implementation authority currently exists or outline steps needed to obtain such authority.
- Identify potential funding sources for successful implementation of measures.
- Identify qualitative cost estimates for each measure.
- The measure advances the following County of Ventura priorities, as outlined in the County's Strategic Plan:[57]
  - Healthy, Safe, and Resilient Communities
  - Fiscal Responsibility and Economic Vitality
  - Reliable Infrastructure and Sustainability
  - Address Homelessness and Lift Up the Most Vulnerable
  - Diverse and Innovative Workforce Dedicated to Service Excellence

Table 11 summarizes the MSA's CCAP measures including the estimates of GHG emissions reduction through 2030 and 2045 and near term (2030) implementation metrics. The measures included in this document detail achievable and implementable GHG emissions reduction efforts that will help the MSA reduce its emissions to meet targets established as part of the CCAP and in line with the State of California goals of reaching carbon neutrality no later than 2045 and reducing

---

[56] High GWP emission sources, predominantly from industrial processes, are captured under the building energy sector.

[57] County of Ventura. 2023. County of Ventura Strategic Plan 2024 – 2027. Accessed June 17, 2025, at: https://vcportal.ventura.org/CEO/docs/publications/Ventura-County_Strategic-Plan_2024-2027_v20231023.pdf

anthropogenic emissions 85 percent below 1990 levels by 2045, as well as meeting the interim 2030 goal of reducing emissions by at least 40 percent below 1990 levels. The measures and supporting actions are organized by sector and, when implemented, will help put the MSA on a path towards reaching its climate goals. The strategies are organized in the following framework:

- **Sectors**. Sectors define the GHG emissions category in which the GHG reductions will take place and include Cornerstone, Transportation and Mobility, Building Energy, Waste Management, Water and Wastewater, and Agriculture and NWL.
  - **Measure**. Measures are long-range goals that the MSA has established to ultimately reduce emissions in line with the emissions reduction goals.
  - **Action**. Actions are the discrete steps the MSA will take to achieve the measures.
  - **Strategic Pillars**. For each action, strategic pillars are assigned to help confirm that the actions for each measure cover the full breadth of required themes for successful implementation.

Table 11 describes the key measures and actions identified to support the MSA in achieving both its near-term and long-term emissions reduction targets. These measures and actions encourage coordination across the MSA and demonstrate the MSA jurisdictions' commitment to meeting the goals. Further discussion of measure development, cost, and implementation strategy can be found in the following sections.

Table 11 Oxnard-Thousand Oaks-Ventura MSA CCAP Measures

Measure	GHG Emissions Reduction (MT CO₂e)		Near-Term (2030) Implementation Metrics
	2030	**2045**	
Cornerstone			
C-1: Expand the Ventura County Regional Energy Alliance's reach by evolving into an integrated Regional Climate Coalition with governance, funding, staffing, and community resources to support long-term implementation of climate action and resilience initiatives across the MSA.	Supportive		▪ Number of jurisdictions or agencies participating ▪ Amount of sustained funding secured ▪ Number of regional projects planned or implemented
Building Energy			
BE-1: Transition 71% of communitywide electricity to carbon-free energy sources by 2030 and 100% by 2045 and improve electrical system resilience through distributed energy resources and demand response programs.	250,365	0[58]	*Residential Buildings* ▪ 75% CPA 100% Green Power usage ▪ 8,524 kW of solar energy installed ▪ 1,218 household solar installations *Commercial Buildings* ▪ 65% CPA 100% Green Power usage ▪ 68,298 kW of solar energy installed
BE-2: Advance regional alignment of policies, incentives, and technical support so that 81% of residential buildings and 75% of nonresidential buildings are decarbonized by 2030 and remain at or above those levels through 2045.	20,675	51,893	▪ 81% all-electric new construction (residential) ▪ 75% all-electric new construction (commercial)
BE-3: Decarbonize and enhance the resilience of existing buildings to reduce natural gas use 8% by 2030 and 71% by 2045.	50,618	861,832	*Residential Buildings* ▪ 5,537,070 therms avoided (through water heater installments) ▪ 4,196,901 therms avoided (through HVAC installments) ▪ 44,362 electric water heaters installed ▪ 33,529 electric HVAC installed *Commercial Buildings* ▪ 1,508,498 therms avoided (through water heater installments)

---

[58] SB 100 requires the State's electricity sector to achieve 100 percent renewable and zero-carbon electricity by 2045. By that time, the electricity GHG emission factor will be 0 MT CO2e per kilowatt-hour, resulting in no additional reductions for Measure BE-1 beyond the State-mandated baseline.

Measure	GHG Emissions Reduction (MT CO$_2$e)		Near-Term (2030) Implementation Metrics
	2030	2045	
			▪ 3,329,470 therms avoided (through HVAC installments) ▪ 1,901 electric water heaters installed ▪ 754 electric HVAC installed
BE-4: Enhance grid performance and reliability through modern infrastructure upgrades.	Supportive		▪ Number of microgrids installed ▪ Number of electrical infrastructure upgrades completed/electrical infrastructure upgrades completed ▪ Number of pilot projects completed
Transportation and Mobility			
TM-1: Support a transportation sales tax measure to fund prioritized transportation infrastructure improvements and transit operations across the MSA.	Supportive		▪ Revenue generated from sales tax ▪ Number of projects funded through sales tax
TM-2: Implement priority projects identified in Ventura County's Active Transportation Plan (ATP),[59] Ventura County Transportation Commission's (VCTC) Comprehensive Transportation Plan (CTP),[60] Santa Paula Branch Line (SPBL) Master Plan,[61] and the Ventura County Regional Bicycle Wayfinding Plan[62] to increase active transportation mode share in the MSA from 11% to 13% by 2030 and 20% by 2045 and convert key roadway sectors into active transportation corridors.	14,776	68,813	▪ Number of priority projects implemented ▪ Miles of bike lanes built ▪ 13% active transportation mode share
TM-3: Implement priority projects identified in VCTC's Comprehensive Transportation Plan (CTP)[63] and Gold Coast Transit District's (GCTD) Building	31,248	91,434	▪ Number of priority projects implemented ▪ Number of annual public transit riders ▪ 3% public transit mode share

---

[59] County of Ventura. February 2024. Ventura County Active Transportation Plan. Accessed July 24, 2025, at: https://s47609.pcdn.co/wp-content/uploads/2024/03/Active-Transportation-Plan.pdf

[60] Ventura County Transportation Commission. February 2023. Ventura County Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/vc-county-comprehensive-transportation-plan/

[61] Ventura County Transportation Commission. VCTC Santa Paula Branch Line Trail Master Plan Update. Accessed July 24, 2025, at: https://www.goventura.org/spbl-trail-master-plan/

[62] Ventura County Transportation Commission. April 2017. Ventura County Regional Bikeway Wayfinding Plan. Accessed July 24, 2025, at: https://www.goventura.org/wp-content/uploads/2018/03/VCTC_Bicycle_Wayfinding__Plan_April_2017_FINAL.pdf

[63] Ventura County Transportation Commission. February 2023. Ventura County Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/vc-county-comprehensive-transportation-plan/

Measure	GHG Emissions Reduction (MT CO$_2$e)		Near-Term (2030) Implementation Metrics
	2030	2045	
Transit Supportive Communities (BTSC) Plan[64] to increase public transportation mode share in the MSA from 0.3% to 3% by 2030 and 10% by 2045.			

TM-4: Increase passenger zero-emission vehicle (ZEV) sales and adoption to 30% by 2030 and 100% by 2045 by expanding EV charging infrastructure across the MSA.	293,331	1,192,173	▪ 30% ZEV population
			▪ 5,082 public EV charging ports installed
			   o 313 DC Fast charging ports installed
			   o 4,769 Level 2 charging ports installed

TM-5: Increase commercial zero-emission vehicle (ZEV) sales and adoption to 20% by 2030 and 100% by 2045 by expanding the EV charging infrastructure across the MSA.	65,330	505,647	▪ 20% commercial ZEV population
TM-6: Electrify or otherwise decarbonize 60% of SORE[65] equipment and replace conventional diesel consumption with renewable diesel in 70% of applicable large diesel equipment by 2030 in alignment with EO N-79-20.	185,974	481,249	▪ 60% of SORE decarbonized ▪ 70% of diesel replaced with renewable diesel ▪ 6,634,717 gallons of off-road fuel avoided from SORE ▪ 16,276,358 gallons of conventional diesel replaced with renewable diesel
Waste Management			
SW-1: Expand and optimize source-separated collection systems to reduce contamination and improve diversion outcomes to reduce organic waste to landfill 75% by 2030 compared to 2014 levels (part of SB 1383 mandates) and to implement other mandated collection systems per AB 939 and AB 341.	281,544	369,059	▪ 516,477 tons of organic waste diverted annually ▪ 247,675 tons of organic waste composted annually ▪ 75% organics diversion rate
SW-2: Expand regional food recovery by sharing resources, improving transportation and storage systems, and enabling the rescue and distribution of edible food.	Supportive		▪ Tons of edible food or number of meals recovered

---

[64] Gold Coast Transit District. Building Transit Supportive Communities Plan. Accessed July 24, 2025, at: https://www.gctd.org/wp-content/uploads/2021/06/BTSC_PLAN_ENG_2020.pdf

[65] Small off-road engines as defined by CARB.
California Air Resources Board. SORE - Small Engine Fact Sheet. Accessed July 24, 2025, at: https://ww2.arb.ca.gov/resources/fact-sheets/sore-small-engine-fact-sheet

Measure	GHG Emissions Reduction (MT CO$_2$e)		Near-Term (2030) Implementation Metrics
	2030	2045	
Water and Wastewater			
WW-1: Advance regional One Water[66] strategies to reduce per capita potable water use by 15% by 2030, in line with California's Water Use Objective (WUO), while increasing the use and integration of alternative water sources (e.g., recycled water, stormwater, groundwater recharge) and renewable energy to build climate resilience and reduce GHG emissions.	2,728	0	▪ 19,906,176 kWh reduced from imported water ▪ 15% water use reduction compared to forecast
WW-2: Expand regional opportunities for implementation of wastewater decarbonization technologies to reduce GHG emissions, manage biosolids more sustainably, and generate renewable energy or fuels.	Supportive		▪ Quantity of GHG emissions reduced ▪ Number of new wastewater decarbonization technologies implemented
Natural and Working Lands			
NWL-1: Expand and maintain a healthy regional tree canopy and riparian buffers by planting 500 new trees annually through 2045 to boost carbon sequestration, enhance biodiversity, and strengthen resilience to heat and flooding.	266	3,717	▪ 2,500 trees planted ▪ Tree Equity Score
NWL-2: Expand and scale sustainable land management practices across rangelands, parks, and open spaces to enhance ecosystem health, improve soil and water resilience, reduce wildfire risk, and support biodiversity and long-term land productivity.	Supportive		▪ Acres of open space expansion ▪ Acres of conservation areas acquired
NWL-3: Meet SB 1383 procurement targets by annually procuring 39,394 tons of compost by 2030 and 39,811 by 2045.	15,622	15,787	▪ 39,394 tons of compost procured annually
NWL-4: Implement regional wildfire risk reduction strategies across public and private lands to protect carbon stocks, biodiversity, and community health.	Supportive		▪ Number of regional fuel-management projects completed ▪ Acres of wildfire hazard vegetation removal projects conducted
Agriculture			
AG-1: Accelerate adoption of climate-smart agriculture practices to improve soil health, reduce livestock (enteric fermentation) emissions 15% by 2030 and 35% by 2045, and reduce soil management (synthetic fertilizer) emissions 30% 2030 and 60% by 2045.	28,807	58,375	▪ 15% reduction in livestock methane emissions ▪ 30% reduction in synthetic fertilizer use

[66] One Water is an integrated, sustainable approach to water resource management that treats all water, drinking water, wastewater, stormwater, recycled water, and groundwater, as a single, interconnected resource. Rather than managing each source in isolation, One Water planning emphasizes coordination across sectors, maximizing reuse and conservation, and ensuring the right water quality is used for the right purpose. This approach enhances climate resilience, supports long-term water security, and prioritizes fair access for all communities. More information available at: https://uswateralliance.org/about-us/vision-for-a-one-water-future/

| | GHG Emissions Reduction (MT CO$_2$e) | | Near-Term (2030) |
Measure	2030	2045	Implementation Metrics
AG-2: Create an agricultural equipment decarbonization program to reduce agricultural fuel use by 30% by 2030 and 100% by 2045.	17,132	50,981	▪ 30% of agricultural equipment decarbonized ▪ 1,639,447 gallons of agricultural equipment fuel reduced
Notes: See Appendix C Measure Quantification Analysis Report for emissions quantification.			

4.1.1   Strategic Pillars

The actions supporting each measure were designed around a set of key pillars to support the MSA to reach its targets. The key pillars emphasize criteria that play an essential role in the development and implementation of each measure. The strategic pillars for each action are defined in Table 12, along with their code identifier used in the action lists in the following sections.

Table 12 Strategic Pillars Definitions

Pillar	Definition/Impact	Code
Feasibility	Actions that help local governments understand the costs, benefits, obstacles, and opportunities associated with programs, policies, and ordinances to make decisions that best serve the community.	F
Education	Actions to increase community awareness of programs available to reduce individual contributions to GHG emissions and increase resilience and establish or strengthen communication channels between local governments and the communities they serve.	Ed
Prioritization	Actions that engage priority populations in the decision-making process and establish policies and programs to provide priority populations with the resources to benefit from each measure's objectives in a prioritized manner.	Pr
Funding	Actions that provide the financial backing (e.g., grant funding, rebates, financial incentives) and adequate staffing to establish, implement, and maintain a program.	$
Partnerships	Actions that establish partnerships with external government entities, including tribes, community-based organizations, and utilities, to leverage their expertise, resources, and networks to implement programs and policies local governments would not be able to achieve alone.	P
Structural Change	Actions that change existing programs, policies, and ordinances to allow local governments and communities to reach the target established within a measure.	SC

4.1.2   Measure Summary Tables

Details on each measure as well as the actions that support them, are presented via summary tables associated with each measure. Measure summaries can be found in Sections 4.2 through 4.8. For each measure, the following information has been assessed:

- Estimate of the quantifiable GHG emissions reduction, if applicable
- Implementing agency or agencies
- Status of the authority to implement
- Geographic location
- Potential funding source or sources, if applicable
- Metrics for tracking progress
- Applicable U.S. EPA sector(s)
- Costs
- Implementation schedule
- Strategic pillars

Equations and methodologies utilized for quantification of measures, as well as substantial evidence for variables and assumptions can be found in Appendix C Measure Quantification Analysis Report. Costs for implementation are estimated by various methods that are described within each strategy or measure individually. The specific actions listed by measure serve as implementation milestones that guide the MSA to effectively work toward the goals outlined in this CCAP.

Implementation schedules for measures are broken out into phases. These are organized as follows and are indicated by action in the Actions tables:

- Phase 1: Actions to be taken in years 2026-2027
- Phase 2: Actions to be taken in years 2027-2030
- Phase 3: Actions to be taken in years 2030-2045

Metrics for progress tracking are quantified when applicable to a quantitative measure and qualitative when applicable to a supportive measure.

4.1.3   Funding Opportunities

Each measure was also reviewed for potential implementation funding opportunities which are described in more detail in Table 58 of Section 10. Table 13 provides a summary of the identified funding sources, along with a corresponding identifier used as a reference within each measure summary table.

In addition to funding, a high-level cost analysis was conducted for each measure to help the MSA understand general implementation cost categories ranging from low-cost initiatives like education and outreach to capital-intensive investments such as infrastructure upgrades or fleet electrification. While this analysis does not provide exact cost estimates, the analysis uses the best available data to estimate an approximate cost to highlight the relative scale and types of resources that may be needed, supporting both prioritization and funding decisions.

Importantly, this analysis does not attempt to quantify the cost of inaction, such as the long-term economic impacts of extreme heat, worsening air quality, or climate-related infrastructure damage—which are likely to far exceed the costs of proactive climate action. While these avoided costs are difficult to measure, the CCAP prioritizes strategies that not only reduce greenhouse gas emissions but also generate co-benefits like improved public health, operational savings, and enhanced community resilience. A "Cost Discussion" is included below each measure summary table to provide further context for the cost analysis.

Table 13 Funding Opportunities by ID

Opportunity ID	Opportunity Title	Organization
Building Energy		
1	Building Initiative for Low-Emissions Development Program (BUILD)	California Energy Commission (CEC)
2	Energy Conservation Assistance Act	CEC
3	GoGreen Multi-family Energy Financing	California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA)
4	GoGreen Business Energy Financing	CAEATFA
5	GoGreen Home Energy Financing	CAEATFA

Opportunity ID	Opportunity Title	Organization
6	Self-Generation Incentive Program (SGIP) / New Home Energy Storage Pilot (NHESP)	California Public Utilities Commission (CPUC)/ Southern California Edison (SCE)
7	Electric Program Investment Charge (EPIC) / Advanced Grid Technology Acceleration Projects	CEC
8	Round 2 Community Energy Reliability and Resilience Investment (CERRI) Program	CEC
Agriculture / Natural and Working Lands		
9	Urban and Community Forestry Grants	California Department of Forestry and Fire Protection (CAL FIRE)
10	California Forest Improvement Program (CFIP)	CAL FIRE
11	Wildfire Prevention Grants	CAL FIRE
12	Rural Energy for America Program (REAP)	Rural Department US Department of Agriculture
13	Climate Adaptation and Resiliency Program	California Wildlife Conservation Board
14	Healthy Soils Program	California Department of Food and Agriculture (CDFA)
15	Forest Health Grants	CAL FIRE
16	Environmental Quality Incentives Program (EQIP)	US Department of Agriculture
Waste Management / Wastewater / Water		
17	Integrated Regional Water Management (IRWM) Grant Programs	California Department of Water Resources (DWR)
18	Organics Grant Program	CalRecycle
Transportation		
19	California Electric Vehicle Infrastructure Project 2.0 (Fast Charge California Project)	CEC
20	Energy Infrastructure Incentives for Zero-Emission (EnergIIZE) Commercial Vehicles Project Transit Set-Aside	CEC
21	Sustainable Transportation Planning Grants	California Department of Transportation (CalTrans)
22	Depot Charging and Hydrogen Refueling Infrastructure for Zero-Emission Medium and Heavy-Duty on-road, off-road, and specialty vehicles	CEC
23	Active Transportation Program	Caltrans
24	Clean Air Fund	Ventura County Air Pollution Control District (APCD)
25	Carl Moyer Memorial Air Quality Standards Attainment Program	California Air Resources Board (CARB)/ Ventura County APCD

Opportunity ID	Opportunity Title	Organization
26	FARMER	CARB
27	126 Corridor EV Chargers	Ventura County APCD
28	Old Car Buyback	Ventura County APCD
29	Surface Transportation Block Grant	Southern California Association of Governments (SCAG)
30	Congestion Mitigation and Air Quality Improvement Program	SCAG

Sections 4.2 through 4.8 describe the suite of GHG reduction measures and actions identified to meet the reduction targets outlined in Section 3. These are organized by sector; where sector definitions differ from the CCAP guidelines, the Applicable U.S. EPA sector(s) is noted.

4.2   Cornerstone

Fundamentally, a cornerstone measure, like a cornerstone in construction, is crucial as it establishes the foundation and is often used as a reference point for aligning the rest of the structure. In a climate action plan, the cornerstone measure aligns with and supports the goals of the community, provides direction for the plan, and is intended to clearly illustrate the importance of pillars in supporting the implementation of a measure. The MSA's cornerstone measure was developed to embody the spirit and character of the region and emphasize the importance of collaboration. The goal of the cornerstone measure is to catalyze climate action, secure resources, and facilitate MSA-wide progress.

4.2.1   Ventura County Regional Energy Alliance

The Ventura County Regional Energy Alliance (VCREA) is an existing joint powers authority (JPA) focused on energy stewardship and sustainability practices throughout Ventura County, facilitating regional collaboration among local governments and other interested parties. With an established board of directors, VCREA also has a strong governance structure already in place and is positioned to pursue funding opportunities and develop collaborative, strategic resources for the County, local jurisdictions, and special districts within the MSA.

Despite the strong framework, VCREA is limited in scope, staffing, and funding, mainly functioning as a grant-driven energy alliance. To effectively drive implementation of the sector-specific measures and actions detailed in the CCAP, the MSA plans to build from VCREA's existing program and support the evolution into a more robust **Regional Climate Coalition** dedicated to collectively pursuing funding opportunities, securing broad MSA-wide support, developing County wide resources, and managing cross jurisdictional priority projects. Strengthening VCREA into a full-scale regional climate action coalition would expand it into a broader climate implementation hub, providing more accountability, coordination, and funding for projects across the MSA.

Measure C-1: Expand the Ventura County Regional Energy Alliance's reach by evolving into an integrated Regional Climate Coalition with governance, funding, staffing, and community resources to support long-term implementation of climate action and resilience initiatives across the MSA.

An explanation is provided to give an example of how the cornerstone measure aligns with each climate policy pillar discussed above, showcasing the value of integrating this framework into each of the measures.

- The Cornerstone Measure focuses on **Feasibility** by conducting a comprehensive study to evaluate the creation of a formal Climate Resilience District. This structure would facilitate shared governance, cross-sector investment, and streamlined access to state and federal funding—laying the groundwork for scalable and cost-effective implementation.
- **Prioritization** is embedded through the intentional inclusion of priority communities in the governance structure, steering actions to specifically reflect the demographics and needs of the most vulnerable populations. This alignment advances procedural priority and community ownership.
- **Structural Change** is addressed by expanding VCREA's mission and scope beyond energy, allowing for a more holistic approach to climate resilience across sectors such as building

energy, water, waste, carbon sequestration and transportation. Revising MOUs to reflect this integrated mission supports long-term institutional alignment and accountability.

- **Funding** for the measure would be provided by philanthropic partners and the private sector to launch priority-focused pilot projects, while the coalition structure supports ongoing pursuit of public grants and pooled local contributions to establish and maintain financial sustainability.

- **Education** is emphasized through a centralized knowledge-sharing platform, multi-lingual technical resources, and regional events—creating a transparent feedback loop between community members, technical staff, and leadership. These tools also help build public support and public engagement.

- **Partnerships** would be enhanced through collaboration with academic institutions, climate collaboratives, community-based organizations and regional networks like Central Coast Climate Collaborative (4C) to co-host an annual summit. This summit would serve as a space to share case studies, scale best practices, and build capacity for long-term climate leadership.

Measure Description

The following table summarizes the key descriptive information for the measure.

Table 14 Measure C-1 Summary

Expand the Ventura County Regional Energy Alliance's reach by evolving into an integrated Regional Climate Coalition with governance, funding, staffing, and community resources to support long-term implementation of climate action and resilience initiatives across the MSA.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	None currently identified
Metrics for Progress Tracking	- Completion of Climate Resilience District feasibility study - Development of expanded VCREA's goals, mission, and values - Number of entities participating - Amount of sustained funding secured - Number of projects planned - Number of projects implemented
Applicable EPA Sector(s)	All

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the development of a Regional Climate Coalition established by Measure C-1.

Action ID	Action Description	Phase	Pillars
C-1.1	Conduct a comprehensive feasibility study to evaluate the potential for expanding the MSA into a formal Climate Resilience District — a designated area where the region collaborates to implement climate action and adaptation strategies, invest in resilient infrastructure, and access shared funding and governance structures to protect the regional community.	1	F

Action ID	Action Description	Phase	Pillars
C-1.2	Work with VCREA to expand the governing board to include representatives from key interested parties, including municipalities, county agencies (e.g., RMA, AW&M, PWA), CBOs, educational institutions, special districts, and labor unions. Build in balanced representation as a part of the core governing board goals by having representation from priority communities equivalent to or greater than the percent of community members who live in priority communities in the total population.	1	Pr
C-1.3	Review and update VCREA's goals, mission, and values to expand the capacity of the scope beyond energy, enabling coordinated action across transportation, water, waste, and other community-serving sectors. This effort will strengthen VCREA's capacity to address interconnected sustainability challenges, leverage cross-sector funding opportunities, and better serve member agencies through a more integrated approach to resilience and resource management. Once the goals, mission, and values are revised, update existing memorandums of understanding (MOU) to integrate VCREA's revised goals, mission, and values.	1	SC
C-1.4	Identify and partner with philanthropic organizations and private sector entities to fund pilot projects in the MSA with a focus on priority areas to showcase the benefits of regional collaboration on the community.	2	$
C-1.5	Strengthen regional collaboration by creating a centralized knowledge-sharing platform (e.g., online dashboard) where coalition members can access and contribute case studies, funding opportunities, policy/ordinance templates, and technical guidance. As part of this process, provide information for City staff to work directly with city councils and county leadership to build political will, foster shared accountability, and integrate climate action into core municipal decision-making. To celebrate progress, host an annual award dinner/banquet that recognizes innovation, collaboration, and meaningful change. Additionally, increase public transparency by hosting bi-annual town halls to update community members on climate actions, funding, and project status.	2	Ed
C-1.6	Explore partnerships with academic institutions such as the University of California, Santa Barbara (UCSB), Ventura County Community College District (VCCCD), and California State University Channel Islands (CSUCI), or other organizations such as the Central Coast Climate Collaborative (4C) to develop or participate in an existing annual Regional Climate Summit bringing together community-based organizations, academic institutions, industry leaders, and local jurisdictions to exchange successes, challenges, and lessons learned from initiatives such as building electrification, adoption of reach codes, and green infrastructure development, while fostering cross-sector collaboration and capacity-building.	1-2	P

4.3　Building Energy

Building energy accounts for nearly a third (32 percent) of the MSA's total community GHG emissions. Within this sector, natural gas and electricity contribute 19 percent and 13 percent, respectively. Given its significant share, the building energy sector offers a significant opportunity for impactful GHG reduction strategies.

California has made significant progress toward decarbonizing its electricity sector through Senate Bill (SB) 100, which accelerates the Renewable Portfolio Standard (RPS). This legislation requires utilities to source 50 percent of their electricity from renewables by 2026, 60 percent by 2030, and 100 percent by 2045. SB 1020, adopted in 2022, builds on these goals by mandating that 90 percent of electricity come from renewable or zero-carbon sources by 2035, and 95 percent by 2040. Measure BE-1 supports this transition by facilitating the shift to renewable energy sources for communitywide electricity, while Measure BE-4 strengthens grid performance and reliability through targeted infrastructure upgrades.

While the electricity grid is on a path to becoming carbon-free by 2045, emissions from natural gas use are projected to remain steady. To support statewide decarbonization efforts, Measures BE-2 and BE-3 prioritize accessible electrification across new and existing buildings, with a focus on regional coordination and support for priority communities. Measure BE-2 aims to align building policies, codes, and technical resources across the region to encourage that all new construction be zero-emission and climate-resilient. Measure BE-3 focuses on retrofitting existing buildings by establishing a regional model retrofit code, identifying financing solutions, and expanding education, outreach, and workforce training programs. Both measures are designed to promote accessible, cost-effective, and scalable electrification efforts—particularly for communities most vulnerable to climate change. Although upfront costs can pose a challenge, electrification offers significant long-term benefits and cost savings.

Measure BE-1: Transition 71% of communitywide electricity to carbon-free energy sources by 2030 and 100% by 2045 and improve electrical system resilience through distributed energy resources and demand response programs.

Measure Description

This measure supports the transition to carbon-free electricity by expanding participation in the CPA 100% Green Power rate, increasing deployment of distributed solar and battery storage, and investing in grid resilience. Shifting to clean electricity is critical to meeting climate targets, supporting building and vehicle electrification, and preparing for power disruptions. Emphasis will be placed on fair access to clean energy solutions, especially for renters, low-income households, and residents of mobile home parks or grid-constrained areas.

Implementation actions include targeted outreach and education campaigns to boost enrollment in CPA's 100% Green Power rate and connect residents with services and rebates from 3C-REN, VCREA, and CPA. The MSA will develop a model permitting process to streamline solar and battery permitting across jurisdictions, identify sites for utility-scale energy projects, and pursue funding for community solar and storage in underserved areas. Financial incentives for solar adoption and demand response participation will be explored in coordination with CPA and SCE.

To improve long-term resilience and economic opportunity, the MSA will work with CPA to expand the existing SmartCharge program and align electricity rates with renewable generation peaks, as well as collaboratively investing in workforce training for clean energy careers. Progress will be tracked by enrollment in clean energy programs, solar and battery installations, and participation in demand response and EV charging programs.

The following table summarizes the key descriptive information for the measure.

Table 15 Measure BE-1 Summary

Transition 71% of communitywide electricity to carbon-free energy sources by 2030 and 100% by 2045 and improve electrical system resilience through distributed energy resources and demand response programs.	
GHG Emissions Reduction (2030)	250,365 MT CO$_2$e
GHG Emissions Reduction (2045)	0 MT CO$_2$e[1]
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	2,7
Metrics for Progress Tracking	*Residential Buildings* **2030 Metrics** ▪ 75% CPA 100% Green Power usage ▪ 8,524 kW of solar energy installed ▪ 1,218 household solar installations **2045 Metrics** ▪ 95% CPA 100% Green Power usage ▪ 14,238 kW of solar energy installed ▪ 2,034 household solar installations *Nonresidential Buildings* **2030 Metrics** ▪ 65% CPA 100% Green Power usage ▪ 68,298 kW of solar energy installed **2045 Metrics** ▪ 90% CPA 100% Green Power usage ▪ 74,445 kW of solar energy installed
Applicable EPA Sector(s)	Electricity Consumption

Notes

1. SB 100 requires the State's electricity sector to achieve 100 percent renewable and zero-carbon electricity by 2045. By that time, the electricity GHG emission factor will be 0 MT CO$_2$e per kilowatt-hour, resulting in no additional reductions for Measure BE-1 beyond the State-mandated baseline.

Cost Discussion

Achieving the emissions reduction for Measure BE-1 will require residents and businesses switching to CPA's 100% Green Power rate and installing distributed solar and battery storage in residential and nonresidential buildings. Costs were determined separately for these efforts.

CLEAN POWER ALLIANCE 100% GREEN POWER

Switching to CPA's 100% Green Power rate will require residents and businesses to cover the cost difference between this new rate and the original rate they were enrolled in—whether that be

CPA's Lean Power rate, CPA's Clean Power rate, or SCE's rates. Currently, CPA's 100% Green Power rate is more expensive per kilowatt-hour than the other three rate options in the MSA. While the costs of these rates will change over the coming years, 2025 rate costs have been used as a proxy to estimate costs through 2045. Table 16 shows the methodology used to estimate the average baseline unit cost of electricity in the MSA. The table applies the share of electricity usage associated with the three non-CPA 100% Green Power rates in the inventory to the 2025 cost rates to estimate a weighted average residential and nonresidential baseline unit cost. Table 17 compares this baseline unit cost to CPA 100% Green Power's current unit cost and applies the resulting incremental unit cost to the total electricity consumption to estimate total residential and nonresidential costs by 2030 and 2045. The analysis assumes a linear ramp-up in CPA's 100% Green Power rate to the implementation targets in 2030 and 2045.

Since all rate options will utilize 100 percent renewable energy in 2045, like the CPA 100% Green Power rate, it is likely that the incremental cost difference will decrease around 2045. Thus, the long-term costs are likely lower than estimated here. Additionally, income-qualified customers on the Family Electric Rate Assistance (FERA), California Alternate Rates for Energy (CARE), and Medical Baseline Allowance Programs as well as jurisdictions using CPA's 100% Green Power rate as the default see electric bill discounts. These discounts may result in lower incremental costs differences between current rate choices and CPA's 100% Green Power rate but were excluded from the cost estimate to remain conservative.

Table 16 Measure BE-1 CPA 100% Green Power Baseline Unit Cost Inputs

Rate	2025 Unit Costs ($/kWh)[1]	Share of Non-CPA 100% Green Power Electricity Usage[2]	Weighted Average Non-CPA 100% Green Power Unit Cost ($/kWh)
Residential			
CPA Lean Power	$0.3400	49%	$0.3436
CPA Clean Power	$0.3469	9%	
SCE	$0.3469	43%	
Nonresidential			
CPA Lean Power	$0.2790	30%	$0.2830
CPA Clean Power	$0.2847	4%	
SCE	$0.2847	66%	

Notes: kWh = kilowatt-hour; CPA = Clean Power Alliance; SCE = Southern California Edison.

1. Southern California Edison. SCE and CPA Joint Rate Comparisons. Accessed July 24, 2025, at: https://www.sce.com/customer-service-center/community-choice-aggregation/sce-cpa-joint-rate-comparisons.

2. Calculated from the 2022 GHG Inventory for the MSA. See Appendix A Greenhouse Gas Inventory Analysis Report for more details.

Table 17 Measure BE-1 CPA 100% Green Power Cost Summary

Variable	Units	2030	2045
Residential			
Cumulative Electricity Consumption[1]	kWh	12,694,615,111	65,743,798,553
CPA 100% Green Power Opt-In Above Baseline	Percentage	28%	48%
Implementation Years	Years	5	15
Cumulative CPA 100% Green Power Electricity Consumption Above Baseline[2]	kWh	2,159,370,094	25,845,193,884

Variable	Units	2030	2045
Weighted Average Non-CPA 100% Green Power Unit Cost[3]	Dollars/kWh	$0.3436	$0.3436
CPA 100% Green Power Unit Cost[4]	Dollars/kWh	$0.3677	$0.3677
Incremental Unit Cost	Dollars/kWh	$0.0242	$0.0242
Cost per Household[5]	Dollars/household	$212.03	$469.13
Total Cost	**Dollars**	**$52,213,899**	**$624,940,740**
Nonresidential			
Cumulative Electricity Consumption[1]	kWh	17,277,333,140	63,452,513,086
CPA 100% Green Power Opt-In Above Baseline	Percentage	30%	55%
Implementation Years	Years	5	15
Cumulative CPA 100% Green Power Electricity Consumption Above Baseline[2]	kWh	3,132,892,374	27,913,918,001
Weighted Average Non-CPA 100% Green Power Unit Cost[3]	Dollars/kWh	$0.2830	$0.2830
CPA 100% Green Power Unit Cost[4]	Dollars/kWh	$0.3018	$0.3018
Incremental Unit Cost	Dollars/kWh	$0.0188	$0.0188
Total Cost	**Dollars**	**$58,851,681**	**$524,365,601**

Notes: kWh = kilowatt-hour; CPA = Clean Power Alliance; SCE = Southern California Edison.

1. Represents aggregated kWh of electricity consumed by the MSA during the implementation years.

2. Represents the cumulative electricity consumption from CPA 100% Green Power above the baseline. This is estimated by multiplying the linear interpolation of cumulative electricity consumption with the interpolated opt-in rates over the designated implementation years to meet the 2030 and 2045 targets (i.e., CPA 100% Green Power Opt-In Above Baseline). This methodology accounts for the gradual ramp-up of program participation over time.

3. See Table 16.

4. Southern California Edison. SCE and CPA Joint Rate Comparisons. Accessed July 24, 2025, at: https://www.sce.com/customer-service-center/community-choice-aggregation/sce-cpa-joint-rate-comparisons.

5. The cost per household is calculated by summing the forecasted residential electricity use, passenger EV electricity consumption, and building electrification demand, then dividing by the total number of forecasted households and multiplying by the incremental unit cost. It's important to note that future electrification trends may affect these costs.

SOLAR INSTALLATIONS

The primary costs associated with increasing distributed renewable energy generation in the MSA include the cost of installing solar panels on residential and non-residential buildings. Table 18 details the methodology used to estimate the kilowatt capacity of solar energy needed to be installed in the MSA at buildings that opt-out of CPA's 100% Green Power rate. This methodology leverages the expected annual kilowatt-hour production of a one-kilowatt solar system in the MSA based on the National Renewable Energy Laboratory's PVWatts Calculator.[67] Applying representative unit cost for solar residential and non-residential installations to the needed kW capacity provides total costs for the measure. According to Forbes' research, it costs on average $3 per watt (or $3,000 per kilowatt) to install solar energy on residential buildings in California.[68] Similarly, according to the Solar Energy Industries Association, it costs about $2 per watt (or $2,000

---

[67] National Renewable Energy Laboratory. PV Watts Calculator for a 1-kW System in Ventura, CA. Accessed July 24, 2025, at: https://pvwatts.nrel.gov/pvwatts.php

[68] Forbes. August 5, 2024. Solar Panel Costs California: Are Solar Panels Worth It? Accessed July 24, 2025, at: https://www.forbes.com/home-improvement/solar/solar-panel-costs-california/

per kilowatt) to install solar energy on non-residential buildings in the U.S.[69] These costs represent the upfront installation costs before incentives. Applying these unit costs to the capacity of solar energy needed yields the total residential and nonresidential cost estimates presented in Table 18.

Assuming an average residential solar system size of seven kW,[70] this equates to roughly 2,034 residential buildings receiving new solar installations by 2045, at an estimated cost of $21,000 per household. However, many households may choose to finance their solar systems, and a substantial number are likely to see long-term savings on electricity bills. As a result, the true lifecycle cost for both residential and non-residential installations is expected to be significantly lower than the upfront cost alone suggests.

Table 18 Measure BE-1 Solar Installations Cost Summary

Variable	Units	2030	2045
Residential			
Non-100% Green Power Total Electricity Consumption	kWh	693,391,068	289,555,304
Solar Energy Share Target	Percentage	2%	8%
Total Solar Electricity Consumption Needed	kWh	13,867,821	5,791,106
Electricity Generation per kW Solar[1]	kWh/kW	1,627	1,627
Solar Capacity Needed	kW	8,524	14,238
Unit Cost[2]	Dollars/kW	$3,000	$3,000
Cost per Household[3]	Dollars/household	$21,000	$21,000
Total Cost	**Dollars**	**$25,570,660**	**$17,141,862[5]**
Nonresidential			
Non-100% Green Power Total Electricity Consumption	kWh	1,234,674,723	484,487,733
Solar Energy Share Target	Percentage	9%	25%
Total Solar Electricity Consumption Needed	kWh	111,120,725	43,603,896
Electricity Generation per kW Solar[1]	kWh/kW	1,627	1,627
Solar Capacity Needed	kW	68,298	74,445
Unit Cost[4]	Dollars/kW	$2,000	$2,000
Total Cost	**Dollars**	**$136,595,851**	**$12,294,048[5]**

Notes: kWh = kilowatt-hour; kW = kilowatt.

1. National Renewable Energy Laboratory. PV Watts Calculator for a 1-kW System in Ventura, CA. Accessed July 24, 2025, at: https://pvwatts.nrel.gov/pvwatts.php

2. Forbes. Solar Panel Costs California: Are Solar Panels Worth It? Accessed July 24, 2025, at: https://www.forbes.com/home-improvement/solar/solar-panel-costs-california/

3. This cost per household should be considered a general estimate, as future electrification trends may influence overall costs.

[69] Solar Energy Industries Association. Solar Industry Research Data. Accessed July 24, 2025, at: https://seia.org/research-resources/solar-industry-research-data/

[70] U.S. Department of Energy. Homeowner's Guide to Going Solar. Accessed July 24, 2025, at: https://www.energy.gov/eere/solar/homeowners-guide-going-solar

Variable	Units	2030	2045

4. Solar Energy Industries Association. Solar Industry Research Data. Accessed July 24, 2025, at: https://seia.org/research-resources/solar-industry-research-data/

5. 2030 total costs are subtracted from 2045 total costs to show the additional total costs needed by 2045.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the communitywide carbon-free electricity targets established by Measure BE-1.

Action ID	Action Description	Phase	Pillars
BE-1.1	Provide information on available rebates and services from agencies like 3C-REN, Ventura County Regional Energy Alliance (VCREA), and SCE and CPA through bill inserts, social media, city newsletters, and community events.	1	Ed
BE-1.2	Develop a model permitting process for on-site solar and battery storage systems that can be replicated throughout the MSA to streamline approvals, reduce costs, and accelerate deployment across all jurisdictions. This initiative will bring together City and County permitting departments, utilities, and industry experts to create a unified permitting framework, aligning requirements, timelines, and review processes.	1-2	SC
BE-1.3	Coordinate with the County to identify strategic sites for deployment of utility-scale solar and battery storage projects, prioritizing underutilized public land and grid-constrained areas in alignment with the County's COS-U: Solar canopies in non-residential projects program and COS-Q: Incentives for development of renewable energy projects program. Focus on projects that enhance local grid reliability and create community co-benefits such as workforce development or public facility backup power.	1	F
BE-1.4	Collaborate with CPA, SCE, local governments, and community-based organizations to develop and deploy community solar projects that expand fair access to local, carbon-free electricity — particularly for renters, low-income households, and those without suitable rooftops. Emphasize co-benefits like localized bill savings, job creation, grid resilience through paired storage, and opportunities for community ownership or participation. Prioritize projects in priority areas, such as mobile home parks, and integrate with clean energy outreach efforts to maximize support.	2	SC
BE-1.5	Partner with CPA and SCE to explore incentives, rebates, or credits for households and businesses participating in demand response programs or adopting on-site solar energy technologies, as applicable. Conduct a feasibility study to evaluate the financial and technical implications of such programs, confirming they are equally accessible to priority communities.	1-2	P, F, Pr
BE-1.6	Partner with SCE and CPA to explore possible ways to expand their respective EV Charging programs by enhancing time-of-use (TOU) electricity rates that further incentivize off-peak and daytime EV charging. Tailor rate structures to better align with solar generation peaks and grid capacity, while improving affordability and accessibility for EV users, especially in priority communities. Support targeted outreach to increase program participation and accessibility across the MSA.	2	P, Ed, Pr
BE-1.7	Collaborate with unions, community colleges (e.g., the Ventura County Community College District [VCCCD]), and job training programs to educate both residents and contractors on the growing demand for electrification and energy efficiency services, confirming that the workforce is prepared to meet regional goals.	1-2	Ed
BE-1.8	Secure funding for an MSA-wide community education and outreach program focused on clean energy, energy resilience, and widespread participation by leveraging a combination of state and federal grants, utility partnerships, and local government contributions. Explore opportunities through programs like the	1-2	$

Action ID	Action Description	Phase	Pillars
	California Public Utilities Commission (CPUC) Equity Resiliency Budget and California Energy Commission (CEC) grants for community-based clean energy initiatives.		
BE-1.9	Work with the CPA and SCE to explore financial assistance or alternative rate structures to increase participation in their respective 100% renewable products, while minimizing cost burdens to priority communities.	2	$

Measure BE-2: Advance regional alignment of policies, incentives, and technical support so that 81% of residential buildings and 75% of nonresidential buildings are decarbonized by 2030 and remain at or above those levels through 2045.

Measure Description

Decarbonizing new construction is essential to achieving long-term climate goals, as buildings constructed today will remain in use for decades. This measure focuses on regional coordination to require all-electric, climate-resilient new buildings across the MSA. A regional task force of local governments, utilities, builders, labor unions, and Tribes will be convened to align building code updates, share best practices, and coordinate developer outreach. A model "reach" code mandating all-electric construction for non-commercial developments with integrated resilience features—such as passive cooling, cool roofs, and backup power readiness—will be developed to streamline adoption and provide consistency across jurisdictions.

Supporting actions include pilot programs offering incentives and expedited permitting for resilient zero-emission homes, including a showcase all-electric affordable housing project. Outreach efforts will target developers, contractors, and the public with multilingual education on the health, safety, and economic benefits of electrification. Local governments will collaborate to provide technical assistance and secure funding from state, utility, and local sources to support adoption, especially in priority communities. Progress will be measured by code adoption, pilot program participation, and number of new buildings meeting zero-emission and resilience standards.

The following table summarizes the key descriptive information for the measure.

Table 19 Measure BE-2 Summary

Advance regional alignment of policies, incentives, and technical support so that 81% of residential buildings and 75% of nonresidential buildings are decarbonized by 2030 and remain at or above those levels through 2045.	
GHG Emissions Reduction (2030)	20,675 MT CO_2e
GHG Emissions Reduction (2045)	51,893 MT CO_2e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	1,6
Metrics for Progress Tracking	**2030 Metrics** ▪ 81% all-electric new construction (residential) ▪ 75% all-electric new construction (commercial) **2045 Metrics** ▪ 81% all-electric new construction (residential) ▪ 75% all-electric new construction (commercial)
Applicable EPA Sector(s)	Electricity Consumption; Stationary Sources

Cost Discussion

Achieving the emissions reduction for this measure requires electrifying new residential and commercial buildings by leveraging existing statewide analyses and case studies on the construction costs, operational savings, and grid impacts of all-electric buildings compared to mixed-fuel alternatives to provide information that encourages all-electric construction. Additionally, the MSA

would work with developers, contractors, realtors, health care providers, and the community to first identify barriers to implementation and then develop a coordinated outreach program outlining the public health benefits, upfront cost savings, and long-term cost savings of all-electric construction. It is anticipated that these actions will support an industry wide transition towards all-electric new construction that is already underway. When combined, these actions will result in 81 percent of residential and 75 percent of commercial buildings being constructed without natural gas hookups by 2026, in alignment with statewide trends.[71] This aligns with findings from an April 2025 CEC report, which noted that 81 percent of residential and 75 percent of commercial building line extension requests to PG&E and SDG&E were for all-electric service.[72]

To estimate the costs associated with all-electric new construction for residential buildings, the number of new, all-electric residential households was estimated based on the current per household natural gas usage (354 therms per household), the forecasted residential natural gas use, and the estimated natural gas savings derived from an 81 percent new building electrification rate. As shown in Table 20, 8,058 new households would be constructed as all-electric (with the remaining built with mixed fuel) by 2030. Single family residential buildings are approximately $7,500 per household less expensive to construct compared to mixed fuel. Rather than generate a cost, building all-electric will save the community money.[73] Based on the number of projected households, building all electric could save up to $60,437,399 by 2030 and an additional $79,076,970 by 2045.

To estimate commercial electrification costs, the number of new, all-electric commercial buildings was estimated based on the estimated per square foot gas usage (0.26 therms per square foot), the forecasted nonresidential natural gas use, and the estimated natural gas savings derived from a 75 percent new building electrification rate. Estimated square footage was used since a total commercial building count for the MSA was not available. This estimate was derived from the 2022 California Commercial End-Use Survey (CEUS) Final Report.[74] As shown in Table 20, about 3,463,627 new square feet of commercial space would be constructed as all-electric (with the remaining built with mixed fuel) by 2030. According to the California Energy Commission, commercial buildings cost approximately $0.33 more per square foot to construct compared to standard mixed-fuel buildings.[75] The total costs for electrifying new commercial construction, estimated by multiplying the square feet of new construction by the unit cost, are $1,142,997 by 2030 and an additional $190,500 by 2045. It should be noted that these costs are based on 2022 data and the previous 2022 Building Efficiency Standards (Title 24). With the updated 2025 Building Efficiency Standards (Title 24), new all-electric construction will likely be less expensive than mixed fuel, making the cost estimate provided here conservative.[76]

---

[71] California Energy Commission. CEC's Electrification Summit Builds Clean Energy Partnerships Among Policy Leaders, Manufacturers, and Utilities. Accessed July 25, 2025, at: https://www.calenergyblog.com/post/cec-s-electrification-summit-builds-clean-energy-partnerships-among-policy-leaders-manufacturers-a.

[72] Ibid.

[73] New Buildings Institute. April 14, 2022. New Study on Electrification Costs Shows Benefits to Building Owners and Society. Accessed July 11, 2025, at: https://newbuildings.org/new-study-on-electrification-costs-shows-benefits-to-building-owners-and-society/

[74] California Energy Commission (CEC). February 2024. 2022 California Commercial End-Use Survey (CEUS): Final Report. Accessed July 11, 2025, at: https://www.energy.ca.gov/sites/default/files/2024-02/2022%20CEUS%20Final%20Report_ada.pdf

[75] Ibid.

[76] CEC. 2025 Building Energy Efficiency Standards. Accessed July 11, 2025, at: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency

Table 20 Measure BE-2 Cost Summary

	Units	2030	2045
Residential			
Natural Gas Usage Avoided	Therms	2,856,017	6,592,863
Natural Gas Usage per Household[1]	Therms/household	354	354
New Houses Electrified	Households	8,058	18,602
Cost per Household	Dollars/household	($7,500)	($7,500)
Total Costs	**Dollars**	**($60,437,399)**	**($79,076,970)[2]**
Commercial			
Natural Gas Usage Avoided	Therms avoided	885,441	1,033,015
Natural Gas Usage per Square Foot[3]	Therms/sq ft	0.26	0.26
New Floor Stock Electrified	Sq ft electrified	3,463,627	4,040,899
Cost per Square Foot	Dollars/sq ft	$0.33	$0.33
Total Costs	**Dollars**	**$1,142,997**	**$190,500[2]**

Notes: sq ft = square foot; () indicate negative values or cost savings.

1. Calculated using residential natural gas usage and number of households from 2022 GHG Inventory for the MSA. See Appendix A Greenhouse Gas Inventory Analysis Report for more details.

2. 2030 total costs are subtracted from 2045 total costs to show the additional total costs needed by 2045.

3. Calculated based on the total commercial floor stock in SCE territory and the total annual commercial natural gas usage in SCE territory in 2022.

   California Energy Commission (CEC). February 2024. 2022 California Commercial End-Use Survey (CEUS): Final Report. Accessed July 11, 2025, at: https://www.energy.ca.gov/sites/default/files/2024-02/2022%20CEUS%20Final%20Report_ada.pdf.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the new building decarbonization targets established by Measure BE-2.

Action ID	Action Description	Phase	Pillars
BE-2.1	Leverage existing statewide analyses and case studies on construction costs, operational savings, and grid impacts of all-electric buildings versus mixed-fuel alternatives. Share findings from jurisdictions with established electrification policies, highlight opportunities for cost reductions through bulk equipment procurement, and identify common financial or regulatory barriers to support informed decision-making among local partners.	1-2	Ed
BE-2.2	Develop a coordinated outreach program targeting developers, contractors, realtors, health care providers, and the public to communicate the health benefits, upfront cost savings, and long-term cost savings of all-electric construction. Host workshops, create multilingual materials, and collaborate with professional associations to integrate training into continuing education programs.	1-2	Ed
BE-2.3	Collaborate with local jurisdictions and utilities to establish a pilot program offering financial incentives and streamlined permitting for new zero-emission homes that meet enhanced climate resilience standards, prioritizing projects in priority areas vulnerable to wildfire, heat, and flooding risks.	1	F
BE-2.4	Partner with affordable housing developers and funders to launch a pilot all-electric, climate-resilient affordable housing development that integrates rooftop solar, battery storage, high-performance building envelopes, passive cooling strategies, and fire- and flood-resistant design. Measure and document energy savings, GHG reductions, and resilience performance (e.g., backup power uptime	1-2	SC, Ed

Action ID	Action Description	Phase	Pillars
	during outages), then share results through case studies, site tours, and developer workshops to accelerate adoption countywide.		
BE-2.5	Prioritize technical assistance, fee reductions, and permitting support for affordable housing developers and property owners in priority communities to ensure equal access to resilient, zero-emission building strategies.	1-3	Pr
BE-2.6	Secure and coordinate diversified funding sources—including state grants, utility incentives, and local government contributions—to support the development, deployment, and scaling of all-electric, resilient affordable housing projects. Establish a dedicated funding pool or grant program that prioritizes projects demonstrating innovative climate resilience features and measurable energy and emissions reductions, providing sustained financial support for pilot initiatives and broader replication across the region.	1-3	$

Measure BE-3: Decarbonize and enhance the resilience of existing buildings to reduce natural gas use 8% by 2030 and 71% by 2045.

Measure Description

This measure focuses on transitioning existing buildings away from natural gas by advancing electrification, improving energy efficiency, and strengthening climate resilience. Because retrofitting existing homes and commercial buildings can be costly and complex, the MSA will lead a regional study to evaluate financing strategies—such as on-bill financing and low-interest loans—that make upgrades more accessible. Results will inform the development of targeted incentive programs in partnership with 3C-REN and the CPA, with a focus on supporting low-income households and priority communities.

A model retrofit code will be developed to guide building upgrades that prioritize electrification, energy efficiency, and climate readiness features like solar-ready roofs and backup power systems. The MSA will also collaborate with 3C-REN to deliver community-specific outreach and education using trusted messengers, multilingual resources, and targeted programs like energy audits, workforce training, and contractor support. A pilot project will demonstrate full electrification and resilience upgrades at a multi-family housing complex, helping to identify scalable solutions.

To accelerate market readiness, the MSA will coordinate with local contractors, trade associations, and workforce programs to grow a skilled labor pool capable of delivering building retrofits at scale. These efforts will help make building decarbonization more achievable across all building types and neighborhoods.

The following table summarizes the key descriptive information for the measure.

Table 21 Measure BE-3 Summary

Decarbonize and enhance the resilience of existing buildings to reduce natural gas use 8% by 2030 and 71% by 2045.	
GHG Emissions Reduction (2030)	50,618 MT CO$_2$e
GHG Emissions Reduction (2045)	861,832 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	3,4,5
Metrics for Progress Tracking	*Residential Buildings* **2030 Metrics** ▪ 5,537,070 therms avoided (through water heater installments) ▪ 4,196,901 therms avoided (through HVAC installments) ▪ 44,362 electric water heaters installed ▪ 33,529 electric HVAC installed **2045 Metrics** ▪ 45,363,255 therms avoided (through water heater installments) ▪ 40,202,510 therms avoided (through HVAC installments) ▪ 363,441 electric water heaters installed ▪ 321,180 electric HVAC installed *Commercial Buildings* **2030 Metrics** ▪ 1,508,498 therms avoided (through water heater installments) ▪ 3,329,470 therms avoided (through HVAC installments) ▪ 1,901 electric water heaters installed ▪ 754 electric HVAC installed **2045 Metrics** ▪ 9,434,292 therms avoided (through water heater installments) ▪ 31,650,696 therms avoided (through HVAC installments) ▪ 11,890 electric water heaters installed ▪ 7,169 electric HVAC installed
Applicable EPA Sector(s)	Electricity Consumption; Stationary Sources

Cost Discussion

Reducing natural gas consumption to the levels noted in Table 21 will be achieved through the replacement of natural gas appliances with heat pump water heaters and heat pump heating, ventilation, and air conditioning (HVAC) systems at the end of each appliance's useful life in both residential and commercial buildings. Because these replacements are assumed to occur at the time of natural equipment turnover, only the incremental cost, which is the difference in cost between a standard gas appliance and its heat pump equivalent, is considered.

For residential buildings, the incremental cost of installing a heat pump water heater is estimated at $1,840,[77] while the cost difference for a heat pump HVAC system is approximately $14,061.[78,79] These values, when multiplied by the number of residential appliance replacements required to achieve the target in Table 21, result in the total residential cost estimates summarized in Table 22. These estimates do not account for available rebates or external incentives, and therefore represent conservative, high-end costs. While upfront costs may be a barrier for some households, many residents may experience long-term utility bill savings that partially offset installation costs over time.

Table 22 Measure BE-3 Residential Cost Summary

Variable	Units	2030		2045	
		Water Heaters	HVAC Units	Water Heaters	HVAC Units
Natural Gas Usage Avoided	Therms	5,537,070	4,196,901	45,363,255	40,202,510
Average Natural Gas Usage per Appliance[1]	kWh/appliance	3,657	3,668	3,657	3,668
Electricity to Therms Conversion Factor[2]	kWh/therms	29.3	29.3	29.3	29.3
Electric Appliances Installed	Appliances	44,362	33,529	363,441	321,180
Incremental Cost per Appliance[3]	Dollars/appliance	$1,840	$14,061	$1,840	$14,061
Total Costs	**Dollars**	**$81,625,720**	**$471,455,074**	**$587,104,881[4]**	**$4,044,657,127[4]**

Notes: HVAC = heating, ventilation, and air conditioning; kWh = kilowatt-hour.

1. Calculated from ResStock outputs for Ventura County. Accessed July 24, 2025, at: https://data.openei.org/s3_viewer?bucket=oedi-data-lake&prefix=nrel-pds-building-stock%2Fend-use-load-profiles-for-us-building-stock%2F2024%2Fresstock_tmy3_release_2%2Fmetadata_and_annual_results%2Fby_state%2Fstate%3DCA%2Fcsv%2F.
2. Metric Conversions. Therms (US) to Kilowatt-hours. Accessed July 24, 2025, at: https://www.metric-conversions.org/energy-and-power/therms-us-to-kilowatt-hours.htm.
3. Bay Area Air Quality Management District (BAAQMD). 2024. Installation Costs for Zero-NOx Space and Water Heating Appliances. Accessed on July 22, 2025, at: https://www.baaqmd.gov/~/media/files/community-health/building-appliance-implementation/task1_electrificationcosts-pdf.pdf
4. 2030 total costs are subtracted from 2045 total costs to show the additional total costs needed by 2045.

For commercial buildings, data on the cost difference between gas and electric water heaters is limited and highly variable, as costs are often specific to individual building characteristics. As a result, it is not feasible to estimate commercial water heater costs at this time.

---

[77] Bay Area Air Quality Management District (BAAQMD). 2024. Installation Costs for Zero-NOx Space and Water Heating Appliances. Accessed on July 22, 2025, at: https://www.baaqmd.gov/~/media/files/community-health/building-appliance-implementation/task1_electrificationcosts-pdf.pdf

[78] Ibid.

[79] Due to limited availability of regional cost data, incremental costs for installing heat pump appliances were sourced from Bay Area data, as the information provided by BAAQMD represents the most recent and detailed dataset currently available.

While cost data for commercial gas and electric HVAC systems is also limited, information is available for rooftop packaged units, which are common in commercial settings. This data serves as a reasonable proxy for estimating HVAC conversion costs. The average incremental cost of replacing a gas rooftop unit with an electric equivalent, including installation, is approximately $1,033.[80] When multiplied by the number of commercial HVAC replacements required to meet the target identified in Table 21, this yields the total estimated costs summarized in Table 23.

These estimates do not account for available incentives or rebates and therefore represent conservative, high-end costs. As with residential buildings, the costs presented here may pose a significant barrier to adoption without additional financial support or incentive programs.

Table 23 Measure BE-3 Commercial Cost Summary

Variable	Units	2030		2045	
		Water Heaters	HVAC Units	Water Heaters	HVAC Units
Natural Gas Usage Avoided	Therms	1,508,498	3,329,470	9,434,292	31,650,696
Average Natural Gas Usage per Appliance[1]	kWh/appliance	23,249	129,356	23,249	129,356
Electricity to Therms Conversion Factor[2]	kWh/therms	29.3	29.3	29.3	29.3
Electric Appliances Installed	Appliances	1,901	754	11,890	7,169
Incremental Cost per Appliance[3]	Dollars/appliance	N/A	$1,033	N/A	$1,033
Total Costs	**Dollars**	**N/A**	**$779,286**	**N/A**	**$6,628,786[4]**

Notes: HVAC = heating, ventilation, and air conditioning; kWh = kilowatt-hours; N/A = not available.

1. Calculated from ComStock outputs for Ventura County. Accessed July 22, 2025, at: https://data.openei.org/s3_viewer?bucket=oedi-data-lake&prefix=nrel-pds-building-stock%2Fend-use-load-profiles-for-us-building-stock%2F2023%2Fcomstock_amy2018_release_2%2Fmetadata_and_annual_results%2Fby_state%2Fstate%3DCA%2Fcsv%2F

2. Metric Conversions. Therms (US) to Kilowatt-hours. Accessed July 22, 2025, at: https://www.metric-conversions.org/energy-and-power/therms-us-to-kilowatt-hours.htm.

3. Peninsula Clean Energy. September 22, 2022. 2035 Decarbonization Feasibility Analysis & Plan. Accessed July 22, 2025, at: https://www.peninsulacleanenergy.com/wp-content/uploads/2022/01/2022.09-BOD-2035-Decarb-Plan-Complete-Analysis-Draft-Plan-1.pdf

4. 2030 total costs are subtracted from 2045 total costs to show the additional total costs needed by 2045.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the existing building decarbonization targets established by Measure BE-3.

---

[80] Due to limited availability of regional cost data, incremental costs for installing heat pump appliances were sourced from Bay Area data, as the information provided by PCE represents the most recent and detailed dataset currently available. Peninsula Clean Energy. September 22, 2022. 2035 Decarbonization Feasibility Analysis & Plan. Accessed July 22, 2025, at: https://www.peninsulacleanenergy.com/wp-content/uploads/2022/01/2022.09-BOD-2035-Decarb-Plan-Complete-Analysis-Draft-Plan-1.pdf

Action ID	Action Description	Phase	Pillars
BE-3.1	Lead a regional study to explore financing mechanisms such as on-bill financing or no/low-interest loans that can make building retrofits financially viable for homeowners and property managers. Assess the financial implications for different building types (single family, multi-family, and commercial) and identify potential barriers or incentives that could drive adoption.	1	F
BE-3.2	Partner with 3C-REN, SCE, and CPA to explore the possibility of targeted incentives and financing mechanisms informed by the financing study as well as bill support/financing. Focus these new programs on bridging upfront cost barriers for building electrification and energy efficiency upgrades, particularly in priority communities, and ensure alignment with existing rebate structures to maximize adoption and fair access.	1-2	SC, $
BE-3.3	Collaborate with local governments, building officials, and energy efficiency experts to create a template retrofit code for existing buildings that prioritizes electrification through zero NOx emission standards, energy efficiency, and climate resilience. This code will set minimum requirements for all building upgrades, including HVAC, insulation, solar-ready roofs, and battery storage integration. Share the model code with jurisdictions to streamline adoption.	2	SC
BE-3.4	Partner with 3C-REN to deliver tailored education and outreach programs that promote building decarbonization and resilience, with a focus on 3C-REN's no-cost energy audits, multifamily retrofit services, workforce training, and available state and federal incentives. Leverage 3C-REN's Resident Learning Center, contractor network, and multilingual community ambassadors to engage property owners, building managers, and contractors—especially in priority communities. Use localized workshops, digital outreach, and coordinated messaging through trusted local channels to boost awareness and participation in electrification and energy savings programs.	1-3	Ed, Pr
BE-3.5	Design outreach programs and financing options specifically targeted at low-income homeowners, renters, and communities disproportionately affected by climate change. Confirm that these programs do not require the identification of personal information. Confirm that these communities have access to subsidies, technical assistance, and affordable retrofit solutions, and remove barriers that prevent priority communities from accessing incentive programs for building retrofits.	1-3	Ed, $
BE-3.6	Pilot a comprehensive retrofit project in a priority area to electrify and decarbonize a multi-family housing complex, demonstrating cost-effective strategies for reducing natural gas use while enhancing building resilience. Use this pilot to gather data, showcase benefits, and develop scalable models for broader regional implementation.	2-3	SC, Pr
BE-3.7	Work with local contractors, trade associations, and energy service providers to support the development of a network of trained professionals capable of implementing building retrofits at scale. Develop regional partnerships that provide incentives for contractors to increase their service capacity, and align with workforce development programs to create a skilled workforce ready to meet demand.	1-2	P

Measure BE-4: Enhance grid performance and reliability through modern infrastructure upgrades.

Measure Description

This measure aims to upgrade electrical infrastructure across the MSA to support a cleaner, more resilient energy system. By modernizing substations, transformers, and distribution lines, and expanding capacity for two-way energy flow, the region can better accommodate renewable energy, reduce outages, and improve grid performance during high-demand events or wildfire conditions. Utilities and local governments will collaborate to prioritize infrastructure needs and identify critical facilities for backup power systems, including renewable microgrids at hospitals, emergency centers, and public buildings.

To support the widespread integration of distributed energy resources (DERs) like solar, wind, battery storage, and virtual power plants, the MSA will support jurisdictions with streamlining permitting processes and technical requirements for grid interconnection. A pilot project in a representative neighborhood will showcase advanced technologies—such as vehicle-to-home charging and AI-based grid management—while targeting high-need areas with elevated wildfire risk, energy burden, or vulnerable populations.

Funding and coordination will be key to accelerating progress. The MSA will work with utilities and partners to pursue grants through state and federal grid resilience programs, bundling projects where possible to highlight regional benefits. Priority will be given to upgrades in communities that face frequent power disruptions or have limited access to clean energy, helping to advance both climate and accessibility goals through smarter, stronger grid infrastructure.

The following table summarizes the key descriptive information for the measure.

Table 24 Measure BE-4 Summary

Enhance grid performance and reliability through modern infrastructure upgrades.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	2,6,7,8
Metrics for Progress Tracking	▪ Number of microgrids installed ▪ Number of electrical infrastructure upgrades completed ▪ Number of pilot projects completed
Applicable EPA Sector(s)	Electricity Consumption

Cost Discussion

To achieve supportive emissions reduction from this measure, individual jurisdictions will pay for their own microgrid and battery storge systems for their facilities. These systems cost up to $5,000 per kilowatt of energy generated, including generators, storage, and control systems.[81] The total cost will vary by facility size and system design, with additional expenses for permitting,

---

[81] U.S. Department of Energy Grid Deployment Office. January 2024. Microgrid Overview. Accessed July 18, 2025, at: https://www.energy.gov/sites/default/files/2024-02/46060_DOE_GDO_Microgrid_Overview_Fact_Sheet_RELEASE_508.pdf

interconnection, and maintenance. While upfront capital costs can be significant, microgrids provide long-term savings through demand management, reduced outage costs, and improved energy resilience, especially in wildfire-prone areas.

Modernizing the broader grid to accommodate distributed energy resources (DERs), automate grid management, and improve outage response will also require substantial investment. Costs will depend on the scope of upgrades from replacing aging transformers and substations to deploying remote sensors, two-way smart meters, and advanced grid controls. However, pilot projects, such as virtual power plants, vehicle-to-home charging, and artificial intelligence (AI)-driven grid optimization can be cost-shared with utility partners (e.g., SCE, CPA) and funded through State and federal programs. Funding sources include the CPUC's Grid Modernization and Resiliency programs and Department of Energy grid resilience grants. By bundling regional needs and demonstrating benefits for priority communities, the MSA can improve its competitiveness for external funding and reduce the burden on individual jurisdictions.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the grid performance enhancement goals established by Measure BE-4.

Action ID	Action Description	Phase	Pillars
BE-4.1	Work with the jurisdictions in the MSA to utilize existing feasibility studies that have been completed to identify priority areas for building- and community-scale microgrids and alternative technologies such as fuel cells and grid paralleling, to support demand management, peak shaving, and load shifting to increase grid resilience and mitigate wildfires. Identify and prioritize renewable energy microgrid backup power projects at critical facilities such as hospitals, government buildings, libraries, etc.	1	F, Pr
BE-4.2	Work with SCE to identify and prioritize the top community needs related to electrical infrastructure upgrades in the MSA, in alignment with the County's COS-U: Assessment of land near electrical transmission and distribution lines program. Once prioritized, leverage state and federal programs to modernize substations, transformers, and distribution lines to reduce outages and improve energy flow management, such as upgrading aging equipment, increasing automation and remote monitoring capabilities, and enhancing capacity to handle two-way energy flows from renewable energy systems and energy storage.	1-2	F, SC
BE-4.3	Develop regional policies and infrastructure upgrades that allow for smooth integration of solar, wind, battery storage, and other distributed energy resources (DERs) at the community level, such as streamlining permitting and technical requirements to make it easier for facilities and homes to connect renewable and backup systems to the grid.	2	SC
BE-4.4	Partner with SCE, CPA, and/or 3C-REN to implement a pilot project showcasing advanced grid technologies such as virtual power plants (VPPs), vehicle-to-home (V2H) charging, and AI-driven grid management tools. Invite jurisdictions to identify a representative community or neighborhood to utilize as a pilot — prioritizing areas with high energy demand, wildfire risk, or vulnerable populations. The pilot will integrate distributed energy resources like rooftop solar, battery storage, and smart demand response systems to optimize local grid stability and reduce reliance on fossil fuels during peak demand.	2-3	P

Action ID	Action Description	Phase	Pillars
BE-4.5	Prioritize grid upgrades in priority communities that experience higher rates of outages or energy burden. Coordinate with utilities to ensure these neighborhoods benefit early from infrastructure improvements such as microgrids, battery storage, and smart meters.	1-3	Pr
BE-4.6	Leverage state and federal funding sources such as the California Public Utilities Commission's (CPUC) Grid Modernization and Resiliency programs and Department of Energy grid resilience funds to support infrastructure upgrades. Coordinate with local utilities to bundle funding requests and demonstrate regional benefits to increase competitiveness.	1-2	$

4.4   Transportation and Mobility

Transportation and mobility incorporate both on- and off-road transportation-related equipment, each of which are discussed below.

On-road Transportation

On-road transportation generates the greatest amount of GHG emissions in the region, which aligns with the broader State emissions due to the expansive roadway network and limited safe and reliable public and active transportation options. This sector contributes 45 percent of emissions in the MSA at 2,725,459 MT CO_2e. Traditional land use planning that spreads housing and resources apart results in GHG emissions that are attributable to the vehicle miles traveled (VMT) required to go to various destinations. These transportation GHG emissions are generated from the use of fossil fuels in vehicles. It has been determined that in metropolitan regions, suburbs emit up to four times the household emissions of their urban cores and homes located in more densely populated neighborhoods have a carbon footprint that is 50 percent below the national average.[82] The combustion of fossil fuels in vehicles is also a significant source of health impacts to the communities living around the transportation infrastructure as it is responsible for nearly 80 percent of NO_x pollution, and 90 percent of diesel particulate matter pollution.[83] Exposure to high levels of poor air quality can result in increased cases of asthma and respiratory illnesses, worsen existing heart and lung conditions, thereby increasing emergency room visits and absences from work and school, as well as premature death.[84] These air pollutants also threaten crops, trees, and vegetation, which is especially impactful in the region that depends so much on agriculture for economic prosperity. Reductions in local crops could cause cascading impacts throughout the Country, which relies heavily on produce grown in this region.

To reduce the GHG emissions and the health impacts from other associated air pollutants related to existing transportation, there is a need for increased EV use, increased transit accessibility and operations, and increased active transportation, including biking, walking, skating, and rolling. Additionally, as land use planning continues to be refined, jurisdictions must locate higher density housing near income-matched jobs with access to these multimodal transportation options. Ultimately, to significantly reduce emissions, it will be essential to decrease the number of miles driven in on-road fossil fueled-powered vehicles. California has enacted regulations to reduce GHG emissions from passenger vehicles to the maximum and cost-effective extent feasible and the measures in this sector will support the State's initiatives. The measure(s) in this sector also align with the Ventura Council of Governments (VCOG) and VCTC's Ventura County CEQA VMT Adaptive Mitigation Program,[85] a simplified mitigation program to reduce residual significant VMT impacts with a focus on affordable housing development. While the program provides a template for CEQA VMT mitigation, it can be considered for use with any project that generates VMT.

---

[82] Tamura, M., Kane, J. April 26, 2023. It's not just cities—suburbs and exurbs need to adopt and implement climate plans too. Accessed July 8, 2025, at: https://www.brookings.edu/articles/its-not-just-cities-suburbs-and-exurbs-need-to-adopt-and-implement-climate-plans-too/

[83] California Energy Commission (CEC). 2024. Transforming Transportation. Accessed July 8, 2025, at: https://www.energy.ca.gov/about/core-responsibility-fact-sheets/transforming-transportation

[84] U.S. Environmental Protection Agency. 2023. Learn About Impacts of Diesel Exhaust and the Diesel Emissions Reduction Act (DERA). Accessed July 8, 2025, at: https://www.epa.gov/dera/learn-about-impacts-diesel-exhaust-and-diesel-emissions-reduction-act-dera

[85] Ventura County Transportation Commission. 2023. Ventura County CEQA Vehicle Miles Traveled Adaptive Mitigation Program. Accessed June 17, 2025, at: https://www.goventura.org/wp-content/uploads/2023/09/Ventura-County-AMP-Final-Report_Approved-by-VCTC-05.12.2023.pdf

Upon maximum VMT reduction possible, and a decarbonized energy system, it will be essential to electrify the remaining vehicles on the road so the MSA can benefit from increasingly clean electricity. Additionally, reducing tailpipe air pollution through EV adoption provides public health benefits as it reduces a major source of outdoor air pollution, which often disproportionately impacts priority communities. The Ventura County Electric Vehicle Ready Blueprint (EV Blueprint) was developed in 2019 through a collaborative process designed to accelerate and support electric vehicle and charging infrastructure deployment throughout Ventura County, in alignment with the State of California's goal to deploy 5 million Zero Emission Vehicles (ZEVs) by 2030.[86] The EV Blueprint includes a goal of installing 3,241 EV charging stations by 2025. As of February 2024, the County currently has 1,025 electric vehicle chargers. This lack of accessible charging infrastructure is a primary barrier to EV adoption, especially for community members who live in multi-family houses or are renters and may be unable to install electric vehicle charging equipment onsite.

Providing expanded access to mobility programs and transit service will be a vital part of reducing transportation emissions for the MSA, as well as improving transportation accessibility in the region. As such, the CCAP measures will include initiatives to install EV chargers, support infrastructure improvements and transportation operations, develop active transportation corridors, increase public transportation share, and increase passenger ZEV use.

Off-road Equipment

A variety of off-road equipment is operated in the MSA, including land and garden equipment as well as other outdoor power equipment, to maintain landscaping, parks, and open space, among other uses. Off-road fuel use was projected using data provided in the CARB OFFROAD model.[87] Off-road equipment accounted for seven percent of emissions in the Ventura MSA in 2022 at 454,763 MT CO_2e.

Similarly to on-road transportation, off-road equipment emissions are largely due to fossil fuel burning, particularly diesel. Diesel engines produce a mix of air pollutants, including diesel particulate matter (DPM), which consists of tiny particles smaller than 1 micron and contributes to $PM_{2.5}$, a form of fine particulate pollution linked to serious health risks.[88] Most $PM_{2.5}$ pollution comes from combustion sources such as motor vehicle fuel use, electricity generation, and wood burning, with studies showing strong correlations to respiratory and cardiovascular diseases.[89] In California, DPM makes up about 8 percent of outdoor $PM_{2.5}$ levels, though concentrations vary across the state due to differences in pollution sources.[90] These pollutants also pose a serious risk to crops, forests, and plant life, which can be particularly concerning where agriculture plays a role in the local economy. A decline in crop production in the MSA could trigger widespread impacts across the nation, which depends heavily on the fruits and vegetables grown within the MSA.

California approved amendments to Assembly Bill 1346 in 2022, which requires fleets to phase out use of the oldest and highest polluting off-road diesel vehicles in California, prohibits the addition of high-emitting vehicles to a fleet, and requires the use of R99 or R100 renewable diesel in off-road

---

[86] County of Ventura. July 2019. Ventura County Electric Vehicle Ready Blueprint. Accessed June 17, 2025, at: https://vcportal.ventura.org/CEO/energy/ev/Ventura_County_Electric_Vehicle_Ready_Blueprint_July_2019.pdf

[87] California Air Resource Board (CARB). 2024. Mobile Source Emissions Inventory Off-road (OFFROAD2021 v1.0.7). Accessed June 17, 2025, at: https://arb.ca.gov/emfac/offroad/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

[88] California Air Resources Board (CARB). Overview: Diesel Exhaust and Health. Accessed June 17, 2025, at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health

[89] Ibid.

[90] Ibid.

diesel vehicles.[91] The off-road sector accounts for roughly 14 percent of California's total NOx emissions.[92] This makes it the second largest contributor among mobile sources, with only on-road trucks producing more. From 2024 to 2038, newly adopted amendments are expected to further cut NOx and fine particulate matter (PM 2.5) emission beyond what current regulations achieve. The CCAP includes a measure focused on electrifying or otherwise decarbonizing off-road equipment and replacing conventional diesel consumption with renewable diesel, in line with the State of California. These reductions in harmful air pollutants will directly benefit both workers utilizing this equipment and the nearby communities exposed to the emissions.

Measure TM-1: Support a transportation sales tax measure to fund prioritized transportation infrastructure improvements and transit operations across the MSA.

Measure Description

This measure supports the development of a regionally coordinated transportation sales tax proposal to fund critical infrastructure improvements and expand transit service across the MSA. In collaboration with VCTC and local jurisdictions, the MSA will create a public-facing framework that outlines how funds would be allocated across cities, unincorporated areas, and priority communities. Draft spending categories will address a range of needs, including bus service, passenger rail, active transportation, paratransit, and environmental enhancements like sound walls and wildlife crossings.

The measure will be supported by a robust outreach campaign led in partnership with community-based organizations, transit providers, and local businesses. Public education materials — including multilingual videos, infographics, and town halls — will explain unmet transportation needs and how a sales tax could address funding gaps while delivering environmental, economic, and accessibility benefits. Community engagement will also inform project selection, with emphasis on data-driven tools and alignment with existing plans such as the Ventura County Active Transportation Plan and VCTC's Comprehensive Transportation Plan.

The following table summarizes the key descriptive information for the measure.

---

[91] California Air Resources Board (CARB). August 2023. Amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation. Accessed June 17, 2025, at: https://ww2.arb.ca.gov/resources/fact-sheets/fact-sheet-renewable-diesel-fuel-requirements

[92] CARB. November 2022. CARB approves amendments to the Off-Road Regulation to further reduce emissions. Accessed June 17, 2025, at: https://content.govdelivery.com/accounts/CARB/bulletins/338842a

Table 25 Measure TM-1 Summary

Support a transportation sales tax measure to fund prioritized transportation infrastructure improvements and transit operations across the MSA.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	21,24
Metrics for Progress Tracking	▪ Revenue generated from sales tax ▪ Number of projects funded through sales tax
Applicable EPA Sector(s)	Transportation

Cost Discussion

Developing and passing a regional transportation sales tax measure will require a coordinated investment in planning, outreach, and interested party engagement across the MSA. Initial costs typically include staff time, legal and fiscal analysis, polling, public outreach materials, and ballot preparation, which can range from several hundred thousand to over a million dollars, depending on the scale and depth of engagement. These upfront investments are essential for building public trust, establishing balanced representation and creating a transparent framework for how funds would be allocated.

If approved by voters, a transportation sales tax can generate substantial, long-term funding to support infrastructure improvements, transit operations, and active transportation projects. Counties such as Monterey[93] and Los Angeles[94] have successfully implemented similar measures, anticipated to generate $600 million and $40 billion, respectively, over 30-year periods, with revenues distributed among jurisdictions and prioritized toward safety, access, and mobility. A similar effort in the MSA could create a stable and flexible funding source, enable more balanced investment, and enhance the region's ability to secure matching state and federal transportation grants.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the transportation sales tax goals established by Measure TM-1.

---

[93] Transportation Agency for Monterey County. August 15, 2023. Measure X Citizens Oversight Committee. Accessed July 18, 2025, at: https://tamcmonterey.specialdistrict.org/files/4dd31385f/XTOC%2BAgenda%2BPacket-2.pdf

[94] Ballotpedia. Los Angeles County Sales Tax, Measure R (November 2008). Accessed July 18, 2025, at: https://ballotpedia.org/Los_Angeles_County_Sales_Tax%2C_Measure_R_%28November_2008%29

Action ID	Action Description	Phase	Pillars
TM-1.1	Work with the Ventura County Transportation Commission (VCTC) and local jurisdictions to develop a transparent, public-facing draft framework that outlines how funds from a future sales tax measure could be distributed among cities, unincorporated communities, and priority populations. This includes draft spending categories (e.g., bus service, passenger rail, sidewalks/bike lanes, paratransit, sound walls, wildlife connectivity improvements, etc.) that address all interested parties' priorities. Collect feedback and assess the viability of success with the proposed framework.	1-2	P, Pr
TM-1.2	Collaborate with community-based organizations (CBOs), chambers of commerce, and transit providers (e.g., VCTC, Gold Coast Transit District, Ventura Transit System, Simi Valley Transit, Moorpark Transit, Camarillo Area Transit, Thousand Oaks Transit, Metrolink, and Amtrak) to educate the public on the MSA's unmet transportation needs, the environmental and economic benefits of improved active and public transportation infrastructure, and how a sales tax could be used to fund solutions. Use multilingual videos, infographics, and town halls to address misconceptions and clearly identify regional benefits.	1-2	Ed, P
TM-1.3	Leverage existing transportation plans, ridership and service data, cost estimates, priority determination tools, and maps identifying priority communities to inform project selection and prioritized fund allocation as part of the proposed sales tax measure framework. Host public information sessions to explain existing transit funding gaps, infrastructure needs, and implementation considerations.	2	Ed, Pr
TM-1.4	Assist cities and agencies to prepare project concepts aligned with Ventura County's Active Transportation Plan (ATP)[95] and VCTC's Comprehensive Transportation Plan (CTP).[96] Emphasize projects that benefit priority communities and that are "shovel-ready" or easily scalable to increase public confidence that funds will be used efficiently.	1-2	P, F, Pr
TM-1.5	Align messaging and provide a consistent, MSA-wide media strategy that clearly states the benefits of the measures, such as job creation, cleaner air, reduced traffic, and greater access for seniors and youth. Leverage social media, local radio, and community newsletters to build widespread awareness.	1	Ed, P

Measure TM-2: Implement priority projects identified in Ventura County's Active Transportation Plan (ATP), Ventura County Transportation Commission's (VCTC) Comprehensive Transportation Plan (CTP), Santa Paula Branch Line (SPBL) Master Plan, and the Ventura County Regional Bicycle Wayfinding Plan to increase active transportation mode share in the MSA from 11% to 13% by 2030 and 20% by 2045 and convert key roadway sectors into active transportation corridors.

Measure Description

This measure supports the expansion of walking, biking, and e-mobility throughout the MSA by implementing priority projects from regional plans such as the Ventura County Active Transportation Plan (ATP), VCTC's Comprehensive Transportation Plan (CTP), and the Santa Paula Branch Line (SPBL) Master Plan. By building out a safe and connected active transportation network,

---

[95] County of Ventura. February 2024. Ventura County Active Transportation Plan. Accessed July 24, 2025, at: https://s47609.pcdn.co/wp-content/uploads/2024/03/Active-Transportation-Plan.pdf

[96] Ventura County Transportation Commission. February 2023. Ventura County Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/vc-county-comprehensive-transportation-plan/

the MSA aims to increase active mode share, reduce VMT, and improve public health and access to low-cost mobility options, particularly in priority communities.

Key actions include a region-wide education and outreach campaign that promotes the benefits of active transportation and provides safety resources in multiple languages. Local jurisdictions will receive model zoning language to support pedestrian- and bike-friendly design in new developments near transit hubs and commercial corridors. The MSA will also collaborate with Caltrans and the District 7 Pedestrian and Bicycle Advisory Committee to coordinate implementation of bicycle and pedestrian infrastructure along key state highways.

To help overcome funding barriers, the MSA will assist jurisdictions in identifying sustainable funding strategies, including pursuing state grant opportunities and establishing a shared Sidewalk Asset Management and Maintenance Plan. Open Streets events will be expanded to showcase car-free zones, build community support, and test safety measures. Priority will be placed on projects that enhance regional connectivity and support access to jobs, schools, and services for low-income residents.

The following table summarizes the key descriptive information for the measure.

Table 26 Measure TM-2 Summary

Implement priority projects identified in Ventura County's Active Transportation Plan (ATP), Ventura County Transportation Commission's (VCTC) Comprehensive Transportation Plan (CTP), Santa Paula Branch Line (SPBL) Master Plan, and the Ventura County Regional Bicycle Wayfinding Plan to increase active transportation mode share in the MSA from 11% to 13% by 2030 and 20% by 2045 and convert key roadway sectors into active transportation corridors.	
GHG Emissions Reduction (2030)	14,776 MT CO$_2$e
GHG Emissions Reduction (2045)	68,813 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	21,23,24,29,30
Metrics for Progress Tracking	**2030 Metrics** ▪ Number of priority projects implemented ▪ Miles of bike lanes built ▪ 13% active transportation mode share **2045 Metrics** ▪ Number of priority projects implemented ▪ Miles of bike lanes built ▪ 20% active transportation mode share
Applicable EPA Sector(s)	Transportation

Cost Discussion

Actions under this measure support implementation of regional plans, including Ventura County's ATP, VCTC's CTP, and the SPBL Master Plan. Cost estimates are based on project-level data and mileage of new bike and pedestrian infrastructure identified in these plans. The Ventura County Regional Bicycle Wayfinding Plan primarily addresses signage design and associated costs, which are likely embedded within broader project cost estimates in the other plans; therefore, standalone signage costs from the Wayfinding Plan are not assessed as part of this measure.

The Ventura County ATP includes a prioritized list of projects, with cost estimates provided for select Tier 1 projects (priority scores greater than or equal to 55, on a 0 to 100 scale). For this measure, only Tier 1 projects with available cost estimates are assumed to be implemented. By 2030, it is assumed the top ten ATP projects (priority scores greater than or equal to 75) will be completed, while the remaining Tier 1 projects are assumed to be implemented by 2045.[97]

The VCTC CTP outlines a countywide project list of new bike lanes requiring additional funding and targeting completion by 2040. In total, there are 115 new miles of bike lane included in the VCTC CTP. For cost estimation purposes, it is assumed that 20 miles of new bike lanes will be installed by 2030, with the remaining mileage completed by 2045.[98] While there is potential overlap between projects listed in the CTP and those identified in the County's ATP, most Tier 1 bike lane projects in the ATP do not include cost estimates. Therefore, incorporating CTP project costs into this measure is considered a reasonable and conservative approach.

The SPBL Master Plan proposes 20 miles of new bike and pedestrian trail from Saticoy to Piru, plus upgrades to existing facilities, totaling 27 miles of improvements. The plan is currently in development (2025 to 2026), and it is assumed construction and completion will occur between 2030 and 2045.[99] The City of Santa Paula's SPBL Trail Extension project is tangentially associated with the SPBL Master Plan and currently funded at $1.5 million to construct 2.5 miles of new trail, which is not included in the 27 miles of improvements above. The estimated cost for implementing trail improvements under the Master Plan is assumed to be approximately $600,000 per mile.[100] This per-mile estimate is used to inform cost assumptions for the full 27 miles of new and upgraded active transportation trail improvements planned along the Santa Paula Branch Line.

A summary of project assumptions and associated cost estimates is provided in Table 27 below.

---

[97] County of Ventura. 2024. Ventura County Active Transportation Plan. Accessed July 24, 2025, at: https://s47609.pcdn.co/wp-content/uploads/2024/03/VenturaCo_ATP_Report_Appendices.pdf

[98] Ventura County Transportation Commission (VCTC). 2023. Ventura County Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/wp-content/uploads/2023/05/4_VCTC_CTP_Final-Report_Feb2023.pdf

[99] Ventura County Transportation Commission (VCTC). 2025. VCTC Santa Paula Branch Line Trail Master Plan Update. Accessed July 24, 2025, at: https://www.goventura.org/spbl-trail-master-plan/

[100] City of Santa Paula. 2025. Santa Paula Trail Connectivity Project. Accessed July 24, 2025, at: https://spcity.org/797/Santa-Paula-Trail-Connectivity-Project

Table 27 Measure TM-2 Cost Summary

	Metrics			Cost	
Regional Plan	2030	2045	Unit	2030	2045
Ventura County ATP	$4,964,579	$22,956,753	Dollars	$4,964,579	$22,956,753
VCTC CTP[1]	20	95	Miles	$2,000,000	$9,500,000
SPBL Plan[2]	0	27	Miles	$0	$16,200,000
Total Costs	N/A	N/A	Dollars	$6,964,579	$48,656,753

Notes: ATP = Active Transportation Plan; VCTC = Ventura County Transportation Commission; CTP = Comprehensive Transportation Plan; SPBL = Santa Paula Line Branch; N/A = not applicable.

1. Cost estimates are informed by resurfacing cost data from the U.S. Federal Highway Administration, which indicates a range of $38,000 to $100,000 per mile depending on whether bicycle network improvements are implemented concurrently with roadway resurfacing. For this estimate, it is assumed that projects will be implemented as standalone improvements, resulting in an estimated cost of $100,000 per mile.
U.S. Department of Transportation. Federal Highway Administration. Bicycle and Pedestrian Program. Accessed July 24, 2025, at: https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/page04.cfm#cost_a2

2. Cost estimates are based on an assumed rate of $600,000 per mile of bike trail, derived from the funding allocated for Santa Paula's SPBL trail extension project, which covers approximately 2.5 miles of trail.
Santa Paula. Santa Paula Trail Connectivity Project. Accessed July 24, 2025, at: https://spcity.org/797/Santa-Paula-Trail-Connectivity-Project

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the active transportation goals established by Measure TM-2.

Action ID	Action Description	Phase	Pillars
TM-2.1	Launch an MSA-wide active transportation awareness campaign, established in science-based engagement techniques,[101] that highlights the benefits and safety features of priority active transportation projects, specifically projects that catalyze e-mobility. Target local policymakers, school districts, business associations, public health agencies, and parent organizations with actions such as: ▪ Developing and distributing regionally consistent educational materials on safe routes and active commuting options, with specific maps or locational information provided to supplement the educational materials. ▪ Creating multilingual media campaigns (e.g., social media, radio, print, etc.) emphasizing the health, environmental, and financial benefits of active transportation. Additionally, include information on how to utilize the active transportation networks safely both when actively commuting (including information on safety equipment such as helmets and how to use and maintain them), and when in a vehicle adjacent to active transportation networks.	1	Ed
TM-2.2	Develop model zoning language for new developments near transit hubs and major commercial corridors to integrate pedestrian- and bike-friendly designs, such as bicycle parking and charging infrastructure, protected bike lanes, widened sidewalks, and traffic-calming measures. These model zoning standards will be replicable and streamlined so they can be easily adopted	1	SC, P

---

[101] Science-based engagement techniques include Community-Based Social Marketing (CBSM), which applies behavior change strategies grounded in social psychology to promote sustainable actions at the community level. CBSM campaigns can be further strengthened by incorporating Principles of Persuasion—such as authority, reciprocity, and social proof—which are proven to influence decision-making and enhance campaign effectiveness. More information available at: https://cbsm.com/

Action ID	Action Description	Phase	Pillars
	across all jurisdictions, promoting consistent and sustainable urban development throughout the MSA that supports active transportation infrastructure investments.		
TM-2.3	Partner with Caltrans to identify which projects they have prioritized and identify opportunities to integrate existing active transportation projects contained in regional plans into their upcoming implementation projects. Additionally, work with District 7 Pedestrian and Bicycle Advisory Committee (PBAC) to track progress on implementation of bicycle and pedestrian projects in the MSA. Conduct community engagement regarding opportunities to include safe biking infrastructure in CalTrans highway upgrade projects associated with common bicycle routes along State Route 1 (Pacific Coast Highway), State Route 23, State Route 33, State Route 126, State Route 118, and State Route 150.	1-2	P, F
TM-2.4	Assist cities and the County to identify sustainable mechanisms that will fund the implementation of priority active transportation projects that increase regional connectivity and bring benefits to priority communities. Explore funding mechanisms such as Transformative Climate Communities (TCC) overseen by the Strategic Growth Council, Sustainable Transportation Equity Project (STEP) overseen by CARB, and Urban Greening Grants overseen by the California Natural Resources Agency.	1-2	$, P, F
TM-2.5	Establish template zoning language that could serve as a replicable model for all jurisdictions in the MSA with requirements for strategically locating affordable housing along active transportation and transit corridors to enhance access for low-income residents to safe, reliable, and low-cost mobility options, to benefit from reduced transportation burdens, improved access to jobs and services, and enhanced resilience to climate and economic stressors.	1	Pr, SC
TM-2.6	Build off the success of regional open streets such as downtown Santa Barbara and existing events that utilize streets to provide active commuter-friendly activities and implement new "Open Streets" events, where suitable, to demonstrate the potential of a car-free district. Use these "Open Street" events to explore enforcement mechanisms for unsafe biking within car-free areas, such as posted speed limits or an infraction system. Continue to gather community input before permanent changes are implemented.	2	F, Ed
TM-2.7	Coordinate with local jurisdictions who do not have existing plans or have antiquated plans to develop a unified Sidewalk Asset Management and Maintenance Plan that identifies priority repair areas based on safety, priority, and access needs. The plan will include a shared inventory of existing infrastructure conditions, cost estimates, and potential funding sources (e.g., SB 1, ATP grants), enabling jurisdictions to pool resources, pursue joint grant applications, and schedule repairs more efficiently helping overcome budget constraints and fragmented responsibilities across agencies.	2	SC, P, $

Measure TM-3: Implement priority projects identified in VCTC's Comprehensive Transportation Plan (CTP) and Gold Coast Transit District's (GCTD) Building Transit Supportive Communities (BTSC) Plan to increase public transportation mode share in the MSA from 0.3% to 3% by 2030 and 10% by 2045.

Measure Description

This measure aims to expand and improve public transit service across the MSA to increase ridership, reduce reliance on single-occupancy vehicles, and promote fair access to mobility. Building on regional plans such as VCTC's CTP and GCTD's Building Transit Supportive Communities

Plan, the MSA will assess transit needs using Short Range Transit Plans and the Transportation Integration and Efficiency Study (TIES) study, with input from community-based organizations, residents, and other interested parties to prioritize service enhancements that meet the greatest needs.

Outreach efforts will promote transit as a flexible, convenient, and sustainable option through multilingual campaigns, educational materials, and partnerships with schools, colleges/universities, and employers. The MSA will identify long-term funding for programs like Youth Ride Free and College Ride and develop regionally consistent parking and Transportation Demand Management (TDM) policies to reduce car dependency and promote mode shift. Pilot projects such as micro-mobility hubs and on-demand shuttles will be explored using SCAG guidance to improve first- and last-mile connections.

To advance accessibility, the MSA will conduct a transit priority audit to identify service gaps, improve transit frequency in underserved areas, and expand fare reduction programs for low-income and senior riders. Collaborations with transit providers will focus on innovations like e-bike racks on buses and clear visual resources to support integration of micromobility with public transit, helping to reduce barriers and improve the overall transit experience.

The following table summarizes the key descriptive information for the measure.

Table 28 Measure TM-3 Summary

Implement priority projects identified in VCTC's Comprehensive Transportation Plan (CTP) and Gold Coast Transit District's (GCTD) Building Transit Supportive Communities (BTSC) Plan to increase public transportation mode share in the MSA from 0.3% to 3% by 2030 and 10% by 2045.	
GHG Emissions Reduction (2030)	31,248 MT CO$_2$e
GHG Emissions Reduction (2045)	91,434 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	21,23,24,30
Metrics for Progress Tracking	**2030 Metrics** ▪ Number of priority projects implemented ▪ Number of annual public transit riders ▪ 3% public transit mode share **2045 Metrics** ▪ Number of priority projects implemented ▪ Number of annual public transit riders ▪ 10% public transit mode share
Applicable EPA Sector(s)	Transportation

Cost Discussion

Costs associated with shifting transportation from passenger vehicles to public transit are based on estimated increases in ridership. GHG emissions reduction for Measure TM-3 are calculated using a target mode shift from single-occupancy vehicle (SOV) commuting trips to public transit. The number of vehicle trips reduced serves as the basis for estimating the required increase in transit ridership. For this assessment, each reduced SOV trip is assumed to correspond to one additional public transit passenger. According to VCTC's Comprehensive Transportation Plan, the average cost

of providing transit service is approximately $13 per passenger.[102] This cost estimate does not include the cost of expanding transit routes, purchasing additional buses, or other capital improvements as these costs are currently unknown as they are dependent on the implementation timeline, vehicles purchased, and rebates/incentives available to offset costs. Resulting cumulative operational cost estimates from increased public transit use are summarized in Table 29 below.

Table 29 Measure TM-3 Cost Summary

Variable	2030	2045	Units
Cumulative Total SOV Trips[1]	3,641,969,014	10,544,279,155	Trips
Target Mode Share Increase[1]	2.74%	9.74%	Percent
Cumulative SOV Trips Reduced[2]	59,663,610	679,602,157	Trips
Transit Service Cost[3]	$13	$13	Dollars/passenger
Total Cost	**$775,626,934**	**$8,834,828,039**	Dollars

Notes: SOV = single-occupancy vehicle. Values may not add due to rounding.

1. For 2030, value reflects the aggregate trips taken over the course of 2026 through 2030. For 2045, value reflects aggregate trips over the course of 2030 to 2045. Trip data is determined by linearly interpolating VMT and trips per mile metrics used in the CCAP GHG Inventory (see Appendix A Greenhouse Gas Inventory Analysis Report) and to quantify GHG reductions for Measure TM-3 (see Appendix C Measure Quantification Analysis Report).

2. SOV trips reduced (cumulative) for each target year represent the total reduction in trips over the periods 2026–2030 and 2030–2045, respectively. Reductions were estimated by linearly interpolating total SOV trips and mode share changes over time, then multiplying these values to determine annual trip reductions. Cumulative reductions were calculated by summing the annual SOV trips reduced over each implementation phase. This approach reflects the gradual scaling of operations and the associated cumulative operational costs over time.

3. Although Measure TM-3 targets increased ridership for both VCTC and the Gold Coast Transit District, only VCTC data on operating cost per passenger was available. As a result, VCTC's cost data was used to estimate costs associated with the projected ridership increases.
    Ventura County Transportation Commission. February 2023. Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/wp-content/uploads/2023/05/4_VCTC_CTP_Final-Report_Feb2023.pdf

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the public transportation goals established by Measure TM-3.

Action ID	Action Description	Phase	Pillars
TM-3.1	Leverage Short Range Transit Plans and the Transportation Integration and Efficiency Study (TIES)[103] to assess existing routes, schedules, and facilities across all jurisdictions in the MSA. Involve residents, CBOs, and other interested parties to prioritize projects that meet the most urgent needs or provide opportunities for the biggest improvements in ridership.	1	F
TM-3.2	Develop a targeted outreach and marketing campaign that promotes a flexible, "menu-based" approach to public transportation—encouraging the replacement of some single-car trips with a combination of active and public transit options. Incorporate educational initiatives on how to effectively use public transit, including bus riding tips, while also addressing and challenging the stigma that public transit is "inferior." Focus on promoting the benefits of public transportation and shifting	1-2	Ed

---

[102] Ventura County Transportation Commission (VCTC). 2023. Ventura County Comprehensive Transportation Plan. Accessed July 24, 2025, at: https://www.goventura.org/wp-content/uploads/2023/05/4_VCTC_CTP_Final-Report_Feb2023.pdf

[103] Ventura County Transportation Commission. Transit Integration and Efficiency Study. Accessed July 24, 2025, at: https://www.goventura.org/vctc-transit/ties/

Action ID	Action Description	Phase	Pillars
	perceptions to emphasize its value as a sustainable, convenient, and accessible option for all.		
TM-3.3	Develop templatized parking policies (e.g., maximum parking limits, shared parking policies, and pricing mechanisms) for regional adoption to reduce excessive parking availability, traffic congestion, and sprawl, while encouraging the use of sustainable transportation options such as public transit, biking, walking, and carpooling.	2	SC
TM-3.4	Continue to identify and secure funding to support the Youth Ride Free and College Ride programs for long-term sustainability.	1-2	$
TM-3.5	Develop standardized Transportation Demand Management (TDM) guidelines and requirements for commercial and industrial employers with a specific number of employees.	2	SC
TM-3.6	Leverage Southern California Association of Government's (SCAG) Mobility Hub Design and Implementation Guide[104] to explore alternative forms of public transit, such as micro transit including on-demand shuttles, community trolleys, car share programs, bike share programs, and scooter share programs. Identify potential funding sources (e.g., grants, local taxes, local business sponsorship, discretionary funds, etc.) and barriers and opportunities for how such a micro-mobility program may enhance active transportation or public transit use. Implement a micro mobility pilot hub in a city in the MSA such by choosing strategic locations along bike paths or transit routes.	1	F
TM-3.7	Advance transit through targeted service improvements and fare policies that prioritize underserved populations. Conduct a priority audit to identify gaps in access, frequency, and affordability, and use the findings to expand service in priority communities, reduce or eliminate fares for seniors and low-income riders, and improve first/last-mile connections. Partner with CBOs to co-design solutions and provide meaningful public engagement from historically marginalized populations.	2-3	Pr
TM-3.8	Partner with the transit providers in the region to identify and apply for funding for e-bike racks on buses and promote visual resources showing the community how to utilize these tools to empower the community to confidently integrate micromobility into their travel routines, thereby reducing barriers to adoption and supporting mode shift goals.	2-3	P, Ed

Measure TM-4: Increase passenger zero-emission vehicle (ZEV) sales and adoption to 30% by 2030 and 100% by 2045 by expanding EV charging infrastructure across the MSA.

Measure Description

This measure focuses on accelerating the transition to zero-emission passenger vehicles by expanding access to EV charging infrastructure in homes, workplaces, and public spaces. A regional template ordinance will support local adoption of EV-ready requirements for new development, retrofits, and large employers. Additional policies will prioritize charger installations in multi-family and commercial properties, helping residents overcome common barriers like limited parking or electrical capacity.

---

[104] Southern California Association of Governments. March 13, 2025. SCAG's 'Mobility Hub Design and Implementation Guide' Helps Local Planners Overcome Obstacles. Accessed July 24, 2025, at: https://scag.ca.gov/news/scags-mobility-hub-design-and-implementation-guide-helps-local-planners-overcome-obstacles

To support streamlined deployment, the MSA will issue a regional Request for Proposals (RFP) to identify preferred charging station providers and installers. Coordination with utilities and CPA will help align infrastructure siting with grid readiness, streamline permitting, and expand access in high-impact locations. Updated analysis through the Ventura County EV Ready Blueprint will identify opportunities for curbside chargers, medium- and heavy-duty vehicle charging, and regional e-bike infrastructure, particularly in areas without off-street parking.

A broad outreach campaign will engage businesses, developers, dealerships, and property owners through educational materials, technical guidance, and public events. Special focus will be placed on increasing access in priority and rural communities using available state and federal grants. The measure also supports piloting innovative programs like EV car share at multi-family properties and electrifying vans in the farmworker vanpool program, creating benefits that extend beyond passenger vehicles to support accessibility and workforce mobility.

The following table summarizes the key descriptive information for the measure.

Table 30 Measure TM-4 Summary

Increase passenger zero-emission vehicle (ZEV) sales and adoption to 30% by 2030 and 100% by 2045 by expanding EV charging infrastructure across the MSA.	
GHG Emissions Reduction (2030)	293,331 MT CO$_2$e
GHG Emissions Reduction (2045)	1,192,173 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	2,19,21,24,27
Metrics for Progress Tracking	**2030 Metrics** ▪ 30% ZEV population ▪ 5,082 public EV charging ports installed **2045 Metrics** ▪ 100% ZEV population ▪ 20,720 public EV charging ports installed
Applicable EPA Sector(s)	Transportation

Cost Discussion

Actions for this measure focus on increasing passenger EV adoption. The costs to achieve this goal are based on the infrastructure costs to install public EV chargers. An effective EV charging network requires a mix of public Level 2 chargers and public DC Fast chargers. According to the Department of Energy's EVI-Pro Lite tool which models daily charging needs in a region, about six percent of the public charging ports in the MSA will need to be DC Fast Chargers while the remaining may be Level 2 charging ports.[105] Including hardware, it costs an average of $7,275 to install a (networked) Level 2 charging port and up to $144,148 to install a (networked) DC Fast charging port in California.[106] Multiplying these costs by the required number of EV charging ports yields the costs summarized in Table 31. These costs, however, are conservative in that they do not include potential incentives

---

[105] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. EVI-X Toolbox. Accessed July 15, 2025, at: https://afdc.energy.gov/evi-x-toolbox#/evi-pro-ports

[106] United States Department of Transportation. November 23, 2020. The Estimated Average Cost to Install Chargers and Outlets for Level 2 Electric Vehicle Charging for a Single-Family House is $1,400. Accessed July 15, 2025, at: https://www.itskrs.its.dot.gov/2020-sc00472

available through CALeVIP which will lower costs. Likewise, they do not consider cost savings from economies of scale (i.e., installing more than one port per charging pedestal and more than one charger per site) which would lower hardware and installation unit costs.[107]

Table 31 Measure TM-4 Cost Summary

Variable	Units	2030 Level 2	2030 DC Fast	2045 Level 2	2045 DC Fast
New EV Charging Port Installations Needed	Charging ports	5,082		20,720	
Level 2 and DC Fast Share of EV Charging Ports[1]	Percentage	94%	6%	94%	6%
New Level 2 and DC Fast EV Charging Port Installations Needed	Charging ports	4,769	313	19,443	1,277
Cost per EV Charger Port[2]	Dollars/charging ports	$7,275	$144,148	$7,275	$144,148
Total Costs	**Dollars**	**$34,691,874**	**$45,174,301**	**$106,752,392[3]**	**$139,008,481[3]**

Note: EV = electric vehicle. Totals may not add up due to rounding.

1. Calculated from the EVI-Pro Lite Tool's outputs for Ventura County. Accessed July 15, 2025, at: https://afdc.energy.gov/evi-x-toolbox#/evi-pro-ports?region_type=cbsa&charging-state=CA&cbsa-id=37100&vehicles=228420.

2. United States Department of Transportation. November 23, 2020. The Estimated Average Cost to Install Chargers and Outlets for Level 2 Electric Vehicle Charging for a Single-Family House is $1,400. Accessed July 15, 2025, at: https://www.itskrs.its.dot.gov/2020-sc00472

3. 2030 total costs are subtracted from 2045 total costs to show the additional total costs needed by 2045.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the passenger ZEV goals established by Measure TM-4.

Action ID	Action Description	Phase	Pillars
TM-4.1	Develop a template ordinance that each jurisdiction can individually adopt to promote Electric Vehicle (EV) chargers in new development, redevelopment, and existing parking spaces. This could include requiring: • Non-Residential – CalGreen Tier 2 provisions • 10 percent of parking spaces in urbanized areas as EV charging spaces • Employers with over 25 employees designating preferred parking spaces for ZEVs or hybrids only • New private parking lots grant ZEVs access to preferred parking spaces. *Until 2030 extend preferred parking space eligibility to hybrid vehicles* • Larger residential rental building owners (more than 15 tenants) and large commercial building owners (more than 10,000 square feet) install working EV chargers in 10% of parking spaces for new and existing buildings at time of renovation if projects are valued at $1,000,000 or greater	1-2	SC
TM-4.2	Issue a regional Request for Proposals (RFP) to select preferred charging station providers and installers, creating a streamlined procurement process that local	1-2	SC

---

[107] CALeVIP. Fast Charge California Project. Accessed July 15, 2025, at: https://calevip.org/fast-charge-california-project

Action ID	Action Description	Phase	Pillars
	jurisdictions, businesses, and organizations can leverage to accelerate deployment of EV charging infrastructure across the region.		
TM-4.3	Develop a publicly accessible database of EV-ready developments using permit data to identify sites with pre-installed infrastructure. This can accelerate deployment by focusing on low-cost, high-impact locations and should be integrated into local Housing Element updates to support long-term planning.	1	P, F
TM-4.4	Build upon the existing multi-family housing charging infrastructure program to address remaining barriers to installing EV charging infrastructure in new and existing multi-family properties, focusing on permitting, panel capacity, and space constraints. Expand funding efforts to support a broader range of charging solutions, including low-voltage, smart chargers, and shared DC fast chargers tailored to tenant needs. Enhance and complement the current outreach plan by targeting additional multi-family property managers, owners of individual units, and tenants using the existing database of the largest complexes, providing continued education on the benefits and opportunities of EV charging infrastructure without duplicating ongoing efforts. Additionally, work with property management organizations to identify an opportunity to pilot an EV car share program.	2	Eq, SC
TM-4.5	Build from the analysis completed as part of the Ventura County EV Ready Blueprint[108] and prepare an updated analysis as part of the Blueprint 3.0. As part of this, evaluate opportunities for curbside street level II chargers in residential areas where off-street parking is limited to provide access to at-home chargers. Additionally, evaluate opportunities for medium- and heavy-duty and regional e-bike chargers.	1	F
TM-4.6	Leverage federal, state, and regional funding sources such as clean transportation grants (e.g., Clean Transportation Program from the California Energy Commission; multiple programs from the California Air Resources Board) to expand public charging infrastructure, especially in priority communities and rural communities.	1-3	$
TM-4.7	Develop outreach and education materials and distribute them to local businesses, property owners, car dealerships, and developers on the financial (e.g., new funding streams), environmental, health, and safety benefits of providing charging infrastructure and what options are available. Provide EV charging installation "best practice" guides and information on streamlined permitting processes. Participate in car shows and ride and drive events. Deploy the program in partnership with local community organizations and trusted community leaders— explore funding mechanisms for funding an EV coach for outreach.	1-2	Ed, P
TM-4.8	Work with California Vanpool Authority and the Ventura County Resource Management Agency to identify opportunities to replace existing vans that are part of the farmworker vanpool program with new, electric vehicles. Support farmers that utilize the program to apply for electric vehicle charging infrastructure grants if they provide charging capacity for the vans. The chargers could provide dual-purposes and could charge the vanpool vans and any other vehicles or equipment that the farm may use to operate.	2	P

---

[108] https://www.vcenergy.org/services/transportation-electrification/electric-vehicle-blueprint/

Measure TM-5: Increase commercial zero-emission vehicle (ZEV) sales and adoption to 20% by 2030 and 100% by 2045 by expanding the EV charging infrastructure across the MSA.

Measure Description

This measure supports the transition of commercial and industrial fleets to zero-emission vehicles by prioritizing infrastructure investments, technical assistance, and workforce development. Building on SCAG's Southern California Zero-Emission Truck Infrastructure Study, the MSA will identify and plan for truck charging and fueling stations in key locations such as commercial corridors, industrial zones, and goods movement hubs. A regional working group will be established to explore cooperative purchasing models for commercial ZEVs and to coordinate pilot projects and funding opportunities.

To support adoption, the MSA will conduct a regional fleet inventory to identify vehicles subject to the Advanced Clean Fleets rule and engage additional businesses in voluntary fleet electrification. Utilities like SCE and CPA will provide technical guidance on grid connection and capacity upgrades to support charging infrastructure. Local fleet operators will be connected with programs like Charge Ready and available state incentives, such as the Clean Truck and Bus Voucher and Low Carbon Fuel Standard (LCFS) credits.

Workforce development will be a key part of implementation. The MSA will collaborate with local colleges/universities and training providers to prepare a workforce capable of supporting ZEV deployment, offering programs focused on ZEV maintenance, charging installation, and fleet operations. Outreach will also target priority communities where freight and delivery traffic are concentrated, helping to advance cleaner air and economic opportunity in areas most impacted by diesel emissions.

The following table summarizes the key descriptive information for the measure.

Table 32 Measure TM-5 Summary

Increase commercial zero-emission vehicle (ZEV) sales and adoption to 20% by 2030 and 100% by 2045 by expanding the EV charging infrastructure across the MSA.	
GHG Emissions Reduction (2030)	65,330 MT CO$_2$e
GHG Emissions Reduction (2045)	505,647 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	2,19,20,21,22,24
Metrics for Progress Tracking	**2030 Metric** ▪ 20% commercial ZEV population **2045 Metric** ▪ 100% commercial ZEV population
Applicable EPA Sector(s)	Transportation

Cost Discussion

Achieving this measure will require commercial vehicle owners to transition from internal combustion engine vehicles to ZEVs. According to CARB, this transition can be costly for commercial

vehicles with the largest commercial ZEV powertrains (i.e., Class 8 vehicles) costing on average $279,937 more than their conventional counterparts.[109] While transitioning smaller commercial vehicles to ZEVs will cost less, using the cost difference for Class 8 vehicles represents the maximum incremental costs which could be covered through incentives. This cost per commercial vehicle can be applied to the number of commercial ZEVs expected for each year to estimate total costs. Department of Motor Vehicle truck counts[110] are compared to VMT for the inventory year, to estimate commercial vehicles per VMT in the MSA. This ratio is applied to the forecasted MSA VMT for 2030 and 2045 to estimate total commercial vehicle population and multiplied by the measure's ZEV share goals (i.e., 20 percent for 2030 and 100 percent for 2045) to estimate the commercial ZEV population for 2030 and 2045. To understand implementation costs for the measure, the number of commercial ZEVs is compared to the baseline commercial ZEVs. Applying costs to these additional commercial ZEVs yields maximum costs of $5,821,258,018 and an additional $28,807,218,318 needed to transition commercial vehicles to ZEVs in 2030 and 2045, respectively. These costs are expected to be offset by State incentives and do not include costs for commercial charging infrastructure. Additionally, investments in charging infrastructure will be needed to support these commercial ZEVs. DC Fast chargers, which are well-suited for commercial EV charging, cost $28,401 to $140,000 per unit.[111]

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the commercial ZEV goals established by Measure TM-5.

Action ID	Action Description	Phase	Pillars
TM-5.1	Leverage the findings and regional blueprint from SCAG's Southern California Zero-Emission Truck Infrastructure Study to prioritize, plan, and coordinate deployment of zero-emission truck charging and fueling stations within the MSA, especially those located near commercial corridors, industrial zones, and transportation hubs. Focus on aligning infrastructure investments with local market needs, identifying pilot locations, securing funding, and supporting integration with broader regional and state zero-emission transportation goals.	1	F, Pr
TM-5.2	Build on the region's existing biodiesel purchasing cooperative by establishing a regional working group composed of commercial vehicle owners, operators, sellers, MSA representatives, and charging/hydrogen hub providers. This group will explore creating a cooperative purchasing model to leverage collective buying power for commercial ZEV fleets, identify regional needs and challenges, develop pilot projects, and coordinate funding opportunities to accelerate fleet electrification across the MSA.	1-2	P, SC
TM-5.3	Conduct a comprehensive inventory of medium- and heavy-duty (MHD) vehicle fleets across the MSA to identify operators that were previously subject to the Advanced Clean Fleets (ACF) regulation and assess the potential for voluntary ZEV adoption, with particular emphasis on fleets operating in priority communities. Evaluate opportunities for developing multi-use ZEV charging hubs capable of serving a range of vehicle types, including box trucks, long-haul freight vehicles,	1	F, Pr

---

[109] California Air Resources Board (CARB). 2024. Zero-Emission Class 8 Truck Pricing Comparisons – EU & US. Accessed July 15, 2025, at: https://ww2.arb.ca.gov/sites/default/files/2024-12/Zero%20Emission%20Class%208%20Tractor%20Pricing%20Comparisons_ADA.pdf

[110] State of California Department of Motor Vehicles. Vehicles Registered by County. Accessed July 15, 2025, at: https://www.dmv.ca.gov/portal/dmv-research-reports/research-development-data-dashboards/vehicles-registered-by-county/.

[111] United States Department of Transportation. November 23, 2020. The Estimated Average Cost to Install Chargers and Outlets for Level 2 Electric Vehicle Charging for a Single-Family House is $1,400. Accessed July 15, 2025, at: https://www.itskrs.its.dot.gov/2020-sc00472

Action ID	Action Description	Phase	Pillars
	and school buses to increase infrastructure utilization rates and improve the business case for private-sector investment. Conduct a technical and financial assessment to model projected charging demand and evaluate whether capital investments in charging infrastructure are economically viable.		
TM-5.4	Explore partnerships with electric utility providers in the MSA (e.g., SCE, CPA) to provide additional technical advice to commercial entities on grid connection, network installation, supply, transmission, distribution, analysis, and required upgrades to support the deployment of EV charging infrastructure, ensure grid reliability, and facilitate compliance with local and state electrification goals.	1-2	P
TM-5.5	Engage with local employers and business fleet owners in the region to identify opportunities for accelerated fleet conversion to ZEV/EV and support infrastructure planning. Coordinate with SCE and provide identified fleet operators with technical support to apply to the Charge Ready program.	1-2	Ed, $
TM-5.6	Collaborate with the County's Workforce Development Board, local fleet operators (e.g., the Port of Hueneme), and colleges (e.g., the Ventura County Community College District [VCCCD], California State University, Channel Islands [CSUCI], California Lutheran University [CLU]) to develop a comprehensive training program, including hosting workforce development trainings to discuss the benefits and technical requirements of ZEV fleets and supporting infrastructure. In addition to retraining the existing workforce, advertise and promote opportunities in the area to attract additional workforce support such as ZEV technicians and mechanics, and charging and fueling technicians.	1-3	Ed, P
TM-5.7	Partner with interested parties in the industry to develop and implement a comprehensive program that provides financial incentives, technical assistance, infrastructure support, education and outreach, and partnerships to promote the adoption of ZEVs by commercial entities	1-3	P

Measure TM-6: Electrify or otherwise decarbonize 60% of SORE equipment and replace conventional diesel consumption with renewable diesel in 70% of applicable large diesel equipment by 2030 in alignment with EO N-79-20.

Measure Description

This measure supports the transition of off-road equipment such as that used in construction, landscaping, agriculture, ports, and industrial operations to cleaner technologies through electrification and renewable diesel adoption. Outreach led by regional chambers of commerce and VCAPCD will promote awareness of Executive Order N-79-20 and available incentive programs to businesses and equipment operators. Public demonstrations and case studies of electric and renewable-fueled equipment, such as Ventura County's solar-powered harvester, will increase visibility of viable alternatives.

A regional decarbonization study will analyze CARB's DOORS data to segment fleets by fuel type, usage patterns, and infrastructure availability, guiding tailored transition timelines. The MSA will enforce existing state regulations requiring renewable diesel use in certain fleets, supported by outreach and partnerships with local fuel suppliers. Interested parties including cities, utilities, the Port of Hueneme, and the U.S. Navy will be convened to coordinate charging and fueling infrastructure in key locations such as construction yards, harbors, and truck stops.

To accelerate adoption, the measure includes demonstration projects for heavy-duty equipment powered by renewable fuels, residential trade-in events for small gas-powered tools, and a financial assistance program for small businesses serving priority communities. Workforce development

efforts will provide training and reskilling programs in areas most impacted by diesel pollution, supporting fair access to emerging clean equipment jobs.

The following table summarizes the key descriptive information for the measure.

Table 33 Measure TM-6 Summary

Electrify or otherwise decarbonize 60% of SORE equipment and replace conventional diesel consumption with renewable diesel in 70% of applicable large diesel equipment by 2030 in alignment with EO N-79-20.	
GHG Emissions Reduction (2030)	185,974 MT CO$_2$e
GHG Emissions Reduction (2045)	481,249 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	2,19,21,22,24,25
Metrics for Progress Tracking	**2030 Metrics** ▪ 60% of SORE decarbonized ▪ 70% of diesel replaced with renewable diesel ▪ 6,634,717 gallons of off-road fuel avoided from SORE ▪ 16,276,358 gallons of conventional diesel replaced with renewable diesel **2045 Metrics** ▪ 100% of SORE decarbonized ▪ 100% of diesel replaced with renewable diesel ▪ 48,142,314 gallons of off-road fuel avoided from SORE
Applicable EPA Sector(s)	Transportation

Cost Discussion

Electric small off-road engines (SORE) such as lawn mowers, leaf blowers, chainsaws, and trimmers are becoming increasingly available as manufacturers respond to California's zero-emission requirements under Executive Order N-79-20 and AB 1346. Although electric models generally have higher upfront costs, fuel and maintenance savings often make them more cost-effective over time.

To support the transition, the California CORE (Clean Off-Road Equipment) Program offers point-of-sale discounts for eligible electric equipment. For example, a commercial-grade electric chainsaw with battery and charger may cost $500, but CORE provides a $300 voucher.[112] Other eligible equipment includes electric leaf blowers, hedge trimmers, and ride-on mowers.

For large diesel off-road equipment where electric options are limited, switching to renewable diesel can significantly reduce emissions without requiring equipment modifications. Supported by California's LCFS program, renewable diesel is a cleaner, drop-in alternative that helps decarbonize heavy-duty operations and is generally comparable in price to conventional diesel.[113]

---

[112] California Core. 48TH12 12" Top-Handle Chainsaw with Battery & Charger. Accessed July 11, 2025, at: https://californiacore.org/equipment/48th12-12-top-handle-chainsaw-with-battery-charger/

[113] U.S. Department of Energy. Office of Energy Efficiency and Renewable Energy. Fuel Prices. Accessed July 11, 2025, at: https://afdc.energy.gov/fuels/prices.html

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the off-road equipment decarbonization goals established by Measure TM-6.

Action ID	Action Description	Phase	Pillars
TM-6.1	Partner with regional chambers of commerce and the Ventura County Air Pollution Control District (VCAPCD) to disseminate information regarding Executive Order N-79-20 to policymakers and impacted businesses (e.g., lawn equipment dealers, commercial landscapers, construction companies). Use these opportunities to promote transition of equipment sales and equipment use to electric alternatives through existing grants, incentive programs, and equipment expos. Promote pilot projects by providing community demonstrations either in person or via video recording of new equipment, such as autonomous, solar-powered harvesters[114] funded by VCAPCD, to increase awareness of innovative solutions.	1	P, Ed, $
TM-6.2	Leverage California Air Resource Board's (CARB) Off-Road Diesel Online Reporting System (DOORS) database as a foundation to conduct a broader decarbonization feasibility study, segmenting fleets by fuel use, operational needs, geography, and available infrastructure. Once the data has been reviewed and analyzed, identify which fleets are best positioned for electrification versus renewable diesel and create transition timelines based on technical and economic readiness.	1	F
TM-6.3	Enforce CARB's *In-Use Off-Road Diesel-Fueled Fleets Regulation* and the *Commercial Harbor Craft Regulation,* requiring that diesel vehicles over 25 horsepower procure and only use R99 or R100 renewable diesel. This should include developing an outreach strategy to notify fleets subject to the regulation, establishing a means to track compliance, and developing partnerships with fuel suppliers in the region to promote and support the increased procurement of renewable diesel in the region.	1-3	SC, Ed
TM-6.4	Convene VCAPCD, cities, fuel suppliers, equipment distributors, the Port of Hueneme, utilities, and large fleet operators to coordinate renewable diesel supply and electric charging/fueling infrastructure buildout. Focus on supply chain nodes—construction yards, harbors, truck stops, and processing facilities—and explore opportunities with the U.S. Navy and long-term capital investors.	2-3	SC, P
TM-6.5	Develop a multi-party demonstration project to support the transition of heavy-duty off-road and industrial equipment—such as at the Port of Hueneme, aggregate operations, or large-scale construction sites—using locally generated renewable fuels like green hydrogen, renewable diesel, or renewable methanol. Partner with industrial operators, the U.S. Navy, VCAPCD, and renewable fuel developers to site, design, and evaluate the project. Identify a high-visibility location such as the Channel Islands Harbor, the Navy base, or a construction logistics yard.	2-3	SC, F
TM-6.6	Work with electric off-road equipment manufacturers and distributors to host large-scale community residential trade-in events to accelerate the replacement of gas-powered equipment, reduce local air and noise pollution, and increase public awareness of clean technology alternatives.	1-2	P
TM-6.7	Establish a targeted financial assistance program to reduce the burden of off-road equipment electrification or renewable diesel transition for small businesses and operators located in or serving priority communities. This can include technical assistance and multilingual support to help small businesses access funding programs, navigate paperwork, and stay compliant with CARB and local air district regulations.	1-3	$, Pr

---

[114] Ventura County Air Pollution Control District. September 23, 2024. Air District to Fund Solar-Powered Harvest Aids. Accessed July 24, 2025, at: https://www.vcapcd.org/air-district-to-fund-solar-powered-harvest-aids/

Action ID	Action Description	Phase	Pillars
TM-6.8	Partner with workforce development organizations and CBOs to create job training and equipment operator transition programs in priority communities most impacted by diesel pollution.	1-2	P

4.5 Waste Management

Based on the 2022 emissions inventory, solid waste accounted for six percent (360,772 MT CO_2e) of the emissions in the MSA. In California, emissions reduction in the waste sector are largely driven by Senate Bill (SB) 1383, which requires all jurisdictions in the state to reduce organic waste disposal by 75 percent and increase edible food recovery by 20 percent relative to 2014 levels by 2025. SB 1383 also mandates that each jurisdiction procure a specific quantity of recovered organic products (e.g., compost, mulch, or renewable gas) annually, based on population. When organic materials like food scraps and yard waste are sent to landfills, as they decompose they emit methane, a climate super pollutant 28 times more potent than carbon dioxide.[115,116] Landfills are currently the third-largest source of methane emissions in California and also release harmful air pollutants such as fine particulate matter ($PM_{2.5}$), which are associated with significant public health risks.[117] While California's goals are ambitious, many jurisdictions across the state continue to face challenges in achieving organic waste diversion targets, due to limited composting infrastructure and low public participation rates. In the MSA, facility development has been prioritized to meet future demand, with infrastructure currently available at the Oxnard Mountain View facility and additional capacity expected from the Limoneira Compost Facility.

To meet these state requirements and realize the climate and community benefits of organics diversion, Measures SW-1 and SW-2 promote a coordinated, regional approach to waste reduction, methane mitigation, and increased food recovery. Measure SW-1 focuses on improving source separation, redesigning waste collection systems for multi-family and commercial sites, and piloting initiatives like four-bin collection and public waste stations. It also emphasizes multilingual education, community-based outreach, and the launch of a Zero Waste Ambassador Program. Measure SW-2 complements these efforts by enhancing edible food recovery systems, expanding cold storage infrastructure, and aligning operations with SB 1383 reporting needs. Together, these measures aim to reduce contamination, improve compliance, and deliver long-term emissions reduction while building local capacity.

Local solutions that reduce long-haul waste transport and manage organics regionally will also reduce vehicle miles traveled (VMT), support high-road job creation, and offer scalable models for other communities. Siting new infrastructure in alignment with land use constraints—such as those created by Ventura County's Save Open Space and Agricultural Resources (SOAR) initiative—will require creative partnerships, adaptive reuse of existing industrial land, and sustained investment in local capacity.[118] The measures in this sector are designed to work within these constraints while demonstrating that a decentralized, community-driven approach to waste management can meet

---

[115] UN Environment Programme. Climate & Clean Air Coalition to Reduce Short-Lived Climate Pollutants. 2024. Super Pollutants. Accessed June 27, 2025, at: https://www.ccacoalition.org/news/super-pollutants

[116] International Energy Agency. 2021. Methane and climate change. Accessed July 8, 2025, at: https://www.iea.org/reports/methane-tracker-2021/methane-and-climate-change

[117] CalRecycle. 2024. California's Short-Lived Climate Pollutant Reduction Strategy. Accessed July 8, 2025, at: https://calrecycle.ca.gov/organics/slcp/

[118] Save Open Space and Agricultural Resources (SOAR). 2018. What is SOAR? Accessed June 17, 2025, at: https://soarvc.org/about/what-is-soar/

state climate mandates, support environmental justice goals, and help build a circular economy grounded in regional self-sufficiency.

Measure SW-1: Expand and optimize source-separated collection systems to reduce contamination and improve diversion outcomes to reduce organic waste to landfill 75% by 2030 compared to 2014 levels (part of SB 1383 mandates) and to implement other mandated collection systems per AB 939 and AB 341.

Measure Description

This measure focuses on improving organics diversion and reducing landfill-bound waste through regionally consistent waste sorting systems and public education. A model franchise agreement addendum and template ordinance will be developed to require hauler-led outreach and design standards for new multi-family and commercial developments, supporting better bin access and compliance. Site-specific assessments will help property owners and managers retrofit existing developments to improve sorting and container management.

Pilot programs, including a four-bin collection system and a Zero Waste Ambassador Program, will be deployed in target neighborhoods with high contamination rates. These pilots will be informed by route audits and implemented in collaboration with haulers and community-based organizations. Outreach will be conducted in multiple languages and tailored to local needs through school events, Homeowners Association (HOA) meetings, and bin-sorting demonstrations.

Regional consistency will be promoted through shared educational materials, QR-coded bin tags, and follow-up strategies such as multilingual sorting guides and enforcement pathways for persistent noncompliance. CalRecycle and SB 1383 funding opportunities will be pursued to support new organics equipment and outreach efforts. The measure emphasizes a collaborative approach among haulers, jurisdictions, and community partners to reduce contamination, increase participation, and meet state diversion goals.

The following table summarizes the key descriptive information for the measure.

Table 34 Measure SW-1 Summary

Expand and optimize source-separated collection systems to reduce contamination and improve diversion outcomes to reduce organic waste to landfill 75% by 2030 compared to 2014 levels (part of SB 1383 mandates) and to implement other mandated collection systems per AB 939 and AB 341.	
GHG Emissions Reduction (2030)	281,544 MT CO$_2$e
GHG Emissions Reduction (2045)	369,059 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	18
Metrics for Progress Tracking	**2030 Metrics** ▪ 516,477 tons of organic waste diverted annually ▪ 247,675 tons of organic waste composted annually ▪ 75% organics diversion rate **2045 Metrics** ▪ 694,244 tons of organic waste diverted annually ▪ 332,923 tons of organic waste composted annually ▪ 100% organics diversion rate
Applicable EPA Sector(s)	Solid Waste and Waste Generation

Cost Discussion

Achieving Measure SW-1's goal to reduce landfilled organic waste will be accomplished through various methods. According to CalRecycle's 2014 Waste Characterization Study, about 35 percent of the MSA's landfilled waste is organic waste that can be composted.[119] This data means a large share of the diversion efforts will involve diverting organic waste to composting facilities. On average, it costs about $120 to transport and compost one ton of organic waste.[120] In comparison, the average landfill tipping fee in California is about $45 per ton.[121] Although this excludes the cost to transport waste to the landfill due to data availability limitations, this data indicates that it costs up to $75 more to compost a ton of waste rather than landfill it. Applying this cost difference to the targeted annual tonnage of composted organic waste and multiplying by the applicable number of implementation years yields the costs summarized in Table 35. The remaining organic waste (i.e., non-compostable organic waste including paper, and construction and demolition waste) will need to be diverted through existing recycling efforts.

---

[119] CalRecycle. Business Group Waste Stream by Material Type. Accessed July 10, 2025, at: https://www2.calrecycle.ca.gov/WasteCharacterization/MaterialTypeStreams?lg=1035&cy=35#

[120] Power Knot. June 3, 2024. The Costs for Commercial Food Recycling in California. Accessed July 10, 2025, at: https://powerknot.com/2024/06/03/the-costs-for-commercial-food-recycling-in-california/#:~:text=Composting%20is%20well%2Dsuited%20for,food%20waste%20is%20approximately%20$120

[121] CalRecycle. February 2015. Landfill Tipping Fees in California. Accessed July 10, 2025, at: https://www2.calrecycle.ca.gov/Publications/Download/1145#:~:text=Results-,Posted%20Landfill%20Tipping%20Fees%20for%20Municipal%20Solid%20Waste%20(MSW),tendency%20of%20this%20data%20set

Table 35 Measure SW-1 Cost Summary

Variable	Units	2030	2045
Annual Waste per Capita[1]	Tons/service person	0.766	0.766
Service population (population + employees)	People serviced	1,228,000	1,238,000
Annual Total Waste	Tons	941,075	948,738
Compostable Waste Share[2]	Percentage	35%	35%
Annual Total Compostable Waste	Tons	330,234	332,923
Measure SW-1's Annual Diversion Target	Percentage	75%	100%
Annual Target Organic Waste Diverted to Composting	Tons	247,675	332,923
Cost Difference of Composting[3]	Dollars/ ton	$75	$75
Implementation Years	Years	5	15
Total Costs	**Dollars**	**$92,878,249**	**$374,538,345**

Notes:

1. Calculated from the 2022 GHG Inventory. See Appendix A Greenhouse Gas Inventory Analysis Report for more details.

2. Calculated from CalRecycle's 2014 Waste Characterization Study for Ventura County. Includes food, leaves and grass, prunings and trimmings, branches and stumps, manure, and composite organics in share. Accessed July 10, 2025, at: https://www2.calrecycle.ca.gov/WasteCharacterization/MaterialTypeStreams

3. Calculated as $120/ton (average cost to transport one ton of food waste) minus $45/ton (average landfill tipping fee). Accessed July 10, 2025, at: https://powerknot.com/2024/06/03/the-costs-for-commercial-food-recycling-in-california/#:~:text=Composting%20is%20well%2Dsuited%20for,food%20waste%20is%20approximately%20$120 https://www2.calrecycle.ca.gov/Publications/Download/1145#:~:text=Results-,Posted%20Landfill%20Tipping%20Fees%20for%20Municipal%20Solid%20Waste%20(MSW),tendency%20of%20this%20data%20set

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the organic waste diversion goals established by Measure SW-1.

Action ID	Action Description	Phase	Pillars
SW-1.1	Develop a program for property owners and management companies of existing multi-family and commercial developments in the MSA to complete site-specific assessments (e.g., to understand capacity) and identify opportunities for increased access and compliance.	1	F
SW-1.2	Develop a template ordinance that each jurisdiction can individually adopt that requires new multi-family and commercial projects to provide dedicated space for a multi-bin system, which would at a minimum include space for three bins (trash, recycling, and organics collection). Create a Design Guide with sample site designs, dimensions, and best practices to streamline integration into new projects and support jurisdictional plan checks.	2	SC
SW-1.3	Use existing route audits and contamination tracking to identify target neighborhoods and expand the program based on the results of the pilot.	1-2	F
SW-1.4	Repair and improve the existing network of centralized public waste collection stations collocated with public transit stops. In cases where ongoing costs of collection can be covered from new funding sources, expand the program to mobility hubs, and EV charging infrastructure—particularly in or near high-density and multi-family areas where on-site waste collection is limited due to space or funding constraints. These	1-2	F

Action ID	Action Description	Phase	Pillars
	facilities will include clearly marked, distributed containers for recycling, landfill, and organics.		
SW-1.5	Establish a Collaborative Working Group of jurisdiction representatives to develop regionally consistent guidelines on education for waste management and share information with each other. As part of this working group, invite EJ Harrison & Sons, Athens Services, Waste Management, and the cities of Port Hueneme and the City of Oxnard, which serve as their own waste haulers, to support the development of hauler-specific follow-up education and potential regional standards for enforcement pathways (e.g., HOA meetings, fines for repeat noncompliance) when bin contamination is discovered. Explore the use of bin tags with QR codes linking to multilingual sorting guides and other succinct educational material during route reviews.	1-2	P
SW-1.6	Work with local community-based organizations (CBOs) and the Ventura County Office of Education to co-create and deliver culturally relevant, multilingual science-based materials tailored to pilot neighborhoods. Conduct in-person bin-sorting demonstrations at public events, such as HOA meetings, school events, and community education meetings, to identify organics, recyclables, and waste streams, as well as common prohibited materials and household hazardous wastes (HHW). Teach proper sorting for recycling, and teach exclusion methods and safe substitutes for HHW.	1-2	Ed, Pr
SW-1.7	Pursue joint funding opportunities in collaboration with EJ Harrison & Sons, Athens Services, Waste Management, and the Cities of Port Hueneme and Oxnard – apply for CalRecycle grants, SB 1383, and new and innovative funding sources to support new equipment (e.g., organics collection vehicles, processing technology), standardized public education campaigns, and pilot programs that reduce contamination in organics bins.	1-3	$
SW-1.8	Launch an MSA-wide Zero Waste Ambassador Program to engage community members in reducing contamination and increasing participation in organics diversion, with a focus on multi-family buildings. Build on existing local initiatives by recruiting volunteers through schools, neighborhood groups, and CBOs. Provide ambassadors with consistent training, co-developed with haulers and city staff, and supply multilingual outreach materials to support door-to-door engagement and event tabling in high priority areas.	2-3	Ed, Pr

Measure SW-2: Expand regional food recovery by sharing resources, improving transportation and storage systems, and enabling the rescue and distribution of edible food.

Measure Description

This measure aims to reduce food waste and enhance food security by strengthening regional food recovery systems. A coordinated program will be developed to support SB 1383 compliance, establish shared collection and redistribution protocols, and deploy standardized tracking tools. Regular meetings with food recovery organizations, waste haulers, and local jurisdictions will clarify roles, improve data consistency, and streamline operations across the MSA.

To support fair distribution, the MSA will inventory cold storage assets including at schools, churches, and community kitchens to identify shared capacity and infrastructure gaps. Targeted support will be provided to grassroots-led redistribution sites, especially in priority communities, through technical assistance on food safety and site operations. Amendments to local zoning codes will help make new food service facilities "recovery ready" by requiring space for cold storage and loading zones.

Public education and school-based programming will play a key role in growing community participation. Partnerships with school districts will support food share tables, backpack programs,

and student-led waste reduction campaigns. Outreach materials and media campaigns will share local success stories and promote food donation across businesses, institutions, and residents, helping to build a culture of food recovery throughout the MSA.

The following table summarizes the key descriptive information for the measure.

Table 36 Measure SW-2 Summary

Expand regional food recovery by sharing resources, improving transportation and storage systems, and enabling the rescue and distribution of edible food.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	18
Metrics for Progress Tracking	▪ Tons of edible food or number of meals recovered
Applicable EPA Sector(s)	Solid Waste and Waste Generation

Cost Discussion

Implementing a coordinated regional food recovery program will require investments in staffing, infrastructure, technology, and ongoing operations. Initial funding will support program coordination, interested party engagement, and development of standardized tracking systems aligned with SB 1383 reporting requirements. Costs will include cold storage equipment, refrigerated transport, and upgrades to existing or new regional food recovery centers. To provide consistent data tracking and reporting, the program will deploy platforms such as Careit, with associated training and software expenses.

Ongoing operational costs will include staffing for logistics and food handling, fuel and maintenance for vehicles, and grants or contracts with community-based organizations that support food redistribution. Total program costs will vary based on regional scale and participation but can be offset through CalRecycle's SB 1383 Local Assistance Grant Program,[122] USDA food systems grants,[123] and potential public-private partnerships. In one regional example, a food recovery program launched with a first-year budget of approximately $761,000, with individual jurisdictions contributing as little as $17,000 by pooling resources and funding sources across participating cities.[124] Shared infrastructure and centralized tracking are expected to reduce redundancy, improve cost-efficiency, and enhance the program's ability to meet food recovery and organic waste diversion goals.

---

[122] CalRecycle. SB 1383 Local Assistance Grant Program. Accessed July 18, 2025, at: https://calrecycle.ca.gov/organics/slcp/owrlocalassistancegrant/

[123] USDA National Institute of Food and Agriculture. Community Food Projects Competitive Grant Program. Accessed July 18, 2025, at: https://www.nifa.usda.gov/grants/programs/hunger-food-security-programs/community-food-projects-competitive-grant-program-cfpcgp

[124] Cool Davis. October 19, 2021. California Senate Bill 1383: Edible Food Recovery. Accessed July 18, 2025, at: https://www.cooldavis.org/2021/10/19/california-senate-bill-1383-edible-food-recovery

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the regional food recovery goals established by Measure SW-2.

Action ID	Action Description	Phase	Pillars
SW-2.1	Continue development of Waste Free VC, a coordinated regional food recovery program that supports city-level SB 1383 reporting responsibilities by establishing a shared framework for food collection, redistribution, and data tracking. Continue convening regular coordination meetings with entities such as waste haulers, Abound Food Care, Food Share of Ventura County, Food Forward, Ventura County Food Pantry, and local food generators to formalize roles, assess infrastructure and storage capacity, and streamline operations. Expand efforts to collaborate with cities and CBOs to co-develop regional food recovery centers and deploy standardized tracking tools—such as Careit—to provide consistent metrics, avoid duplication of effort, and align with CalRecycle guidance.	1	P, SC
SW-2.2	Expand existing efforts to map cold storage assets across the MSA—including schools, churches, food banks, and commercial kitchens—with input from community partners, local jurisdictions, and food recovery organizations. Use this inventory to identify underutilized or shared cold storage capacity and assess gaps in high-need areas. Partner with organizations like Ventura County Public Health and Food Forward to explore opportunities for shared access agreements and low-cost retrofits that expand storage availability for short-term food rescue, prioritizing locations in priority communities with limited infrastructure.	1	F
SW-2.3	Follow up on Abound survey to identify and support additional grassroots-led food redistribution sites across the MSA, with a focus on priority communities. Use existing County staff or CBO partners to help identify sites with refrigeration, like community centers or CBOs, that could serve as informal food hubs. Leverage existing platforms, such as 211 Ventura County, to support home food deliveries in times of need or when residents cannot leave their homes.	1-2	Pr, Ed
SW-2.4	Expand work with the local school districts including Superintendents, Boards of Education, Assistant Superintendents, and District Sustainability Coordinators or Facilities Managers, to provide assurance that food donation programs comply with the legal requirements and support community wellbeing. Implement additional programs in Districts that have approved the initiative and work to overcome the objections of those that have not approved all related initiatives. Partner with local schools to implement programs that reduce food waste in cafeterias and among students by supporting food share tables or a food backpack program,[125] composting initiatives, and student-led waste education campaigns. Collaborate with school nutrition staff to track surplus food and explore donation or redistribution options, while integrating waste reduction principles into the school curriculum.	1-2	P, Ed
SW-2.5	Partner with school districts, churches, and service organizations to amplify local success stories via their newsletters, bulletin boards, and events. Highlight examples of surplus food donations helping neighbors, volunteers in action, and student-led initiatives. Use no-cost media, like Nextdoor and social media pages from trusted community groups to grow support.	1-2	P, Ed
SW-2.6	Utilize existing CalRecycle materials to create MSA-specific outreach and educational materials that provide consistent messaging to engage food donors and recovery partners most effectively. Additionally, increase bookings for "Eco Heroes," currently funded by the County at $25,000 per year, so the organization can provide school assemblies in additional jurisdictions. These presentations deliver fun, engaging	1-2	Ed

---

[125] Food backpack programs offer students, caregivers, and family's free groceries for weekends and school breaks in a discrete backpack.

Action ID	Action Description	Phase	Pillars
	information on waste management, including how to effectively support edible food recovery.		
SW-2.7	Amend local planning or zoning ordinances to encourage or require space for cold storage, loading zones, and donor drop-off access in the design of large grocery stores, food service facilities, or warehouses. This confirms new facilities are "food recovery ready."	2	SC

4.6   Water and Wastewater

In the MSA, combined emissions from water and wastewater account for less than one percent of the total emissions (water use generated 29,622 MT CO_2e and wastewater generation resulted in 9,158 MT CO_2e). AB 1668 and SB 606, both passed in 2018, establish guidelines for water efficiency and conservation and provide a framework for new standard implementation. These bills lay the groundwork for sustainable water management by establishing a framework for efficient water use and drought preparedness. The legislation mandates that urban water suppliers adhere to specific Water Use Objectives (WUOs), which include outdoor residential consumption, commercial and institutional irrigation with dedicated meters, and system water loss. Additionally, the bills encourage water recycling through incentive programs and require both urban and agricultural water providers to develop annual water budgets and drought contingency plans. They also identify vulnerable small and rural water systems, offering guidance to enhance resilience against future water shortages.[126]

The CCAP focuses on reducing water and wastewater emissions through measures that advance regional One Water strategies to reduce water use in adherence with California's WUO and expand regional opportunities for wastewater decarbonization technologies.

Measure WW-1: Advance regional One Water strategies to reduce per capita potable water use in line with California's Water Use Objective (WUO), while increasing the use and integration of alternative water sources (e.g., recycled water, stormwater, groundwater recharge) and renewable energy to build climate resilience and reduce GHG emissions.

Measure Description

This measure supports a shift toward integrated, sustainable water management through the adoption of One Water principles.[127] A regional collaborative will be formed using existing networks to align implementation of California's WUO, coordinate peer exchanges, and co-develop outreach and technical tools for residents, developers, and water agencies. Key initiatives include updated zoning and development guidelines that support water conservation, stormwater reuse, and renewable energy integration.

---

[126] State Water Resources Control Board. California Statutes Making Conservation a California Way of Life. Accessed June 17, 2025, at: https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/california_statutes.html

[127] One Water is an integrated, sustainable approach to water resource management that treats all water, drinking water, wastewater, stormwater, recycled water, and groundwater, as a single, interconnected resource. Rather than managing each source in isolation, One Water planning emphasizes coordination across sectors, maximizing reuse and conservation, and ensuring the right water quality is used for the right purpose. This approach enhances climate resilience, supports long-term water security, and prioritizes fair access for all communities. More information available at: https://uswateralliance.org/about-us/vision-for-a-one-water-future/

A regional assessment will evaluate the technical and financial feasibility of water reuse strategies—such as stormwater capture, groundwater recharge, and recycled water systems—while quantifying energy demand and GHG impacts. This work will be complemented by multilingual, community-driven outreach campaigns focused on smart water use, leak detection, and rebate programs.

The measure emphasizes support for priority communities by expanding access to conservation programs and working with trusted partners to address barriers like language, cost, and awareness. Joint funding proposals will be pursued across jurisdictions to implement integrated water infrastructure and conservation projects, strengthening regional resilience in a changing climate.

The following table summarizes the key descriptive information for the measure.

Table 37 Measure WW-1 Summary

Advance regional One Water strategies to reduce per capita potable water use in line with California's Water Use Objective (WUO), while increasing the use and integration of alternative water sources (e.g., recycled water, stormwater, groundwater recharge) and renewable energy to build climate resilience and reduce GHG emissions.	
GHG Emissions Reduction (2030)	2,728 MT CO_2e
GHG Emissions Reduction (2045)	0 MT CO_2e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	17
Metrics for Progress Tracking	**2030 Metrics** ▪ 19,906,176 kWh reduced from imported water ▪ 15% water use reduction compared to forecast **2045 Metrics** ▪ 20,068,279 kWh reduced from imported water ▪ 15% water use reduction compared to forecast
Applicable EPA Sector(s)	Water

Cost Discussion

Reducing per capita water consumption reduces both the water consumed and the energy required to import the water for community use, providing cost savings in avoided utility bill charges. California established a voluntary 15 percent reduction in water use across suppliers from 2021 - 2023. With the establishment of the 2024 Water Use Objective (WUO) under the state's *"Making Conservation a California Way of Life"* framework,[128] which became effective in 2025, each supplier has a unique WUO that is determined by the sum of several components: calculated standards for residential indoor and outdoor use, commercial outdoor irrigation, and an allowable volume of system water loss. Although the 15 percent reduction is no longer the goal across water suppliers, because there are over 100 water suppliers in Ventura County, a 15 percent reduction is applied to be conservative and provide a standard reference point for cost. The estimated annual imported water use (estimated from forecasted electricity use for imported water and the State Water Project's water energy intensity factor of 1,064 kWh per acre-foot)[129] was to calculate the resulting annual reduction in imported water. The average cost of water from the State Water Project is $846

---

[128] https://www.waterboards.ca.gov/conservation/regs/docs/2024/final-text-conservation-way-of-life.pdf

[129] California Department of Water Resources. Water Energy Nexus. Accessed July 15, 2025, at: https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Water-Energy-Nexus

per acre-foot.[130] Multiplying this cost by the annual water reduced and the implementation years yields the total cost savings for the measure, summarized in Table 38.

Table 38 Measure WW-1 Cost Summary

Variable	Units	2030	2045
Annual electricity used to import water	kWh	19,906,176	20,068,279
Electricity use per acre-foot[1]	kWh/acre-foot	1,064	1,064
Water use reduction	Percentage	15%	15%
Water reduced	Acre-feet	18,709	18,861
Unit Cost[2]	Dollars/acre-foot	($846)	($846)
Implementation years	Years	5	15
Total Costs	**Dollars**	**($79,138,276)**	**($239,348,173)**

Notes: () indicates a negative value or cost savings; kWh = kilowatt-hours.

1. California Department of Water Resources. Water Energy Nexus. Accessed July 15, 2025, at: https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Water-Energy-Nexus
2. California Department of Water Resources. The Economy of the State Water Project. Accessed July 15, 2025, at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/News/Files/SWP-Economics-Brochure_FINAL.pdf

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the water consumption goals established by Measure WW-1.

Action ID	Action Description	Phase	Pillars
WW-1.1	Conduct a regional assessment that quantifies the technical, financial, and environmental feasibility of One Water strategies. Include WUO implementation modeling, water supply projections, energy demand, stormwater potential, and lifecycle GHG impacts of various water reuse technologies powered by renewables.	1	F
WW-1.2	Leverage the existing networks to establish a formal One Water collaborative that includes representatives from water suppliers, sanitation districts, City and County public works departments, CBOs, and energy utilities (e.g., SCE, CPA). The intent of this program would be to support the Making Water Conservation a Way of Life implementation regulation. Use this group to facilitate biannual workshops and targeted peer exchanges where water agencies share performance data, align WUO implementation strategies and One Water efforts, and co-develop regional outreach templates, customer support tools (e.g., leak alerts, smart meter education), and MWELO compliant retrofit resources.	1-2	P
WW-1.3	Develop regional guidelines that incorporate One Water and WUO principles into zoning and development codes. Promote multi-benefit infrastructure that supports conservation, stormwater reuse, and MWELO compliance while requiring renewable energy integration. Share demonstration garden templates and continue to provide resources for tools like smart irrigation controllers and leak detection systems through a centralized platform to support implementation.	2	SC
WW-1.4	Launch a regional outreach campaign for developers, water suppliers and agencies, and residents that highlights the benefits of water conservation and One Water	1-2	Ed

---

[130] California Department of Water Resources. The Economy of the State Water Project. Accessed July 15, 2025, at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/News/Files/SWP-Economics-Brochure_FINAL.pdf

Action ID	Action Description	Phase	Pillars
	practices. Use workshops, utility inserts, digital media, and CBO channels to tailor outreach for diverse audiences, including clear language and multilingual materials for priority communities.		
WW-1.5	Engage priority communities in water planning processes to provide fair access to conservation programs and One Water benefits. Expand distribution of leak detection kits and rebate assistance, and co-develop outreach with trusted partners to address barriers such as cost, language, or technical complexity.	1-2	Pr
WW-1.6	Pursue aligned regional funding through sources like Integrated Regional Water Management grants and Department of Water Resources conservation programs. Coordinate across jurisdictions to support joint proposals for integrated conservation and One Water infrastructure, prioritizing investments that benefit prioritized areas and promote resilience.	1-2	$

Measure WW-2: Expand regional opportunities for implementation of wastewater decarbonization technologies to reduce GHG emissions, manage biosolids more sustainably, and generate renewable energy or fuels.

Measure Description

This measure supports collaboration across wastewater treatment plants (WWTPs) to accelerate decarbonization and renewable energy generation. A dedicated working group of WWTP operators will identify shared priorities, challenges, and opportunities for technologies such as anaerobic digestion, biogas recovery, and co-digestion of organic waste. A regional feasibility assessment will identify sites best positioned for deployment, particularly those with potential to generate biofuels and help meet SB 1383 procurement targets.

To support implementation, jurisdictions will coordinate on joint funding applications, emphasizing projects that reduce GHGs, produce renewable fuels, and generate LCFS credits. Technical assistance and grant-writing support will be prioritized for smaller or under-resourced WWTPs to help support broader participation.

A Regional Innovation Cohort will be established with local operators, research institutions, clean tech startups, and industry experts to pilot emerging technologies such as biosolids-to-energy systems, carbon capture, and low-emission treatment methods. These pilots will help scale up cost-effective solutions and promote accessible, resilient wastewater infrastructure across the MSA.

The following table summarizes the key descriptive information for the measure.

Table 39 Measure WW-2 Summary

Expand regional opportunities for implementation of wastewater decarbonization technologies to reduce GHG emissions, manage biosolids more sustainably, and generate renewable energy or fuels.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	18
Metrics for Progress Tracking	▪ Quantity of GHG emissions reduced ▪ Number of new wastewater decarbonization technologies implemented
Applicable EPA Sector(s)	Wastewater Treatment

Cost Discussion

Implementation of this measure will require upfront investments in planning, coordination, and capital infrastructure. However, several funding mechanisms are available to offset these costs. The MSA will pursue funding sources such as the California Energy Commission and CalRecycle's Organics Grant Program[131] to support feasibility studies, digester installation, and facility upgrades. Additional revenue can be generated through participation in the LCFS program, which awards credits for renewable fuel production. These LCFS credits can then be reinvested to support ongoing implementation.

While initial resources will be needed to establish the regional working group and provide technical assistance, particularly for smaller or under-resourced wastewater treatment plants, these costs are expected to be balanced by the long-term financial and environmental benefits of biogas recovery and co-digestion. Costs for individual projects will vary depending on site-specific factors such as facility size, feedstock availability, and existing infrastructure. Nevertheless, recent analyses indicate many anaerobic digestion and biogas projects yield a favorable return on investment,[132] particularly when co-benefits such as GHG reductions, regulatory compliance (e.g., SB 1383), and renewable fuel generation are considered.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the wastewater decarbonization goals established by Measure WW-2.

---

[131] CalRecycle. Organics Grant Program. Accessed July 17, 2025, at: https://calrecycle.ca.gov/funding/organics/

[132] Verdant. November 17, 2020. 2020 SGIP Biogas Generation Market Assessment and Cost-Effectiveness Report. Accessed July 17, 2025, at: https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/self-generation-incentive-program/2020-sgip-biogas-generation-market-assessment-and-ce-report.pdf

Action ID	Action Description	Phase	Pillars
WW-2.1	Within the regional climate coalition, support the expansion of a working group of wastewater treatment plants (WWTP) operators and managers across the MSA to identify shared priorities, challenges, and opportunities for implementing wastewater decarbonization technologies such as anaerobic digestion and biogas recovery. This working group will include representatives from each facility and meet regularly to coordinate project feasibility, technology compatibility, and funding alignment.	1-2	SC, Ed
WW-2.2	Conduct an MSA-wide feasibility assessment to identify WWTPs with the highest potential for integrating or expanding anaerobic digestion systems. Partner with Ventura County Public Works, sanitation districts, and utilities to evaluate facility readiness, biogas yield potential, and opportunities for co-digestion with food and organic waste to meet SB 1383 procurement targets and develop a local resource for biofuel. Pursue funding and implementation in a coordinated manner based on an agreed prioritization system.	1	F
WW-2.3	Pursue state and federal funding through the California Energy Commission and CalRecycle's Organics Grant Program to finance planning and capital costs for digester installation or upgrades. Package proposals that demonstrate co-benefits such as GHG reduction, renewable fuel generation (e.g., compressed natural gas or hydrogen), and potential LCFS credit revenue.	1-2	$
WW-2.4	Enable balanced participation in wastewater decarbonization efforts by providing targeted technical support, grant-writing assistance, and capacity-building resources to operators of smaller or under-resourced WWTPs—particularly those serving priority communities.	1-2	Pr
WW-2.5	Establish a Regional Innovation Cohort in partnership with local WWTP operators, clean tech startups, research institutions like CSU Channel Islands, and industry associations to pilot emerging wastewater decarbonization technologies. The cohort will serve as a testbed for small-scale demonstrations of biosolids-to-energy systems, carbon capture from digesters, and low-emission treatment methods.	2	P

4.7   Natural and Working Lands

The Land Cover and Carbon Stock Inventory for the MSA provides a comprehensive assessment of the carbon stored in natural and working lands across the region. Spanning more than 1.1 million acres, the inventory establishes a baseline using publicly accessible data sources for the MSA. It categorizes land cover types such as forest, grassland, and wetland, and quantifies the associated carbon stocks by land cover and land ownership, offering critical insight into how various landscapes store GHGs.

The inventory methodology is consistent with State guidance, including California's 2017 Climate Change Scoping Plan and the 2018 Natural and Working Lands Inventory. It was developed in coordination with local County staff to facilitate regional relevance and accuracy. The analysis supports climate planning efforts by quantifying existing carbon stocks and land-based emissions and evaluating how climate-smart land management practices can enhance sequestration and reduce emissions. This inventory serves as a foundational tool for future land use planning and conservation, helping the MSA identify strategies that protect or enhance carbon storage. The findings inform land management decisions, support California's nature-based climate goals under AB 1279 and AB 1757 and contribute to building a more climate-resilient region.

Additional details including datasets, land cover classifications, geographic scope, and quantified GHG emissions reduction are provided in Appendix D Natural Working Lands Report. These findings directly inform the measures outlined in the following section.

Measure NWL-1: Expand and maintain a healthy regional tree canopy and riparian buffers by planting 500 new trees annually through 2045 to boost carbon sequestration, enhance biodiversity, and strengthen resilience to heat and flooding.

Measure Description

Trees and riparian corridors play a critical role in the region's climate resilience, supporting carbon sequestration, cooling neighborhoods, improving air and water quality, and enhancing habitat connectivity. Measure NWL-1 focuses on expanding and maintaining a healthy, accessible regional tree canopy and riparian buffer network by planting 500 new trees annually through 2045. This measure prioritizes nature-based solutions that deliver climate, ecological, and community co-benefits, particularly in areas most vulnerable to extreme heat and flooding.

To guide implementation, this measure outlines a suite of coordinated actions across the MSA, including the use of tools such as the Tree Equity Score, LiDAR imagery, and local GIS data to identify priority planting areas and maximize carbon sequestration potential. It promotes the development of model standards for General Plans and zoning codes, fosters regional collaboration through a formal Tree and Riparian Collaborative, and centers inclusion by targeting underserved communities for restoration efforts. Long-term success will be supported through public education campaigns, multilingual community engagement, and sustained funding for maintenance, stewardship, and workforce development. Together, these actions aim to build a resilient green infrastructure that benefits both people and ecosystems.

The following table summarizes the key descriptive information for the measure.

Table 40 Measure NWL-1 Summary

Expand and maintain a healthy regional tree canopy and riparian buffers by planting 500 new trees annually through 2045 to boost carbon sequestration, enhance biodiversity, and strengthen resilience to heat and flooding.	
GHG Emissions Reduction (2030)	266 MT CO$_2$e
GHG Emissions Reduction (2045)	3,717 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	9,13
Metrics for Progress Tracking	**2030 Metric** ▪ 2,500 trees planted ▪ Tree Equity Score **2045 Metric** ▪ 10,000 trees planted ▪ Tree Equity Score
Applicable EPA Sector(s)	Urban Forestry

Cost Discussion

The emissions reduction from this measure will be primarily achieved by expanding and maintaining the MSA's regional tree canopy through annual tree planting and maintenance. Implementation costs are largely driven by the planting, establishment, and ongoing maintenance of trees. An analysis from a case study on urban forests in Los Angeles estimated the average annual cost of a

public tree to be $71 to $186.[133] These annual costs account for the full lifecycle of a tree, including planting, establishment, maintenance, removal, infrastructure repairs, and administrative expenses. Averaging this cost range yields a unit cost of approximately $111 per public tree. Based on the measure's target to plant 500 trees annually beginning in 2026, the total estimated cost is approximately $277,500 by 2030 and an additional $832,500 by 2045. This estimate conservatively assumes all new trees will be public trees, which are generally more expensive than private trees.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the tree planting goals established by Measure NWL-1.

Action ID	Action Description	Phase	Pillars
NWL-1.1	Leverage existing tools such as the Tree Equity Score and local GIS datasets to conduct a cost-effective assessment of tree canopy and riparian corridors across the MSA. Supplement these resources with targeted LiDAR and satellite imagery in data-poor or unincorporated areas to identify priority planting zones and estimate carbon sequestration potential.	1	F
NWL-1.2	Develop model urban forestry and riparian buffer standards for integration into General Plans and zoning codes across the MSA. These standards will build on existing setback requirements by emphasizing consistent regional implementation, climate-resilient native species, strategic tree preservation, and minimum canopy coverage in new development and redevelopment projects.	1-2	SC
NWL-1.3	Establish a Tree and Riparian subcommittee within the VCREA including local jurisdictions land conservation organizations, and CBOs to align planting priorities, share data and resources, and coordinate MSA-wide stewardship and restoration events.	1-2	P
NWL-1.4	Utilize existing resources—such as the Ventura County Air Pollution Control District's *Tree Planting and Air Quality* guide and The Nature Conservancy's *Pathways to Nature-Based Resilience*—to develop a regional public education campaign. The campaign will be shared through schools, libraries, and CBOs to raise awareness of the climate, biodiversity, and health benefits of trees and riparian zones. Include community-led workshops on tree care, native habitat restoration, and the co-benefits of nature-based strategies, with materials adapted for local priorities and multilingual accessibility.	1-2	Ed, P
NWL-1.5	Prioritize tree planting and riparian buffer restoration in historically underserved communities and areas with low tree canopy using tools like CalEnviroScreen and Tree Equity Score. Engage residents through participatory planning to identify priority planting locations and species, guided by a clear set of parameters such as drought tolerance, canopy size, maintenance needs, and compatibility with local ecosystems—confirming selections align with current best practices in climate-resilient urban forestry.	1-2	Pr
NWL-1.6	Pursue funding through CAL FIRE's Urban and Community Forestry Program, the Wildlife Conservation Board, and the California Climate Investments program to support long-term maintenance through workforce development tree planting and canopy tracking, and planning for future replacement tree planting in priority areas.	1-2	$

---

[133] TreePeople. July 2021. Tree Planting Cost-Benefit Analysis: A Case Study For Urban Forest Equity in Los Angeles. Accessed July 22, 2025, at: https://www.treepeople.org/wp-content/uploads/2021/07/tree-planting-cost-benefit-analysis-a-case-study-for-urban-forest-equity-in-los-angeles.pdf

Measure NWL-2: Expand and scale sustainable land management practices across rangelands, parks, and open spaces to enhance ecosystem health, improve soil and water resilience, reduce wildfire risk, and support biodiversity and long-term land productivity.

Measure Description

Sustainable land management and open space conservation are essential tools to sequester carbon, reduce wildfire risk, and improve long-term ecosystem health. Measure NWL-2 supports the scaling of regenerative land practices across rangelands, parks, and open spaces to promote biodiversity, improve watershed resilience, and reduce climate risk. A key component of this measure is the development of a regional land cover and carbon impact assessment tool that integrates conservation, housing, and infrastructure overlays to evaluate land use transitions and their carbon implications. This tool will help jurisdictions align General Plan updates with low-carbon, climate-resilient land use strategies that respect existing frameworks like SOAR and advance local conservation goals.

Implementation efforts also include developing model policies that incentivize open space conservation and land stewardship, as well as facilitating partnerships between local governments, community-based organizations, and private landowners to support voluntary land conservation. NWL-2 calls for a regional landowner engagement program to identify high-priority conservation areas and align acquisitions with habitat connectivity, reforestation, and flood resilience goals. A regional education and outreach program will support widespread adoption of sustainable practices through workshops, Tribal partnerships, interpretive signage, and multilingual materials. By promoting inclusive participation and securing ongoing funding, NWL-2 seeks to unlock the climate and ecological potential of the MSA's natural and working lands.

The following table summarizes the key descriptive information for the measure.

Table 41 Measure NWL-2 Summary

Expand and scale sustainable land management practices across rangelands, parks, and open spaces to enhance ecosystem health, improve soil and water resilience, reduce wildfire risk, and support biodiversity and long-term land productivity.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	13,14
Metrics for Progress Tracking	▪ Acres of open space expansion ▪ Acres of conservation areas acquired
Applicable EPA Sector(s)	Agriculture and Land Management

Cost Discussion

Implementation costs for Measure NWL-2 stem primarily from developing a land cover and carbon impact assessment tool, developing model policies, coordinating conservation area acquisitions, and providing outreach and education. The most significant costs will likely come from the conservation area acquisitions. These costs vary widely depending on the property value and size of the area. For

example, the Ventura Land Trust was awarded $7.2 million from the State to acquire and permanently conserve 1,645 acres of land now named the Ventura Hills Nature Preserve.[134] Similarly, the Trust for Public Land was awarded $14.5 million from the Wildlife Conservation Board (WCB) to acquire 6,475 acres known as the Rancho Cañada Large.[135] Measure NWL-2 anticipates leveraging funding from WCB and the California Department of Fish and Wildlife to support collaborative implementation.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the open space conservation goals established by Measure NWL-2.

Action ID	Action Description	Phase	Pillars
NWL-2.1	Develop an MSA-wide land cover and carbon impact assessment tool that integrates open space, housing, and conservation overlays to map historical and potential land use transitions—such as from agricultural to residential or open space to infrastructure—while acknowledging current constraints under SOAR and existing General Plans. Use this tool as part of General Plan updates to evaluate the carbon implications of various land use scenarios and support informed analysis designed to balance housing, conservation, and renewable energy needs. Findings will help jurisdictions proactively guide low-carbon land use decisions into future General Plan and natural resource policy updates.	1	F
NWL-2.2	Develop model policies that can be used throughout the MSA that incentivize open space conservation and expansion through General Plan updates. Promote the inclusion of open space expansion targets in local sustainability frameworks.	1-2	SC
NWL-2.3	Facilitate partnerships between local jurisdictions, CBOs and private landowners by creating a landowner engagement program that identifies and connects willing sellers of high-priority conservation lands—particularly connecting lands to open spaces, riparian corridors and areas with reforestation potential. Use County planning data and existing landowner networks to target outreach and align acquisitions with regional habitat, flood resilience, and carbon sequestration goals.	1-2	P
NWL-2.4	Develop and implement an ongoing education and outreach program focused on sustainable land management practices across the MSA's rangelands, parks, and open spaces. This program will promote ecological stewardship, fire-resilient landscapes, water conservation, native habitat protection, and soil health. Activities will include hands-on workshops, interpretive signage, partnerships with landowners and local Tribes, and community-centered events in both inland and coastal communities.	1-3	Ed, P
NWL-2.5	Support community groups with letters of support for grant applications for community-led stewardship programs that provide stipends, training, and/or tools to co-lead habitat restoration, regenerative grazing projects, peer-to-peer education, implementation of tribal practices, and the development of multi-lingual signs and educational materials	1-2	Pr
NWL-2.6	Continue to identify and apply for funding to continue to protect critical wildlife habitat and biodiversity through programs such as the California Wildlife Conservation Board (WCB) and Department of Fish and Wildlife.	1-2	$

---

[134] Ventura Land Trust. Ventura Hills Nature Preserve. Accessed July 24, 2025, at: https://www.venturalandtrust.org/marianoranchopreserve

[135] California Department of Fish and Wildlife. May 23, 2025. Wildlife Conservation Bard Awars $59.5 Million in Grants to 25 Habitat Conservation and Restoration Projects. Accessed July 24, 2025, at: https://wildlife.ca.gov/News/Archive/wildlife-conservation-board-awards-595-million-in-grants-to-25-habitat-conservation-and-restoration-projects#:~:text=Grants%20Will%20Protect%20Nearly%2023%2C000,major%20watersheds%20and%20national%20forests

Measure NWL-3: Meet SB 1383 procurement targets by annually procuring 39,394 tons of compost by 2030 and 39,811 by 2045.

Measure Description

Improving soil health through compost application and regenerative practices is a critical strategy for enhancing the resilience and productivity of the MSA's working and natural lands. Measure NWL-3 supports the widespread adoption of these practices to boost carbon sequestration, reduce greenhouse gas emissions, and help jurisdictions meet SB 1383 procurement targets by annually securing 39,394 tons of compost by 2030 and 39,811 tons by 2045. The measure promotes nature-based solutions that align with regional goals for agricultural viability, habitat protection, and long-term land stewardship.

Implementation actions include developing an MSA-wide composting program to coordinate compost supply logistics, track pilot outcomes, and support soil carbon initiatives. The measure also promotes model policies that incentivize compost application through General Plan updates and encourages the identification of temporarily fallowed or marginal lands suitable for regenerative practices, including rotational fallowing and cover cropping. NWL-3 prioritizes accessibility by offering compost and technical assistance at low or no cost to BIPOC-led farms, small growers, and community green spaces. Regional workshops, peer-to-peer education, and partnerships with land trusts and agricultural stakeholders will build local capacity and expand access to soil health resources. Funding opportunities through the Healthy Soils Program, CDFA, and USDA will further accelerate implementation across the MSA.

The following table summarizes the key descriptive information for the measure.

Table 42 Measure NWL-3 Summary

Meet SB 1383 procurement targets by annually procuring 39,394 tons of compost by 2030 and 39,811 by 2045.	
GHG Emissions Reduction (2030)	15,622 MT CO$_2$e
GHG Emissions Reduction (2045)	15,787 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	13,14
Metrics for Progress Tracking	**2030 Metric** ▪ 39,394 tons of compost procured annually **2045 Metric** ▪ 39,811 tons of compost procured annually
Applicable EPA Sector(s)	Solid Waste and Waste Generation

Cost Discussion

The emissions reduction from this measure primarily results from the procurement and application of compost across rangelands, parks, and open spaces in the MSA. Because compost procurement helps jurisdictions meet SB 1383 procurement targets, the primary costs of implementation stem from compost purchasing, delivery, and land application. According to a University of California

study, compost costs range from $45 to $62 per ton,[136] while a separate study from Alameda County estimated average compost costs at $38 per ton.[137] Averaging these sources yields an estimated unit cost of $48.33 per ton. Using this estimate, compost procurement costs are approximately $9,520,120 by 2030 and an additional $28,863,120 by 2045, based on target tonnage levels established in the measure.

To support broader adoption of regenerative land management practices including cover cropping, rotational fallowing, and soil carbon farming among farmers, cities, and open space managers, Measure NWL-3 also proposes the creation of a Ventura County Soil Carbon Partnership and the provision of technical assistance and compost subsidies to BIPOC-led farms, small-scale growers, and community green spaces. Regional coordination and incentive programs like this are modeled after existing programs such as the Healthy Soils Program and Climate-Smart Commodities Program, which typically provide between $500,000 and $1 million in regional funding per year. If the Soil Carbon Partnership is able to secure approximately $750,000 in annual grant funding starting in 2026, this would result in a total implementation cost of $3,750,000 by 2030 and an additional $7,500,000 by 2045. These investments would support the transition to climate-smart land stewardship while generating co-benefits such as improved water retention, biodiversity, and soil fertility.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the compost procurement goals established by Measure NWL-3.

Action ID	Action Description	Phase	Pillars
NWL-3.1	Develop model policies that can be used throughout the MSA that incentivize compost application and soil carbon sequestration through General Plan updates and agricultural land conservation policies. Promote the inclusion of soil health targets in local sustainability frameworks.	1	SC
NWL-3.2	Establish an MSA wide composting program to facilitate compost application, coordinate compost supply logistics, and share data on pilot project outcomes.	1-2	SC
NWL-3.3	Develop a regional approach in collaboration with agricultural entities, land trusts, and resource agencies to identify temporarily fallowed or marginal lands suitable for compost application and soil carbon sequestration, prioritizing strategies that maintain agricultural viability and avoid permanent conversion of productive farmland to non-agricultural uses. Encourage regenerative land management practices—such as rotational fallowing and cover cropping—on these lands to enhance soil health, increase carbon storage, and support climate resilience while preserving long-term land productivity.	1-2	P, SC
NWL-3.4	Host regional workshops with UC Cooperative Extension and local RCDs to train growers, land managers, and city parks staff on regenerative practices, compost application techniques, and carbon farming benefits. Develop plain-language fact sheets and case studies.	1-2	Ed

---

[136] University of California Agriculture and Natural Resources. September 28, 2020. Costs of Compost Addition to Grasslands and an Oak Woodland. Accessed July 18, 2025, at: https://ucanr.edu/blog/livestock-range/article/costs-compost-addition-grasslands-and-oak-woodland

[137] Alameda County Resource Conservation District. Feasibility Assessment of Compost Addition on Alameda County Rangelands: Compost Sourcing and Spreading Costs. Accessed July 18, 2025, at: https://acrcd.org/wp-content/uploads/2022/01/Compost-on-Rangelands-Feasibility-PRINT202110-1.pdf

Action ID	Action Description	Phase	Pillars
NWL-3.5	Provide compost and technical assistance at no or reduced cost for BIPOC-led farms, small-scale growers, and publicly accessible community green spaces in priority areas. Pair this with co-learning opportunities led by local peer farmers and nonprofit partners.	1-2	Pr
NWL-3.6	Pursue funding through California's Healthy Soils Program, CDFA's Pollinator Habitat Program, and the USDA's Climate-Smart Commodities program to fund compost purchases, application equipment, and demonstration projects, especially in priority communities.	1-3	$

Measure NWL-4: Implement regional wildfire risk reduction strategies across public and private lands to protect carbon stocks, biodiversity, and community health.

Measure Description

Wildfire risk is increasing across the region due to climate change, prolonged drought, and accumulated fuels, threatening carbon stocks, biodiversity, and the health and safety of communities. Measure NWL-4 outlines a coordinated regional approach to reduce wildfire risk across public and private lands by integrating ecological fuel management strategies that protect high-carbon landscapes and vulnerable communities. This measure prioritizes climate-informed wildfire resilience efforts that are fair, science-based, and rooted in collaboration.

Key actions include building upon the Ventura County Land Cover and Carbon Stock Inventory to conduct a comprehensive wildfire risk and carbon vulnerability assessment, which will inform the identification of priority zones for fuel reduction and restoration. The measure also calls for the development of model wildfire risk reduction policies for adoption into planning documents such as General Plans and Community Wildfire Protection Plans. A regional Wildfire Resilience Network will facilitate coordination among local agencies, land trusts, Tribes, utilities, and private landowners. Outreach will include multilingual homeowner workshops, partnerships with Fire Safe Councils, and culturally relevant training on defensible space and prescribed fire. Together, these efforts aim to reduce wildfire risk while enhancing ecosystem resilience and preserving the region's natural climate assets.

The following table summarizes the key descriptive information for the measure.

Table 43 Measure NWL-4 Summary

Implement regional wildfire risk reduction strategies across public and private lands to protect carbon stocks, biodiversity, and community health.	
GHG Emissions Reduction (2030)	Supportive
GHG Emissions Reduction (2045)	Supportive
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	10,11,15
Metrics for Progress Tracking	▪ Number of regional fuel-management projects completed ▪ Acres of wildfire hazard vegetation removal projects conducted
Applicable EPA Sector(s)	Agriculture and Land Management

Cost Discussion

Implementation costs for Measure NWL-4 stem primarily from conducting a regional wildfire risk and carbon vulnerability assessment, developing model policies, coordinating a cross-sector Wildfire Resilience Network, and providing outreach and training. The most significant costs will likely come from on-the-ground wildfire mitigation activities, including fuel reduction, ecological thinning, and prescribed burns across priority areas. These costs vary widely depending on terrain, vegetation type, and treatment intensity, but CAL FIRE estimates mechanical thinning and fuel breaks can range from $1,000 to $3,000 per acre, while prescribed burns cost approximately $200 to $800 per acre.[138] Measure NWL-4 anticipates leveraging funding from CAL FIRE's Fire Prevention Grant Program and CARB's Forest Health Program to support cross-jurisdictional implementation. Long-term investments in coordinated wildfire risk reduction will not only protect carbon stocks and sensitive ecosystems but also reduce emergency response and recovery costs over time.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the wildfire risk reduction strategies established by Measure NWL-4.

Action ID	Action Description	Phase	Pillars
NWL-4.1	Build off the Ventura County Land Cover and Carbon Stock Inventory to conduct a comprehensive wildfire risk and carbon stock vulnerability assessment to identify priority areas for fuel reduction and restoration, incorporating climate projections and community exposure data.	1	F
NWL-4.2	Develop an improved regulatory model for the MSA to address hazardous vegetation and combustible material to reduce fire hazards on privately owned land. Leverage new and proven approaches to encourage and enforce hazardous fuel abatement requirements for public safety. Complete a comparative analysis of existing ordinance language within the MSA and develop updated ordinance language to be adopted by jurisdictions across the MSA.	1	F, SC
NWL-4.3	Develop model wildfire risk reduction policies that can be adopted through planning documents such as General Plans, Community Wildfire Protection Plans, and other ordinances or resolutions. The policies could require strategies such as fuel management, defensible space, and prescribed burns on public and private lands, prioritizing areas with high carbon stocks and biodiversity.	2	SC
NWL-4.4	Create a Wildfire Resilience Network of county agencies, CAL FIRE, local Tribes, RCDs, CBOs, utility providers, and private landowners to coordinate regional fuel-management projects, share best practices, and consolidate grant applications.	1-2	P
NWL-4.5	Develop hands-on workshops and multilingual materials on lessons learned from partnerships with Fire Safe Councils, CAL FIRE, and local Tribes for homeowners and land managers on creating and maintaining defensible space, ecological thinning, and low impact prescribed burning practices.	1-2	Ed
NWL-4.6	Develop priority risk reduction areas across the MSA— high wildland-urban interface zones and communities with high vulnerability—by using CalEnviroScreen data and community input to guide fuel management and outreach.	1	Pr
NWL-4.7	Pursue CAL FIRE's Fire Prevention Grant Program and CARB's Forest Health Program to fund cross-jurisdictional fuel reduction, prescribed fire, and ecological restoration projects.	1-3	$

---

[138] Resources for the Future. January 2025. The Costs of Achieving Forest Resilience in California. Accessed July 18, 2025, at: https://media.rff.org/documents/WP_25-03.pdf

4.8   Agriculture

The MSA is a top producer of agricultural products, contributing over $2.1 billion to the local economy.[139] The County leads California in the production of avocados, raspberries, and kale.[140] In 2022, agriculture accounted for two percent (104,901 MT CO_2e) of emissions in the Ventura MSA. In California, agriculture is a leading contributor of nitrous oxide (N_2O) emissions, accounting for over half of California's total N_2O emissions.[141] N_2O is generated through microbial activity in the soil, where nitrogen from fertilizers, manure, and crop remnants are transformed into various nitrogen compounds.[142]

The MSA is home to over 2,150 farms across[143] 98.5 acres of farmland,[144] and in 2021 it was estimated that the gross value of agriculture grown across the County was $2.1M. Approximately 15 percent of the MSA's agricultural products are produced for local consumption, with the remaining 85 percent shipped out of the MSA, fostering economic growth. As stated in the Ventura County 2040 General Plan, according to the Census of Agriculture, the average size of farms in the MSA was 131 acres while the median was 12 acres, indicating that there are many more small farms than large ones. In fact, almost 80 percent of all farms in the MSA are 49 acres or less. Eleven percent are between 50 and 179 acres, and 11 percent are 180 acres or larger.[145]

Measure AG-1: Accelerate adoption of climate-smart agriculture practices to improve soil health, reduce livestock (enteric fermentation) emissions 15% by 2030 and 35% by 2045, and reduce soil management (synthetic fertilizer) emissions 30% by 2030 and 60% by 2045.

Measure Description

Agriculture is a vital part of the region's economy and identity, but it also contributes significantly to GHG emissions, particularly methane from livestock and nitrous oxide from synthetic fertilizer use. Measure AG-1 seeks to reduce these emissions by accelerating the adoption of climate-smart agricultural practices across the MSA. The measure targets a 15 percent reduction in livestock emissions from enteric fermentation and a 30 percent reduction in soil management emissions by 2030. In doing so, AG-1 supports a transition toward more sustainable food systems while improving soil health and climate resilience on working lands.

To guide implementation, this measure calls for collaboration with the Ventura County Farm Bureau and other stakeholders to identify farms—particularly those with livestock operations or high fertilizer use—that are best positioned to adopt climate-smart practices. These practices include rotational grazing, improved manure management, precision nutrient application, compost use, and

---

[139] County of Ventura. 2025. Agriculture/Weights and Measures. 2025. Accessed June 17, 2025, at: https://awm.venturacounty.gov/.

[140] Ibid.

[141] California Air Resources Board (CARB). 2025. Research on Agricultural Emissions & Mitigation. Accessed June 17, 2025, at: https://ww2.arb.ca.gov/research/research-agricultural-emissions-mitigation

[142] Ibid.

[143] County of Ventura. 2020. Ventura County 2040 General Plan: Chapter 9, Agriculture. Accessed June 17, 2025, at: https://docs.vcrma.org/images/pdf/planning/plans/VCGPU_09_Adopted_Agriculture_September_2020.pdf

[144] County of Ventura. 2022. Touring Ventura County's Agriculture: 2021 Crop & Livestock Report. Accessed June 17, 2025, at: https://awm.venturacounty.gov/wp-content/uploads/2025/01/2021-CR_1.pdf

[145] County of Ventura. 2020. Ventura County 2040 General Plan: Chapter 9, Agriculture. Accessed June 17, 2025, at: https://rmadocs.venturacounty.gov/images/pdf/planning/plans/VCGPU_09_Adopted_Agriculture_September_2020.pdf

---

methane-reducing feed additives. A new Climate-Smart Agriculture Collaborative will coordinate regional efforts, share technical knowledge, and promote peer-to-peer learning. Integration of these practices into local agricultural and land use policies will further align regional planning with climate and soil health goals.

AG-1 also prioritizes accessibility by delivering targeted outreach, technical assistance, and financial support to small-scale and BIPOC-led farms, especially those in areas facing high environmental burdens. Multilingual trainings and demonstration projects will be provided in partnership with UC Cooperative Extension, local resource conservation districts, and farmer organizations to build capacity across diverse agricultural operations. Funding will be pursued through programs such as California Department of Food and Agriculture's (CDFA) Healthy Soils Program, U.S. Department of Agriculture's (USDA) Climate-Smart Commodities, and Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program, with a focus on piloting innovative practices that reduce emissions and support long-term agricultural viability. Through these actions, AG-1 advances a just and climate-resilient future for the MSA's agriculture.

The following table summarizes the key descriptive information for the measure.

Table 44 Measure AG-1 Summary

Accelerate adoption of climate-smart agriculture practices to improve soil health, reduce livestock (enteric fermentation) emissions 15% by 2030 and 35% by 2045, and reduce soil management (synthetic fertilizer) emissions 30% by 2030 and 60% by 2045.	
GHG Emissions Reduction (2030)	28,807 MT CO_2e
GHG Emissions Reduction (2045)	58,375 MT CO_2e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	12,14,16
Metrics for Progress Tracking	**2030 Metrics** ▪ 15% reduction in livestock methane emissions ▪ 30% reduction in synthetic fertilizer use **2045 Metrics** ▪ 35% reduction in livestock methane emissions ▪ 60% reduction in synthetic fertilizer use
Applicable EPA Sector(s)	Agriculture and Land Management

Cost Discussion

The emissions reduction from Measure AG-1 results from cattle feed improvements and reducing synthetic fertilizer use. Costs for these efforts were determined separately.

CATTLE FEED IMPROVEMENT

Reducing enteric fermentation emissions from cattle can be achieved through improving the quality of the cattle's feed. This cost analysis was estimated based on the total population of beef and other cattle in the MSA's agricultural inventory (see Appendix A Greenhouse Gas Inventory Analysis Report for details). To achieve the target emissions reduction, it was assumed that a maximum

methane reduction of 35 percent can be achieved through improved cattle feed.[146, 147] Therefore, to achieve a 15 percent total reduction in emissions by 2030, approximately 43 percent of the County's cattle would need to be influenced.

The cost was calculated as the difference in operating costs between conventional cattle feed ($9.48/kg of protein product) and improved feed that reduces methane emissions ($13.38/kg of protein product).[148] This value was then converted to a per-animal cost using standard assumptions for kilograms of meat per cow and protein content per kilogram of meat. Based on these calculations, the estimated incremental cost of implementing improved feed is $205 per head of cattle. This cost, multiplied by the number of annual cattle needed to be influenced to meet the target from Table 44 above, yields the following costs summarized in Table 45. This analysis focuses solely on cattle in Ventura County, which account for approximately 88 percent of the County's enteric fermentation emissions. While the County also has swine, sheep, goats, and horses, data on mitigation strategies and associated costs for these animals is currently limited and was therefore excluded from this cost estimate.

Table 45 Measure AG-1 Livestock Methane Emissions Reduction Cost Summary

Variable	Units	2030	2045
Annual Cattle Population with Improved Feed[1]	Cattle	2,554	5,960
Conventional Operating Costs[2]	Dollars/kg of protein produced	$9.48	$9.48
Improved Cattle Feed Operating Costs[2]	Dollars/kg of protein produced	$13.38	$13.38
Beef Product Per Cattle[3]	kg beef/cattle	150	150
Protein Per Beef Product[4]	g protein/g product	0.35	0.35
Incremental Cost Per Cattle	Dollars/cattle	$204.75	$205
Implementation Years	Years	5	15
Total Costs	**Dollars**	**$2,614,950**	**$18,304,650**

Notes: kg = kilogram; g = gram.

Sources:

1. Includes beef and other cattle from the 2022 agriculture inventory for the MSA. Adjusted for Measure AG-1's implementation goals.

2. Project Drawdown. Improved Cattle Feed. Accessed July 22, 2025, at: https://drawdown.org/solutions/improved-cattle-feed.

3. Rivers Family Farm. How Much Beef Will You Get from a Cow: Breakdown. Accessed July 22, 2025, at: https://riversfamilyfarm.com/how-much-beef-from-a-cow/.

4. Beef Cattle Research Council. Nutritional Qualities of Beef. Accessed July 22, 2025, at: https://www.beefresearch.ca/topics/nutritional-qualities-of-beef/#:~:text=A%20100%2Dgram%20serving%20of,considered%20a%20low%20sodium%20option.

---

[146] Ermias Kebreab and Xiaoyu Feng. 2021. Strategies to Reduce Methane Emissions from Enteric and Lagoon Sources. Accessed July 24, 2025, at: https://ww2.arb.ca.gov/sites/default/files/2020-12/17RD018.pdf

[147] Ermias Kebreab and Xiaoyu Feng. 2020. Net Reductions in Greenhouse Gas Emissions from Feed Additive use in California Dairy Cattle. Accessed July 24, 2025, at: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0234289

[148] Project Drawdown. Improved Cattle Feed. Accessed July 22, 2025, at: https://drawdown.org/solutions/improved-cattle-feed

SYNTHETIC FERTILIZER USE

Reducing nitrous oxide (N_2O) emissions from synthetic fertilizer can be achieved through improving fertilizer efficiency by optimizing fertilizer type, rate, location, and timing as well as irrigation methods. This cost analysis was estimated based on total nitrogen (N) applied in the MSA's agricultural inventory (see Appendix A Greenhouse Gas Inventory Analysis Report for details). To meet the N_2O emissions reduction target, it was assumed that a maximum 60 percent reduction in N_2O emissions can be achieved through improved fertilizer practices.[149] Therefore, achieving a 30 percent overall reduction by 2030 would require influencing approximately 50 percent of the nitrogen applied countywide.

The cost analysis focuses on reducing emissions through fertilizer type. It was calculated as the difference in material unit cost between ammonia-based fertilizers, a commonly used synthetic fertilizer with high N_2O emissions, and urea ammonium nitrate, a lower-emission alternative.[150] Urea-based fertilizers are generally less expensive than ammonia-based options, producing cost savings for the community. As of July 2025, the cost difference between these two fertilizer types was estimated at $54.43 per ton of nitrogen.[151,152] This value reflects market prices at a specific point in time and is subject to significant fluctuation. This cost, multiplied by the annual tons of nitrogen needed to meet the target from Table 44 above, yields the following costs savings summarized in Table 46.

It is important to note that this estimate does not include differences in application costs. Various fertilizers require different handling and application methods, which may vary in labor intensity and overall operational cost. As such, the cost estimate presented here is a conservative, partial representation of the full costs associated with transitioning to lower-emission fertilizer practices.

Table 46 Measure AG-1 Synthetic Fertilizer Use Reductions Cost Summary

Variable	Units	2030	2045
Synthetic Fertilizer Substituted for Urea-Based Fertilizer	Tons	11,508	23,015
Unit Cost of Ammonia[1]	Dollars/ton	$408.23	$408.23
Unit Cost of Urea Ammonium Nitrate[2]	Dollars/ton	$353.80	$353.80
Incremental Unit Cost	Dollars/ton	($54)	($54)
Implementation Years	Years	5	15
Total Costs	**Dollars**	**($3,131,829)**	**($18,790,971)**

Notes: () indicate negative values or cost savings.
1. Business Analyiq. Urea ammonium nitrate (UAN) price index. Accessed July 22, 2025, at: https://businessanalytiq.com/procurementanalytics/index/urea-ammonium-nitrate-uan-price-index/

2. Business Analytiq. Ammonia price index. Accessed July 22, 2025, at: https://businessanalytiq.com/procurementanalytics/index/ammonia-price-index/

---

[149] University of California Agriculture and Natural Resources. Solution Center for Nutrient Management. Nitrous Oxide and California Agriculture. Accessed July 22, 2025, at: https://ucanr.edu/site/solution-center-nutrient-management/nitrous-oxide-and-california-agriculture

[150] Ibid

[151] Business Analyiq. Urea ammonium nitrate (UAN) price index. Accessed July 22, 2025, at: https://businessanalytiq.com/procurementanalytics/index/urea-ammonium-nitrate-uan-price-index/

[152] Business Analytiq. Ammonia price index. Accessed July 22, 2025, at: https://businessanalytiq.com/procurementanalytics/index/ammonia-price-index/

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the climate-smart agriculture goals established by Measure AG-1.

Action ID	Action Description	Phase	Pillars
AG-1.1	Work with the Ventura County Farm Bureau to identify farms—particularly those with livestock operations or significant fertilizer usage. Evaluate economic feasibility, farm size, crop/livestock types, and technical capacity to guide tailored program design and resource allocation to reduce methane and nitrous oxide emissions.	1	F
AG-1.2	Integrate climate-smart practices targeting enteric fermentation and synthetic fertilizer reductions into MSA agricultural policies and land use frameworks. Develop guidelines and incentives for precision nutrient management, use of organic soil amendments, rotational grazing, improved manure management, and inclusion of feed additives proven to reduce methane emissions from livestock.	1-2	SC
AG-1.3	Establish a Climate-Smart Agriculture committee throughout the VCREA Climate Collaborative comprising growers, land trusts, extension services, agricultural commissioners, nonprofits, and other interested parties. This group will coordinate technical assistance, share best practices, and foster peer-to-peer learning to accelerate regional adoption and innovation.	1	P
AG-1.4	Partner with UC Cooperative Extension, VCRCD, and farmer organizations to host multilingual trainings and demonstration projects that highlight strategies to reduce emissions from livestock and synthetic fertilizers. Trainings will cover practices such as improved pasture management, alternative livestock feeds, manure composting, use of slow-release fertilizers, and cover cropping for nitrogen retention. Build upon the Ventura County Resilient Agricultural Lands Initiative (RALI) to align messaging, leverage existing networks, and implement local priorities identified through the initiative.	1-2	Ed
AG-1.5	Deliver targeted outreach, technical assistance, and financial support to small farms and BIPOC-led operations located in priority areas. Emphasize practices that reduce exposure to harmful air and water pollution from synthetic fertilizers and animal waste, supporting both climate and public health benefits.	1-2	Pr
AG-1.6	Pursue grants from CDFA's Healthy Soils Program, USDA's Climate-Smart Commodities, and Natural Resources Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP), as well as partnerships with academic institutions and climate-focused private companies. Focus funding on pilot projects that demonstrate emissions reduction through improved grazing, feed management, manure handling, and synthetic nitrogen fertilizer alternatives.	1-3	$

Measure AG-2: Create an agricultural equipment decarbonization program to reduce agricultural fuel use by 30% by 2030 and 100% by 2045.

Measure Description

Reducing fuel use from agricultural equipment is a key step toward lowering greenhouse gas emissions and improving air quality in the MSA. Measure AG-2 aims to accelerate the transition from diesel-powered machinery to zero-emission and low-emission alternatives, targeting a 30 percent reduction in agricultural fuel use by 2030 and a 100 percent reduction by 2045. This measure focuses on supporting farmers through coordinated policies, incentives, and technical assistance that facilitate equipment electrification and renewable fuel adoption while aligning with state regulations such as CARB's clean off-road equipment standards.

Key actions include developing an MSA-wide policy framework to create permitting pathways and incentives that encourage adoption of electric tractors, pumps, and other equipment. The measure calls for a comprehensive inventory of existing agricultural equipment to identify priority opportunities for electrification and renewable fuels, along with modeling to guide program design. A dedicated Agricultural Equipment Decarbonization Task Force will coordinate stakeholders, streamline communication, and co-develop pilot projects. Innovative approaches such as an agricultural equipment cooperative will help reduce ownership costs and promote shared resources among farms.

Outreach and capacity-building efforts will be led in partnership with UC Cooperative Extension, Ventura County Resource Conservation District, and the Farm Bureau, offering tailored workshops and user-friendly materials that explain clean equipment technologies and operational considerations. Special attention will be given to small farms and those led by BIPOC and women operators, who often face greater barriers to accessing clean equipment. Funding will be sought from state and federal programs like the Carl Moyer Program, USDA's Rural Energy for America Program grant, and CARB's Funding Agricultural Replacement Measures for Emissions Reduction Program, as well as local initiatives, with an emphasis on supporting priority communities and simplifying grant application processes.

The following table summarizes the key descriptive information for the measure.

Table 47 Measure AG-2 Summary

Create an agricultural equipment decarbonization program to reduce agricultural fuel use by 30% by 2030 and 100% by 2045.	
GHG Emissions Reduction (2030)	17,132 MT CO$_2$e
GHG Emissions Reduction (2045)	50,981 MT CO$_2$e
Milestones for Obtaining Implementation Authority	Identifying a lead agency and obtaining implementing authority underway; currently under review by the CPRG Working Group
Geographic Location	Ventura County
Potential Funding Sources	12,16,24,25,26
Metrics for Progress Tracking	**2030 Metrics** ▪ 30% of agricultural equipment decarbonized ▪ 1,639,447 gallons of agricultural equipment fuel reduced **2045 Metrics** ▪ 100% of agricultural equipment decarbonized ▪ 4,879,743 gallons of agricultural equipment fuel reduced
Applicable EPA Sector(s)	Transportation; Agriculture and Land Management

Cost Discussion

The number of all-electric farm equipment is increasing rapidly, and several programs have been developed within California to help incentivize the adoption of these new technologies. The California CORE program provides a list of available equipment including tractors, landscape equipment, freight moving equipment, and more. Electric tractors like those from Monarch Tractor can cost between $80,000 and $100,000 but the CORE program can reduce costs by up to

$68,000.[153, 154] Additional equipment including forklifts, refrigeration units, pumps, and more are also being made in all-electric versions. Costs are variable depending on equipment type and most electric equipment costs more up-front compared to their conventional counterparts. However, between fuel and maintenance cost savings, electric equipment can help save money over time.

Implementation Actions

The following table presents the list of actions to be implemented in support of achieving the agricultural equipment decarbonization goals established by Measure AG-2.

Action ID	Action Description	Phase	Pillars
AG-2.1	Work with VCAPCD to establish an MSA-wide policy framework that supports the transition of agricultural operations from diesel-powered to zero-emission or low-emission equipment. This includes creating permitting pathways and incentive structures that encourage adoption of electric tractors, pumps, and other field equipment, while supporting alignment with CARB's clean off-road equipment regulations.	1-2	SC
AG-2.2	Work with Ventura County Air Pollution Control District to conduct an MSA-wide inventory of existing agricultural equipment by type, fuel source, and usage patterns to identify the most impactful opportunities for electrification or renewable fuel substitution. Use this data to model emissions reduction potential, infrastructure needs, and cost scenarios, helping inform future program design.	1	F
AG-2.3	Form a Ventura County Agricultural Equipment Decarbonization Task Force, including growers, equipment dealers, utility representatives, and Ventura County Air Pollution Control District to streamline communication, coordinate technical support, and co-develop pilot projects and grant applications.	1	P
AG-2.4	Work with farmers, the Ventura County Air Pollution District, and landowners in the region to support the creation of an agricultural cooperative where electric off-road equipment that would be used at farms can be rented on an as-needed basis to reduce direct ownership costs and support a regional transition through shared resources.	1-2	P
AG-2.5	Partner with UC Cooperative Extension, VCRCD, and the Ventura County Farm Bureau to provide tailored workshops and outreach materials on available clean equipment technologies, including case studies from local farms. Develop easy-to-understand guidance for farmers on equipment maintenance schedules, charging/fueling logistics, estimated operational range by task, cost comparisons, and tips for selecting the right equipment for different crop types or farm sizes.	1-2	Ed
AG-2.6	Direct technical and financial support toward small-scale farms, operations located in priority communities, and BIPOC, women-led, or low-income farmers which often face higher barriers to accessing clean equipment and incentive programs.	1-2	Pr
AG-2.7	Leverage state and federal programs such as the Carl Moyer Program, USDA's REAP grant, the FARMER Program, and Ventura County Air Pollution Control District's Clean Air Fund to fund equipment replacements and charging or refueling infrastructure. Seek additional funding through utility partnerships, with streamlined application support for priority groups.	1-3	$

---

[153] Monarch Tractor. California CORE Subsidy Program. Accessed July 15, 2025, at: https://www.monarchtractor.com/california-core-subsidy-inquiry

[154] California Core. Equipment Categories: Agriculture. Accessed July 15, 2025, at: https://californiacore.org/equipment-category/agriculture/

5 Benefits Analysis

While the primary focus of the CCAP is to mitigate GHG emissions, many of the measures will also provide additional benefits or co-benefits for the MSA. While burning fossil fuels creates GHG emissions that drive climate change, they also produce air pollutants such as particulate matter (PM$_{2.5}$ which is matter that is 2.5 micrometers or less in diameter and PM$_{10}$, which is particulate matter that is 10 micrometers or less in diameter), nitrogen oxides (NO$_x$), sulfur oxides (SO$_x$), and volatile organic compounds (VOCs) which are considered co-pollutants. These co-pollutants are major contributors to smog formation, respiratory illness, and other public health concerns. Unlike GHGs, which impact the global climate over time, reductions in these co-pollutants can lead to more immediate and localized improvements in air quality, benefiting residents and households across the region.

Understanding and quantifying these additional benefits helps build a more comprehensive picture of the value of climate action, especially for communities already burdened by poor air quality. The distribution of these co-pollutant reduction benefits, particularly as they relate to priority communities, are addressed in greater detail in Section 6.

5.1 Co-Pollutant Reduction Methodology and Summary

The proposed GHG reduction measures outlined in this CCAP will result in substantial co-pollutant reductions across the MSA. Key pollutants anticipated to be reduced include PM$_{2.5}$ and PM$_{10}$, NO$_x$, SO$_x$, VOCs, and other air toxics such as ammonia (NH$_3$) and lead. Co-pollutant reductions were quantified at the measure level. The following section outlines the methodologies employed to quantify the co-pollutant reductions expected to be generated by fully implementing each measure.

Carbon-Free Electricity

By shifting to renewable and carbon-free electricity sources such as solar and wind energy, the MSA will play a meaningful role in reducing the need for combustion of fossil fuels, primarily natural gas, at regional power plants.[155] As a result, the co-pollutant reductions are realized at the source of generation, often located in or near priority communities with existing air quality burdens. This shift not only contributes to regional improvements in air quality but also reduces upstream environmental and public health impacts associated with fuel extraction, transportation, and combustion.

Co-pollutant reductions associated with the transition to carbon-free electricity were estimated using avoided emission rates generated from the U.S. EPA's AVoided Emissions and geneRation Tool (AVERT) model.[156] Sourced from a federal agency (i.e., U.S. EPA), these data are considered of the highest data quality. This tool provides California-specific avoided emission factors per megawatt-hour (MWh) of displaced fossil fuel-based electricity generation. The model includes emission factors for NO$_x$, SO$_x$, PM$_{2.5}$, VOCs, and NH$_3$. Reductions were calculated by multiplying the estimated

---

[155] Regional power plants in the MSA include the McGrath Peaker Power Station and the Oxnard Power Station.

[156] U.S. Environmental Protection Agency. April 11, 2024. Avoided Emission Rates Generated from AVERT. Accessed June 17, 2025, at: https://www.epa.gov/avert/avoided-emission-rates-generated-avert

megawatt-hours (MWh) of avoided fossil fuel-derived electricity by the corresponding AVERT emission factors.

Building Natural Gas

Reducing natural gas consumption in buildings through electrification of space and water heating, cooking appliances, and industrial equipment directly lowers on-site combustion of fossil fuels. This results in indoor and neighborhood-level air quality benefits within homes, schools, and workplaces. Indoor combustion, especially in poorly ventilated spaces, has been linked to respiratory illnesses and other health concerns; thus, these reductions yield substantial public health co-benefits. Lowering demand for natural gas also decreases upstream emissions from gas extraction, processing, and pipeline distribution, which are often concentrated in rural or priority communities near production fields or compressor stations. Therefore, the benefits of this measure are both local, within buildings and urban neighborhoods, and regional, across the broader natural gas supply chain.

Reductions in natural gas-related emissions were estimated using emission factors from the U.S. EPA's AP-42 Compilation of Air Pollutant Emissions Factors.[157] Sourced from a federal agency, these data are considered of the highest data quality. These include emissions for NO_x, SO_x, PM, VOCs, and lead per therm of natural gas avoided. Emission reductions were derived by applying these factors to projected reductions in natural gas usage across residential and nonresidential sectors.

On-road Transportation

Transportation measures such as mode shift to active transportation and vehicle electrification directly reduce the consumption of gasoline and diesel fuels in internal combustion engine vehicles. As a result, co-pollutant emissions are reduced at the point of use including on highways, arterials, and local roads, where people live, work, and commute. These localized emissions reductions are especially impactful in urban areas and near major roadways, where populations are exposed to elevated levels of air pollution. Reducing fuel use in the transportation sector also helps lower upstream emissions from refining and transporting petroleum products, further amplifying the benefits across regions tied to California's fuel supply chain.

Co-pollutant reductions resulting from transportation-related measures were calculated using the CARB EMFAC model.[158] Sourced from a state agency (i.e., CARB), these data are considered of the highest data quality. EMFAC provides county-level emission rates for NO_x, SO_x, $PM_{2.5}$, and PM_{10} per VMT for on-road sources. To accurately reflect emissions across the MSA, emission rates were weighted based on total VMT in each county. Avoided VMT from combustion vehicles was then multiplied by these weighted emission factors to estimate total pollutant reductions.

Off-road Equipment

Off-road decarbonization measures such as electrifying construction and agricultural equipment directly reduce gasoline, diesel, and natural gas use and associated co-pollutants. These measures align with CARB's SORE Regulation,[159] which phases out sales of new gas-powered small engines by

---

[157] U.S. Environmental Protection Agency. 2025. AP-42: Compilation of Air Emissions Factors from Stationary Sources. Accessed June 17, 2025, at: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources

[158] California Air Resources Board (CARB). Mobile Source Emissions Inventory. Accessed June 17, 2025, at: https://ww2.arb.ca.gov/our-work/programs/msei/mobile-source-emissions-inventory/about

[159] CARB. Small Off-Road Engines (SORE). Accessed July 25, 2025, at: https://ww2.arb.ca.gov/our-work/programs/small-off-road-engines-sore

2024 and supports broader goals to reduce emissions in residential and rural areas. Agricultural equipment transitions, including electric tractors and cleaner irrigation systems, are also part of this strategy and are supported by programs such as CARB's Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program.[160] These changes reduce exposure to harmful pollutants near homes and worksites, particularly in priority communities.

Co-pollutant reductions resulting from offroad-related measures were calculated using the CARB OFFROAD model.[161] Sourced from a State agency, these data are considered of the highest data quality. OFFROAD models county-level emissions for NO_x, SO_x, NH_3, $PM_{2.5}$, and PM_{10} from off-road sources. For all residential and non-residential off-road sectors,[162] total co-pollutants from off-road fossil-fuel use (gasoline, diesel, and natural gas) were multiplied by the proportion of these fuels subject to SORE regulations to estimate total co-pollutant reductions. For the agriculture sector, total co-pollutants from agricultural off-road equipment fuel use (gasoline, diesel, and natural gas) were multiplied by the fuel reduction targets (30 percent reduction by 2030 and 100 percent by 2045) for the agricultural off-road sector to estimate total co-pollutant reductions.

Carbon Sequestration

Tree planting and compost application measures support long-term climate resilience by sequestering carbon in vegetation and soils. These measures can offer indirect co-benefits such as improved air quality from urban canopy cover or avoided emissions from synthetic fertilizers, but they do not directly reduce combustion-related co-pollutants like $PM_{2.5}$, VOCs, or NO_x. Quantifying co-pollutant reductions from these measures was not possible due to the lack of standardized methods and limited region-specific data. For example, the pollutant removal benefits of trees vary by species, planting density, and local meteorological conditions, while the co-pollutant impacts of compost application depend on factors such as soil type, application method, and baseline land management practices. Because of these site-specific variables and limited emissions data, reliable, measurable co-pollutant reduction estimates are not currently available for these carbon sequestration actions.

Solid Waste

Reducing the amount of organic waste sent to landfills helps decrease the production of landfill gas, which contains not only methane but also co-pollutants such as VOCs and NO_x. These pollutants contribute to local air quality issues and pose health risks to nearby communities. While reducing organic waste in landfills can reduce these co-pollutants, quantifying co-pollutant reductions was not possible due to limited availability of standardized emission factors and region-specific data. Emissions of pollutants like VOCs and NO_x can vary significantly based on landfill conditions (e.g., moisture, temperature, waste composition), management practices, and climate. Due to this, few peer-reviewed studies or regulatory tools provide consistent, measurable emission factors for these variables.

Imported Water

Co-pollutant reductions associated with water conservation and reuse measures are primarily driven by indirect decreases in electricity use, specifically, the energy required to convey and treat

---

[160] California Air Resources Board (CARB). FARMER Program. Accessed July 25, 2025, at: https://ww2.arb.ca.gov/our-work/programs/farmer-program

[161] CARB. OFFROAD. Accessed July 25, 2025, at: https://arb.ca.gov/emfac/offroad/

[162] Excluding agriculture because co-pollutant reductions associated with agricultural off-road equipment was quantified separately.

imported water. To estimate these reductions, the electricity avoided through reduced water consumption was applied to co-pollutant emission factors from the U.S. EPA's Emissions & Generation Resource Integrated Database (eGRID) for the CAMX subregion (California's electric grid).[163] The CAMX subregion was used to represent electricity emissions from imported water, as the exact sources of all imported water across the MSA are not fully known. U.S. EPA's eGRID provides emission factors for NO_x, SO_x, $PM_{2.5}$, VOCs, and NH_3. Sourced from a federal agency, these data are considered of the highest data quality.

Wastewater

Decarbonizing the wastewater sector can reduce emissions of both GHG and co-pollutants such as NO_x, SO_x, and VOCs, which are associated with the electricity and natural gas used to power treatment facilities. These indirect emissions are tied to the energy intensity of wastewater conveyance, treatment, and discharge processes. Reducing wastewater volume through conservation, source reduction, or graywater reuse can therefore yield co-benefits for local and regional air quality.

However, quantifying co-pollutant reductions from wastewater-related measures is challenging due to the limited availability of standardized emission factors specific to wastewater operations. Emission levels can vary based on treatment technology, energy source, facility size, and operational efficiency. Additionally, direct emissions from biological treatment processes (e.g., nitrous oxide from nitrification-denitrification) are difficult to quantify without site-specific data. As a result, few peer-reviewed studies or regulatory frameworks offer consistent, measurable co-pollutant emission factors for wastewater treatment processes.

A summary of the anticipated co-pollutant reductions is shown in Table 48 below, while a more detailed summary of the co-pollutant reductions by suite of measures is shown in Table 49.

Table 48 Oxnard-Thousand Oaks-Ventura MSA Summary Totals for Co-Pollutants for 2030 and 2045 (metric tons) Overview and Methodology

Co-Pollutant	2030 Reduction Total	2045 Reduction Total
NO_x	1,331	2,371
SO_x	47	16
$PM_{2.5}$	127	100
PM_{10}	48	63
VOC	35	34
NH_3	67	2
Lead	0.00	0.03

---

[163] U.S. Environmental Protection Agency. Emissions & Generation Resource Integrated Database (eGRID). Accessed July 25, 2025, at: https://www.epa.gov/egrid

Table 49 Oxnard-Thousand Oaks-Ventura MSA Detailed Co-Pollutants, Activity Data, and Emission Factors by Sector for 2030 and 2045 (metric tons)

Measure ID	Sector	Co-Pollutant	2030 Activity Data	2045 Activity Data	Unit	2030 Emission Factor	2045 Emission Factor	Unit	2030 Reductions	2045 Reductions
BE-1	Clean Electricity	NO_x	4,498,129,093	10,006,226,731	carbon-free kWh	6.6E-08	0	MT/kWh	299	0
		SO_x				9.4E-09	0		42	0
		$PM_{2.5}$				1.8E-08	0		80	0
		VOC				6.7E-09	0		30	0
		NH_3				1.5E-08	0		66	0
BE-2 and BE-3	Building Electrification	NO_x	18,828,751	138,055,269	avoided therms	4.2E-06	4.2E-06	MT/therm	79	577
		SO_x				2.7E-08	2.7E-08		1	4
		$PM_{2.5}$				3.4E-07	3.4E-07		6	47
		Lead				2.2E-10	2.2E-10		0.00	0.03
		VOC				2.4E-07	2.4E-07		5	34
TM-2 and TM-3	Alternative Transportation	NO_x	168,446,620	679,720,253	avoided VMT	1.0E-07	2.1E-08	MT/VMT	18	14
		SO_x				1.2E-09	2.6E-10		0.2	0.2
		$PM_{2.5}$				2.3E-09	4.2E-10		0	0
		PM_{10}				2.4E-09	4.5E-10		0	0
TM-4	Passenger ZEV Adoption	NO_x	1,298,062,054	5,056,837,007	EV VMT	1.4E-07	1.2E-07	MT/CVMT	183	613
		SO_x				1.5E-09	1.5E-09		2	8
		$PM_{2.5}$				3.0E-09	2.4E-09		4	12
		PM_{10}				3.3E-09	2.6E-09		4	13
TM-5	Commercial ZEV Adoption	NO_x	87,843,059	827,062,716	EV VMT	8.5E-07	5.0E-07	MT/CVMT	75	416
		SO_x				3.3E-09	3.3E-09		0.3	3
		$PM_{2.5}$				9.8E-09	1.0E-08		1	9
		PM_{10}				1.0E-08	1.1E-08		1	9
TM-6 and AG-2		NO_x	No activity data or emission factor. Emissions directly modeled from CARB's OFFROAD model.						675	750
		SO_x							1	2

Measure ID	Sector	Co-Pollutant	2030 Activity Data	2045 Activity Data	Unit	2030 Emission Factor	2045 Emission Factor	Unit	2030 Reductions	2045 Reductions
	Offroad Equipment Decarbonization	NH$_3$							1	2
		PM$_{2.5}$							35	32
		PM$_{10}$							42	40
SW-1	Landfilled Organic Waste Reduction		No significant reductions expected and insufficient emission factor data available.							
WW-1	Reduce Water Consumption	NO$_x$	19,906,176	20,068,279	avoided water-electricity kWh	1.4E-07	0	MT/kWh	3	0
		SO$_x$				1.0E-08	0		0.2	0
		PM$_{2.5}$				7.6E-09	0		0.2	0
		VOC				5.2E-09	0		0.1	0
		NH$_3$				4.5E-09	0		0.1	0
WW-2	Decarbonize Wastewater Operations		No significant reductions expected and insufficient emission factor data available.							

Notes: CVMT = combustion vehicle miles traveled; EV = electric vehicle; kWh = kilowatt-hour; MT = metric tons; NH$_3$ = ammonia; NO$_x$ = nitrogen oxides; PM$_{2.5}$ = particulate matter 2.5; PM$_{10}$ = particulate matter 10; SO$_x$ = sulfur oxides; VOC = volatile organic compound; VMT = vehicle miles traveled.

5.2   Potential Disbenefits and Mitigation Measures

Although the proposed GHG reduction measures outlined in this CCAP are expected to deliver substantial environmental, health, and economic benefits, potential disbenefits such as increased cost for priority communities have been identified and warrant careful consideration. Recognizing these tradeoffs is critical to confirm that the implementation of climate solutions remains accessible, effective, and responsive to community concerns.

Building Decarbonization

Cost Considerations

While electrification and energy efficiency retrofits can significantly reduce emissions, the upfront costs of these improvements may pose financial burdens, particularly for priority populations. Without targeted funding, rebates, or technical support, there is a risk that these populations could be left behind or disproportionately affected.

The MSA has identified actions aimed at providing widespread and fair access to building decarbonization benefits, such as improved indoor air quality, lower energy bills, and climate resilience. For example, **BE-1.1** integrates outreach about available rebates from 3C-REN, VCREA, and other agencies. **BE-3.4** and **BE-3.5** expand access to subsidies, no-cost audits, and multilingual outreach through trusted partners and programs like 3C-REN, with a focus on priority communities.

Additionally, Action **BE-3.6** proposes piloting retrofit projects in priority communities and using these as case studies to showcase cost-effective approaches for using these all-electric, climate-resilient housing strategies. Action **BE-2.3** outlines permitting support and fee reductions for affordable housing developers working in these areas, while **BE-3.1** and **BE-3.2** explore innovative financing solutions such as on-bill financing and low-interest loans to reduce cost barriers.

To support workforce readiness and economic opportunity, **BE-1.7** and **BE-3.7** establish regional partnerships with community colleges, contractors, and labor groups to expand training pipelines that prepare residents to meet growing demand for energy upgrades and electrification services.

The Regional Climate Coalition will work to pursue grants for the MSA and track the implementation costs of program development and other requirements, adjusting to reduce community burdens where necessary. These actions aim to facilitate shared benefits from building decarbonization such as lower energy bills, cleaner indoor air, and climate resilience.

Grid Reliability and Energy Resilience

While building (and vehicle) electrification will provide significant emissions reduction, pollutant reduction, and cost-savings over time compared to burning natural gas and other fossil fuels, it will also require significant upgrades to the electric grid over time. Without a managed expansion of the grid, reliability of electricity could be a problem. However, grid managers, including California Independent System Operator (CAISO), California Energy Commission (CEC), and utilities, are working to plan around increased electricity use and peak demand.[164]

---

[164] California Energy Commission (CEC). May 2, 2025. California Energy Leaders Report Progress on Grid Reliability Ahead of Summer 2025. Accessed June 17, 2025, at: https://www.energy.ca.gov/news/2025-05/california-energy-leaders-report-progress-grid-reliability-ahead-summer-2025

While electrification will ultimately reduce costs and emissions, it must be supported by coordinated grid planning and resilience strategies. The MSA is advancing several efforts to increase grid flexibility and local resilience. Actions **BE-4.1** through **BE-4.6** focus on identifying and upgrading substations, expanding community-scale microgrids, and implementing advanced energy technologies like virtual power plants (VPPs) and vehicle-to-home charging.

Permitting and infrastructure also play key roles. **BE-1.2** and **BE-2.3** streamline permitting for solar, battery storage, and all-electric construction, providing consistent processes across jurisdictions. **BE-1.3** and **BE-1.4** support deployment of utility-scale and community solar in grid-constrained or underserved areas, while **BE-4.3** develops policies to facilitate seamless integration of distributed energy resources (DERs).

Finally, the MSA will pursue targeted funding to expand local resilience. **BE-1.8**, **BE-2.4**, and **BE-4.6** coordinate utility and jurisdictional applications for state and federal grants such as CPUC's Equity Resiliency Budget or DOE grid modernization funds to provide priority communities with benefit from both infrastructure improvements and long-term energy security.

Electric Vehicle Infrastructure

Cost Considerations

While EVs offer long-term fuel and maintenance savings, the upfront costs, especially for charging infrastructure, continue to present barriers for priority communities and residents who live in multi-family housing developments. The CCAP addresses these challenges through a coordinated set of transportation measures and funding actions. Actions like **TM-4.1** through **TM-4.8** lay out a regionwide approach to expanding access to EV infrastructure via streamlined permitting, model ordinances, and targeted education campaigns. Specifically, the MSA is working with CPA, SCE, and local governments to expand chargers in alignment with the EV Ready Blueprint (**TM-4.3**), while prioritizing rural and historically underserved areas (**TM-4.6**). Multi-family charging access, which is often limited by space and panel capacity, will be addressed through expanded outreach, flexible charging technologies, and new funding mechanisms (**TM-4.4**). Efforts will also include a pilot EV car-share program and curbside charging opportunities (**TM-4.5**). In parallel, education and outreach campaigns (**TM-4.7**) will provide toolkits and EV charging "best practices" to developers, property managers, dealerships, and businesses to help close awareness gaps. Tracking mechanisms will monitor program reach, particularly in priority communities, using metrics like the number of rebates issued, chargers installed, and community-based partnerships leveraged.

Grid Reliability and Energy Resilience

Similar to building electrification, the growing demand for EV charging raises concerns about local grid capacity and reliability, especially in high-demand urban and industrial areas. To mitigate these challenges, the CCAP aligns EV infrastructure expansion with grid-readiness criteria, renewable energy integration, and time-of-use charging strategies. **TM-4.3** emphasizes coordination to develop a publicly accessible database of EV-ready developments to streamline interconnection and target locations with sufficient capacity, while **TM-5.4** and **TM-5.5** focus on supporting medium- and heavy-duty vehicle (MHD) fleets with technical assistance and grid planning support.

The MSA also plans to develop multi-use charging hubs that serve a range of vehicle types including box trucks, freight, and school buses, thereby increasing utilization and improving cost recovery (**TM-5.3**). This effort will be informed by demand modeling and financial feasibility studies to ensure investments pencil out for public and private stakeholders.

To build local resilience, solar-powered and battery-supported charging solutions will be deployed at public facilities (**TM-4.6**), and training partnerships with workforce boards and colleges (**TM-5.6**) will confirm that skilled labor is available to install and maintain EV infrastructure, particularly in disadvantaged communities.

These actions reinforce a just transition by addressing both the energy system and access disparities that could otherwise slow the region's clean transportation transition.

Water and Wastewater Decarbonization

Advancing regional One Water strategies is critical to reducing per capita potable water use and increasing reliance on alternative sources like recycled water and stormwater. These actions support drought resilience and reduce GHG emissions when powered by renewable energy. However, water reuse systems can be energy-intensive, and construction of new infrastructure may raise concerns related to accessibility, environmental impacts, or long-term costs.

To address these risks, the CCAP incorporates safeguards into program design. **WW-1.1** conducts a regional feasibility assessment to model California's Water Use Objective implementation and evaluate the energy, GHG, and lifecycle tradeoffs of various water reuse technologies, confirming that emissions savings are not offset by fossil-powered treatment processes. **WW-1.5** and **WW-1.6** help mitigate cost and access barriers by expanding community participation in conservation efforts and prioritizing funding for One Water infrastructure that benefits historically underserved communities.

Similarly, wastewater decarbonization offers the potential to significantly reduce GHG emissions, manage biosolids sustainably, and generate renewable energy or fuels. But smaller wastewater treatment plants (WWTP) in priority communities may lack the resources to adopt new technologies, and large-scale infrastructure projects can face public resistance. To support accessible implementation, **WW-2.4** provides technical assistance, grant writing, and capacity-building to under-resourced WWTPs. Additionally, **WW-2.5** establishes a Regional Innovation Cohort that pilots emerging solutions like carbon capture, low-emission treatment, and biosolids-to-energy systems in partnership with research institutions and clean tech developers helping to scale technologies responsibly while evaluating their environmental and community impacts.

Together, these actions help confirm that water and wastewater decarbonization strategies deliver on their climate goals while minimizing unintended burdens and enhancing balanced implementation throughout the MSA.

Conclusion

Across all measures, actions have been intentionally designed to minimize or eliminate potential disbenefits, with particular attention to removing unintended consequences. Ongoing monitoring, meaningful engagement with interested parties, and a commitment to adaptive management will confirm that implementation stays responsive to community needs and remains aligned with both climate goals and broader well-being.

6   Priority Communities Analysis

[Placeholder until analysis is completed]

7 Workforce Planning Analysis

The purpose of this Workforce Planning Analysis is to identify the key occupations critical to implementing the strategies outlined in the CCAP, and to highlight workforce challenges that may hinder successful implementation without targeted intervention by the MSA. This analysis also identifies potential partners and programs at the federal, state, regional, and local levels that can help mitigate these challenges and strive for CCAP implementation that is both feasible and accessible.

7.1 Oxnard-Thousand Oaks-Ventura MSA Demographics and Workforce Evaluation

As of 2022, the MSA has a population of 830,434 with approximately 436,802 people who live or work within the MSA.[165] The MSA's per capita income is $76,375 and the top industries include healthcare, biological specimens manufacturing, non-profit organizations, government, police, automobile dealers, machinery manufacturers, tools, education, hospitality, and grocers.[166,167] Despite a generally low unemployment rate of 4.52 percent, many employers face a persistent and widening skill gaps in which job seekers do not have the skills needed to meet employers' needs especially in manufacturing and skilled trades.[168] Of residents age 25 and older, 85.3 percent are high school graduates and 35.7 percent have Bachelor's degrees or higher.[169] In total, 206,196 (approximately 24 percent) of MSA residents live in priority communities in which 86 percent of the population within those priority communities identified as people of color compared to 55 percent in the MSA overall.[170]

7.2 Priority Community Opportunities

Transitioning to a carbon-free economy will require building significant new infrastructure and bolstering entire industries, which will create new jobs across the economy. There will need to be a "just transition" which is defined by the International Labor Organization as "greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work

---

[165] Employment Development Department State of California, 2020.Ventura County Profile. Accessed June 18, 2025, at: https://labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Ventura+County&selectedindex=56&menuChoice=localAreaPro&state=true&geogArea=0604000111&countyName=

[166] Employment Development Department State of California, 2020.Ventura County Profile. Accessed June 18, 2025, at: https://labormarketinfo.edd.ca.gov/cgi/databrowsing/localAreaProfileQSResults.asp?selectedarea=Ventura+County&selectedindex=56&menuChoice=localAreaPro&state=true&geogArea=0604000111&countyName=

[167] Employment Development Department State of California, 2025. Major Employers in Ventura County. Accessed June 18, 2025, at: https://labormarketinfo.edd.ca.gov/majorer/countymajorer.asp?CountyCode=000111

[168] Workforce Development Board of Ventura County. 2025-2028 WDBVC Regional Plan. Accessed June 18, 2025, at: https://vcportal.ventura.org/wdb/workforce-plan/25-28_Regional_Plan.pdf

[169] United States Census Bureau. 2024. QuickFacts Ventura County, California. Accessed June 18, 2025, at: https://www.census.gov/quickfacts/fact/table/venturacountycalifornia/PST045224

[170] County of Ventura. 2024. Thousand Oaks-Oxnard-Ventura Metropolitan Statistical Area (MSA) Priority Climate Action Plan. Accessed June 18, 2025, at: https://sustain.venturacounty.gov/wp-content/uploads/2024/03/TO-Oxnard-Ventura-MSA-PCAP-March-6-2024.pdf

opportunities and leaving no one behind."[171] In a 'just transition" employees of high-carbon fields will need to receive training and support to transition to low-carbon industries so no worker is left behind. Industries that will require significant infrastructure upgrades include clean energy, building electrification, sustainable land management, and electric vehicles. To confirm these industries attract new talent and retain existing talent, these jobs should be "high-road jobs." High-road jobs are characterized by family-sustaining wages, comprehensive health and retirement benefits, safe working conditions, and clear pathways for career advancement. Addressing these workforce challenges will also help reduce costs and implementation timelines for sustainable projects.[172,173]

High-road jobs are central to confirming that climate action initiatives deliver broad and lasting benefits to workers and communities, especially those in priority communities. Strategies for developing high-road jobs provide fair access to opportunities for all workers, regardless of background. Additionally, these jobs foster worker voices through union representation or collaborative labor-management partnerships. By integrating holistic support services such as childcare, transportation, and counseling, high-road jobs help remove barriers to employment and advancement for priority community workers. In this way, climate action can serve as a catalyst for building a more inclusive, resilient, and balanced workforce, confirming that the transition to a low-carbon economy uplifts those who have historically faced the greatest barriers to quality employment. Additionally, agencies can address both workforce shortages and local unemployment by prioritizing recruitment, training, and placement from priority communities, while raising wages and providing career pathways.

7.3   Previous Workforce Analysis

Within the MSA, Ventura County has taken a proactive, multi-faceted approach to align workforce development with climate and environmental sustainability goals. Central to this effort is the Workforce Development Board of Ventura County (WDBVC). In 2024, the WDBVC, in collaboration with the South Central Coast Center of Excellence for Labor Market Research (COE), produced a series of reports analyzing the state of clean and green jobs in the MSA. The analysis assessed job growth potential, risk of automation, worker shortages, and opportunities for workforce development. Drawing on 2022 labor market data and projecting trends through 2027, the reports identified key occupations critical to the region's green transition. These occupations were categorized into four primary industry sectors:

- Advanced Manufacturing;
- Advanced Transportation and Logistics;
- Energy, Construction, and Utilities; and
- Agriculture, Water, and Environmental Technology.

The full reports for these four industry sectors can be found in Appendix F Workforce Planning Analysis Reports.

---

[171] UNDP Climate Promise. 2022. What is just transition? And why is it important? Accessed June 18, 2025, at: https://climatepromise.undp.org/news-and-stories/what-just-transition-and-why-it-important

[172] Gridworks. 2021. What is a High Road Labor Standard?. Accessed June 18, 2025, at: https://gridworks.org/2021/04/what-is-a-high-road-labor-standard/

[173] American Cities Climate Challenges. 2021. High-Road Workforce Guide for City Climate Action. Accessed June 18, 2025, at: https://www.usdn.org/uploads/cms/documents/workforce-guide_4.12.21_form.pdf

7.4   Workforce Analysis Methodology

For each sector (Advanced Manufacturing; Advanced Transportation and Logistics; Energy, Construction, and Utilities; and Agriculture, Water, and Environmental Technology), the analysis includes a detailed table outlining relevant occupations, job descriptions, sample job titles, 2022 employment figures, projected job growth, and the specific CCAP strategies each occupation supports. Each sector includes a table identifying possible workforce challenges highlighted by key metrics as described below. To address these challenges, the analysis identifies workforce development opportunities and strategic partnerships that the MSA can pursue to support a just and accessible transition to a low-carbon economy. A list of potential partners and programs within each sector is included with a focus on enhancing opportunities for priority communities.

There are various factors that could contribute to significant workforce challenges or limit CCAP implementation. Workforce challenges are categorized into three primary areas, each supported by specific evaluation metrics:

Labor Shortages caused by increased demand for workers.

- *Key metrics:* Supply of qualified candidates, job demand, projected job growth, required education

Skill Gaps resulting from technological changes requiring upskilling of the existing workforce

- *Key metrics:* Required education, upskilling needs

Retention and Job Quality Issues driven by low wages, poor working conditions, or limited career advancement

- *Key metrics:* Hourly wages, risk of automation, other challenges

To address these challenges, there are various workforce opportunities that the MSA could pursue, which include:

Recruitment Initiatives   **High-Road Jobs**

Upskilling and Training Programs   **Enhanced Partnerships**

Most data within this analysis comes from COE's reports found in Appendix F Workforce Planning Analysis Reports, however, additional research was conducted and cited to fill in gaps. Whenever feasible, this analysis uses quantitative data for workforce statistics. If no data was available, a qualitative analysis was conducted instead.

Within the COE reports, each occupation was evaluated for current employment levels and anticipated growth, with a six percent or greater increase considered significant. Occupations with projected growth of five percent or less were expected to remain stable.

The COE reports also highlighted median hourly wages, flagging in red the occupations that fall below the local living wage threshold of $22.12/hour for a single adult working full-time, as calculated by the Bureau of Labor Statistics. These lower-wage roles were marked in red to emphasize the need for wage improvements to support sustainable employment.

The COE reports include an expansive list of occupations that WDBVC's Sub-Committee on Clean/Green Jobs, in collaboration with COE, found to be important clean/green jobs within the MSA. Not all of these occupations are relevant to the Strategies that have been adopted as a part of this CCAP. Within the Energy, Construction, and Utilities industry sector, four occupations that were found to be irrelevant to the CCAP Strategies were removed. However, it should be noted that any industry-level data provided in this workforce analysis (including employee demographic data, median annual wage, percent of students employed within a year of completing a program, student demographic data, and top industry employers) represent data from the industries as a whole as reported by COE, including occupations that were removed as a part of this analysis. Individual data of excluded occupations can be found in Appendix F Workforce Planning Analysis Reports.

COE data sources included: O*Net Online, Lightcast™ Analyst (2022), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS), California Community Colleges Chancellor's Office MIS Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, and the Employment Development Department's (EDD) Unemployment Insurance Dataset.

7.5 Key Findings from Primary Industry Sectors

The common workforce challenges that would affect all four primary industry sectors and the cross-industry opportunities that could be used to address such challenges are identified below. Following these key findings are detailed descriptions and data for each of the four primary industry sectors including information such as a list of priority occupations. Additionally, their primary roles, historical and projected growth of industries for priority occupations, potential workforce challenges, and potential partners and programs that will enhance opportunities for priority communities are also shown. This information comes directly from the COE reports unless otherwise cited.

Common Challenges

Across all four primary industry sectors, there were occupations facing all three workforce challenge types including labor shortage, skill gaps, and retention and job quality issues.

A key finding in all sectors was a supply gap – the number of individuals completing regional training programs (e.g., degrees, certifications) was insufficient to meet projected job demand, with the supply gap being over 6,300 across all four sectors. Many occupations had zero qualified candidates graduating from community college programs in a related field, showing the need for more diverse academic offerings. Another common challenge across sectors was the advancement of technology and the need for basic digital literacy skills. This need for upskilling is affecting everyone from bus drivers to plumbers to farmers. Lastly, many occupations are experiencing job quality challenges that make retention difficult including low wages, difficult working conditions, and a lack of benefits, career advancement opportunities, and worker voice. As explained in the methodology, many occupations do not make the local living wage threshold of $22.12/hour for a single adult working full-time.

Cross-industry Opportunities

To address the three workforce challenge types, the MSA has existing federal, state, regional, and local partnerships and have created the following recruitment initiatives, upskilling and training programs, and high-road job creation pathways. Within each industry section below, there are additional enhanced partnership and program opportunities that the MSA could pursue to further address industry-specific workforce challenges.

Federal and State

America's Job Center of California (AJCC) in partnership with the Employment Development Department (EDD) offer free training services in partnership with local agencies including career counseling and job placement; access to apprenticeships and on-the-job training; and workshops and job fairs focused on sustainable and high-demand sectors.[174] AJCC and EDD also collaborated to create CalJOBS, a platform where job seekers can explore training programs, apprenticeships, and job openings. They offer California Training Benefits (CTB) which allow eligible unemployed individuals to receive benefits while attending training, increasing feasibility for priority communities to access critical education. The California Eligible Training Provider List (ETPL) includes approved training programs that are eligible for Workforce Innovation and Opportunity Act (WIOA) funding. These programs cover a wide range of fields, including clean energy, advanced manufacturing, and transportation. MSA residents can access these programs through CalJOBS.

Regional

WDBVC is actively engaged in High Road Training Partnerships (HRTPs) and related workforce initiatives aimed at improving job quality, retention, and accessibility. These partnerships, supported by the California Workforce Development Board (CWDB), emphasize collaboration between employers, labor unions, and community organizations to promote family-sustaining wages, safe working conditions, and career advancement opportunities. HRTPs often include union partners and local labor councils, helping to align training programs with real workplace needs and confirming that workers have a voice in shaping their employment conditions. In addition to State funding, the MSA benefits from the High Road Training Fund, a philanthropic initiative managed by Jobs for the Future (JFF), which provides financial support for wraparound services like housing and food assistance, as well as capacity-building for local training providers.[175] These efforts are particularly focused on sectors such as clean energy, logistics, and advanced manufacturing, and are designed to support workers from disadvantaged communities, including those in priority communities. Together, these partnerships represent a coordinated strategy to build a more resilient, inclusive, and sustainable workforce in the MSA.

Additional WDBCV workforce programs, as summarized in the 2025-2028 WDBVC Regional Plan, that the WDBVC has planned and implemented to achieve climate-neutral and resilience goals include[176]:

- Convening the WDBVC Clean Green Workgroup for over ten years to provide a forum for research, collaboration, and planning

---

[174] EDD. 2021. Job Search and Training Services. Accessed June 18, 2025, at: https://edd.ca.gov/siteassets/files/jobs_and_training/pubs/jobsearchandtrainingservicesfactsheet.pdf

[175] Jobs for the Future. 2025. Quality Jobs, Real Opportunities. Accessed June 18, 2025, at: https://www.jff.org/?hsCtaTracking=c8617a03-9c1e-43da-ba16-b3de243d9bc7%7C1b4f1c70-f500-4f66-aa95-bce9e18faa5d

[176] Workforce Development Board of Ventura County. 2025-2028 WDBVC Regional Plan. Accessed June 18, 2025, at: https://vcportal.ventura.org/wdb/workforce-plan/25-28_Regional_Plan.pdf

- Creating local green job opportunities through pursuing grants for the transition to active and public transportation, promoting clean energy and low-emissions logistics at the Port of Hueneme, exploring offshore wind projects, and setting aside funds for green construction training
- Preparing workers for emerging roles though intergenerational upskilling training programs and pre-apprenticeship programs like Climate First: Relacing Oil & Gas
- Creating centralized coordination for regional climate solutions by collaborating with the Sustainable Central Coast Regional Collaborative (SCCRC) to pool resources, share best practices, and align workforce development with regional climate objectives

SkillUp Ventura County is a free, online learning platform available to all MSA residents. It offers over 5,000 self-paced courses in areas such as manufacturing, logistics, digital literacy, and workplace readiness. While the program is open to the general public, it is designed to be especially accessible to individuals facing barriers to employment, including those from priority communities. The platform supports foundational and technical skill development aligned with in-demand occupations.[177]

The **Ventura County Digital Upskilling Training Program** provides no-cost, short-term training focused on improving digital literacy for job seekers, workers, and small business owners. The program includes instruction in productivity software, online collaboration tools, and basic digital certifications. It is intended to support individuals with limited access to technology or formal training, and is particularly relevant for residents of priority communities who may face systemic barriers to employment in tech-enabled or sustainable economy roles.[178]

Local

The City of Thousand Oaks demonstrates a commitment to workforce and employee development through its Human Resources Department, which focuses on attracting, developing, and retaining a skilled workforce. The city offers employee training, career development, health and safety programs, and fosters professional growth, teamwork, and diversity. External training, such as Cal-OSHA safety programs, is also available locally, serving both public and private sector employers seeking to meet evolving regulatory and industry needs within the city and surrounding area.[179],[180]

The City of Oxnard invests in a diverse range of workforce development efforts targeting both current employees and community members. Its Learning & Development Team delivers in-person and virtual training, supervisor bootcamps, and a wide array of on-demand professional development courses through platforms like Neogov Learn. The city is committed to boosting staff skills, supporting performance management, and building organizational capacity. For residents, Oxnard provides career resources, youth job training, and workforce readiness support—particularly through programs like Oxnard City Corps, which gives youth ages 12–25 paid opportunities to gain hands-on experience, explore careers, and develop valuable skills while serving their community. Oxnard also works with partner agencies to deliver accessible resources for jobseekers, including specialized assistance for veterans, people with disabilities, and older adults, as well as job training

---

[177] Skillup. 2025. Skillup Ventura County. Accessed June 18, 2025, at: https://venturacounty.skillupamerica.org/

[178] Economic Development Collaborative. 2025. Ventura County Digital Upskilling Training Program. Accessed June 18, 2025, at: https://digital-upskilling.edcollaborative.com/

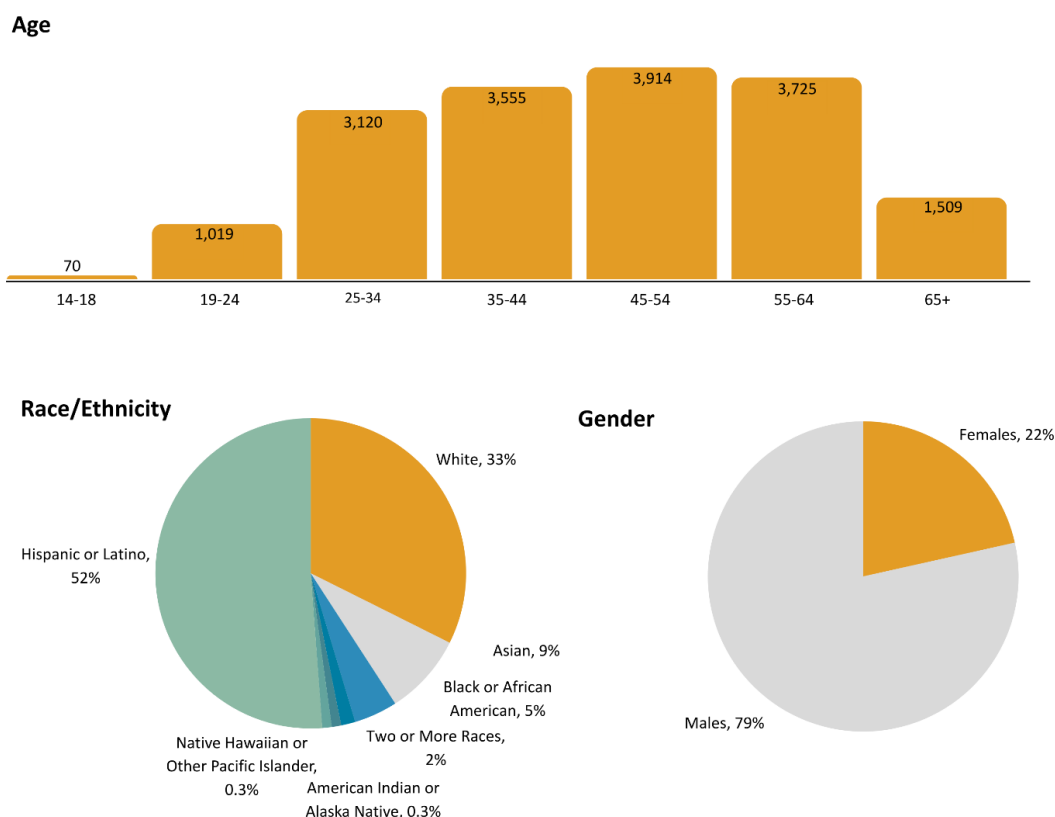[179] City of Thousand Oaks. 2025. Human Resources. Accessed June 18, 2025, at: https://toaks.gov/humanresources

[180] All Purpose Safety Training Solutions. 2025. Safety Training Thousand Oaks California. Accessed June 18, 2025, at: https://www.apsafetytrainingsolutions.com/locations/ca/safety-training-thousand-oaks-ca.php

for green construction and in-demand healthcare roles through organizations like the Center for Employment Training (CET).[181],[182],[183]

7.5.1　Advanced Manufacturing

Jobs in the Advanced Manufacturing sector include a total of 12 occupations which are summarized along with industry trends and relevant CCAP Strategies in Table 50. In the MSA, it is anticipated that the number of clean/green jobs within the Advanced Manufacturing sector will remain steady for five of the occupations, while the remaining seven are anticipated to see an increase. Age, race/ethnicity, and gender breakdowns for employees within this sector are highlighted in Figure 12.

Figure 12 Oxnard-Thousand Oaks-Ventura MSA Advanced Manufacturing by Age, Race/Ethnicity, and Gender

Age

Age group	Count
14-18	70
19-24	1,019
25-34	3,120
35-44	3,555
45-54	3,914
55-64	3,725
65+	1,509

Race/Ethnicity

- White, 33%
- Hispanic or Latino, 52%
- Asian, 9%
- Black or African American, 5%
- Two or More Races, 2%
- Native Hawaiian or Other Pacific Islander, 0.3%
- American Indian or Alaska Native, 0.3%

Gender

- Females, 22%
- Males, 79%

Source: COE. 2024. Clean/Green Jobs Advanced Manufacturing, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

---

[181] City of Oxnard. 2025. Learning & Development. Accessed June 18, 2025, at: https://www.oxnard.gov/human-resources/employee-resources/learning-development

[182] City of Oxnard. 2025. City Corps. Accessed June 18, 2025, at: https://www.oxnard.gov/cultural-community-services/recreation-community-services/city-corps

[183] Center for Employment Training. 2025. Training programs available in Oxnard, CA. Accessed June 18, 2025, at: https://cetweb.edu/location/oxnard-ca

In 2022, there were 121 regional completions in programs related to the clean/green occupations identified as aligned with Advanced Manufacturing and 1,738 openings, indicating an undersupply and supply gap of 1,617 for the clean/green jobs within this sector. The labor shortage, skill gaps, and retention and job quality issues are shown in Table 51.

Table 50 Oxnard-Thousand Oaks-Ventura MSA Advanced Manufacturing Related Occupations and Industry Trends

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Engineers, All Other	Engineers not listed separately.	N/A	552	Anticipated to remain steady (4%)	Building Energy, Water and Wastewater
Electrical and Electronic Engineering Technologists and Technicians	Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, adjust, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions.	N/A	580	Anticipated to remain steady (-2%)	Building Energy, Transportation and Mobility, Water and Wastewater
Industrial Engineering Technologists and Technicians	Apply engineering theory and principles to problems of industrial layout or manufacturing production, usually under the direction of engineering staff. May perform time and motion studies on worker operations in a variety of industries for purposes such as establishing standard production rates or improving efficiency.	Industrial Engineering Analyst, Quality Control Engineering Technician, Service Technician	111	Anticipated to increase (13%)	Transportation and Mobility, Waste Management, Water and Wastewater
Electric Motor, Power Tool, and Related Repairers	Repair, maintain, or install electric motors, wiring, or switches.	Electric Motor Mechanic, Repair Technician	29	Anticipated to increase (7%)	Building Energy, Transportation and Mobility, Agriculture and NWLs
Maintenance and Repair Workers, General	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.	Building Mechanic, Facilities Technician, Maintenance Specialist	2,673	Anticipated to increase (9%)	Building Energy
First-Line Supervisors of Production and	Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and	Assembly Supervisor, Plant Supervisor,	1,161	Anticipated to increase (8%)	Building Energy, Transportation and Mobility, Waste

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Operating Workers	operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.	Production Manager			Management, Water and Wastewater
Miscellaneous Assemblers and Fabricators	All assemblers and fabricators not listed separately.	N/A	3,941	Anticipated to remain steady (-2%)	Waste Management, Water and Wastewater
Machinists	Set up and operate a variety of machine tools to produce precision parts and instruments out of metal. Includes precision instrument makers who fabricate, modify, or repair mechanical instruments. May also fabricate and modify parts to make or repair machine tools or maintain industrial machines, applying knowledge of mechanics, mathematics, metal properties, layout, and machining procedures.	Machine Repair Person, Machinist, Maintenance Machinist,	943	Anticipated to increase (6%)	Building Energy, Transportation and Mobility, Water and Wastewater
Inspectors, Testers, Sorters, Samplers, and Weighers	Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.	Quality Assurance Auditor (QA Auditor), QA Inspector, QA Technician,	1,406	Anticipated to remain steady (3%)	Waste Management
Production Workers, All Other	All production workers not listed separately.	N/A	869	Anticipated to remain steady (2%)	Building Energy, Waste Management
Heavy and Tractor-Trailer Truck Drivers	Drive a tractor-trailer combination or a truck with a capacity of at least 26,001 pounds Gross Vehicle Weight (GVW). May be required to unload truck. Requires commercial drivers' license. Includes tow truck drivers.	Truck Driver	3,156	Anticipated to increase (10%)	Building Energy, Transportation and Mobility, Waste Management, Agriculture and NWLs
Industrial Truck and Tractor Operators	Operate industrial trucks or tractors equipped to move materials around a warehouse, storage yard, factory, construction site, or similar location.	Forklift Technician, Forklift Driver, Truck Driver	1,676	Anticipated to increase (9%)	Building Energy, Transportation and Mobility, Waste Management, Agriculture and NWLs

Notes: N/A = not applicable.

Source: COE. 2024. Clean/Green Jobs Advanced Manufacturing, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Table 51 Oxnard-Thousand Oaks-Ventura MSA Advanced Manufacturing Potential Workforce Challenges

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Engineers, All Other	118	32	Anticipated to remain steady (4%)	Bachelor's Degree	Moderate: Automation, AI, sustainability	$47.94	Low	Burnout, little diversity	N/A
Electrical and Electronic Engineering Technologists and Technicians	3	56	Anticipated to remain steady (-2%)	Associate's Degree	Moderate: Programmable logic controllers (PLCs), digital systems, and advanced diagnostics	$46.63	Medium	Exposure to noise or electrical hazards, limited worker voice	
Industrial Engineering Technologists and Technicians	3	10	Anticipated to increase (13%)	Associate's Degree	Moderate: Lean manufacturing, Six Sigma, and digital tools like CAD/CAM and simulation software	$30.84	Low	Exposure to noise or electrical hazards, limited career advancement	
Electric Motor, Power Tool, and Related Repairers	0	2	Anticipated to increase (7%)	High School Diploma or Equivalent + Additional Training	Moderate: Advanced electric motors (e.g., in EVs or smart tools)	$24.24	High	Dangerous working conditions and physical strain, limited benefits	
Maintenance and Repair Workers, General	0	262	Anticipated to increase (9%)	High School Diploma or Equivalent + Additional Training	High: Smart building systems (sensors, diagnostics, digital platforms)	$22.91	High	Dangerous working conditions and physical strain, limited advancement	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
First-Line Supervisors of Production and Operating Workers	0	110	Anticipated to increase (8%)	High School Diploma or Equivalent + Additional Training	Moderate: Digital literacy	$30.85	Low	N/A	
Miscellaneous Assemblers and Fabricators	0	418	Anticipated to remain steady (-2%)	High School Diploma or Equivalent + Additional Training	High: Robotics repair and troubleshooting	$17.31	High	Long hours standing, exposure to noise, limited worker voice	
Machinists	0	101	Anticipated to increase (6%)	High School Diploma or Equivalent + Additional Training	High: CNC programming, CAD/CAM software, and precision measurement tools	$23.92	High	Exposure to noise, and risk of injury from machinery, often non-unionized, limited benefits	
Inspectors, Testers, Sorters, Samplers, and Weighers	0	160	Anticipated to remain steady (3%)	High School Diploma or Equivalent + Additional Training	Moderate: Automated inspection systems and digital quality control tools	$21.73	High	N/A	
Production Workers, All Other	0	96	Anticipated to remain steady (2%)	High School Diploma or Equivalent + Additional Training	High: Robotics repair and troubleshooting	$17.02	High	Limited worker voice	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Heavy and Tractor-Trailer Truck Drivers	0	328	Anticipated to increase (10%)	Postsecondary Nondegree Award	Moderate: Telematics, electric trucks, and logistics software	$23.76	High	Long hours, physical strain, limited benefits	
Industrial Truck and Tractor Operators	0	163	Anticipated to increase (9%)	No Formal Education Credential	Moderate: Automated warehouse systems and digital inventory tools	$19.00	High	Risk of injury from machinery, limited advancement opportunities	

Notes: N/A = not applicable. Hourly Wage cells shown in red represent occupations that fall below the local living wage threshold of $22.12/hour for a single adult working full-time.

Source: COE. 2024. Clean/Green Jobs Advanced Manufacturing, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Graduates of community college programs in the MSA that align with Advanced Manufacturing and are prepared for the selected clean/green jobs in this sector, from the 2019-2020 academic year, had a median annual wage upon completion of $40,954. Within this sector, 64 percent of students are employed within a year after completing a program; 72 percent of students were part-time, 19 percent skill builders, 42 percent first-generation, and 72 percent economically disadvantaged. In 2022, the top employers hiring professionals in the Advanced Manufacturing field include Aerotek (332 job postings), Belcan (211 job postings), and Amgen (187 job postings).

Of the three workforce challenges, the Advanced Manufacturing industry experiences labor shortages requiring recruiting initiatives and apprenticeships, skills gaps requiring upskilling and training programs, and retention and job quality issues requiring a transition to high-road jobs.

Recruitment Initiatives to Combat Labor Shortages

There are three community colleges and two universities in the MSA including Ventura College, Moorpark College, Oxnard College, California Lutheran University, and California State University - Channel Islands, that currently facilitate programs to train qualified candidates within the Advanced Manufacturing sector. These programs include:

- Pre-Engineering (Classification of Instructional Programs [CIP] Code: 14.0102)
- Engineering, Other (CIP Code: 14.9999)
- Engineering Technologies/Technicians, General (CIP Code: 15.0000)

In considering this combination of clean/green jobs within Advanced Manufacturing and the supply gap for many of these professions, the following programs were identified to fill the gap if these programs were to open at community colleges and universities across the MSA.

- Manufacturing Engineering Technology/Technician (CIP Code: 15.0613)
- Quality Control Technology/Technician (CIP Code: 15.0702)
- Mechanical/Mechanical Engineering Technology/Technician (CIP Code: 15.0805)
- Electrical/Electronics Equipment Installation and Repair Technology/Technician, General (CIP Code: 47.0101)
- Machine Tool Technology/Machinist (CIP Code: 48.0501)
- Machine Shop Technology/Assistant (CIP Code: 48.0503)
- Truck and Bus Driver/Commercial Vehicle Operator and Instructor (CIP Code: 49.0205)

Additionally, the Apprenticeship Innovation Funding (AIF) provides critical funding and reimbursement to apprenticeship program partners and local education agencies for the costs of running those programs and training apprentices. The AIF funds programs specifically in advanced manufacturing and includes $52 million for the fiscal year of 2024-2025.[184]

---

[184] Department of Industrial Relations. 2025. Apprenticeship Innovation Funding. Accessed June 18, 2025, at: https://www.dir.ca.gov/DAS/Grants/Apprenticeship-Innovation-Funding.html

Upskilling and Training Programs to Combat Skill Gaps

General workforce resources and training programs are listed in the Key Findings from Primary Industry Sectors section. Baseline, specialized, and software skills desired in this sector in 2022 include:

- **Baseline skills:** Communication, Operations, Troubleshooting (Problem Solving), Management, Customer Service, Lifting Ability, Detail Oriented, Problem Solving, Good Driving Record, English Language
- **Specialized skills:** Hand Tools, Good Manufacturing Practices, Machinery, Plumbing, Truck Driving, Painting, Auditing, Warehousing, Forklift Truck, Machining
- **Software skills:** Microsoft Excel, Microsoft Office, LESS, Microsoft Outlook, Software Systems, Microsoft Word, Microsoft PowerPoint, SAP Applications, SolidWorks (CAD), Operating Systems

High-Road Jobs to Combat Retention and Job Quality Issues

General workforce resources and partners to advance high-road jobs are listed in the Key Findings from Primary Industry Sectors section. Some specific unions that the HRTP could collaborate with include: International Brotherhood of Electrical Workers (IBEW) Local 952: represents Electricians, Electrical Apprentices, Communications and Systems Installers, Transportation Systems Journeyman, Construction Wireman and Construction Electricians across manufacturing, construction, and clean technology sectors.[185]

7.5.2 Advanced Transportation and Logistics

Jobs in the Advanced Transportation and Logistics sector include a total of seven occupations, with various sample job titles including Client Services Managers, Receivers, Automotive Mechanics, Bicycle Mechanics, Bus Drivers, and Dock Workers, among others. These occupations are summarized along with industry trends and relevant CCAP Strategies in Table 52. In the MSA, it is anticipated that the number of clean/green jobs within the Advanced Transportation and Logistics sector will remain steady for three of the occupations, while the remaining four are expected to see an increase. Age, race/ethnicity, and gender breakdowns for employees within this sector are highlighted in Figure 13.

---

[185] IBEW Local 952. 2025. Accessed June 18, 2025, at: https://www.ibewlu952.org/

Figure 13 Oxnard-Thousand Oaks-Ventura MSA Advanced Transportation and Logistics by Age, Race/ Ethnicity, and Gender
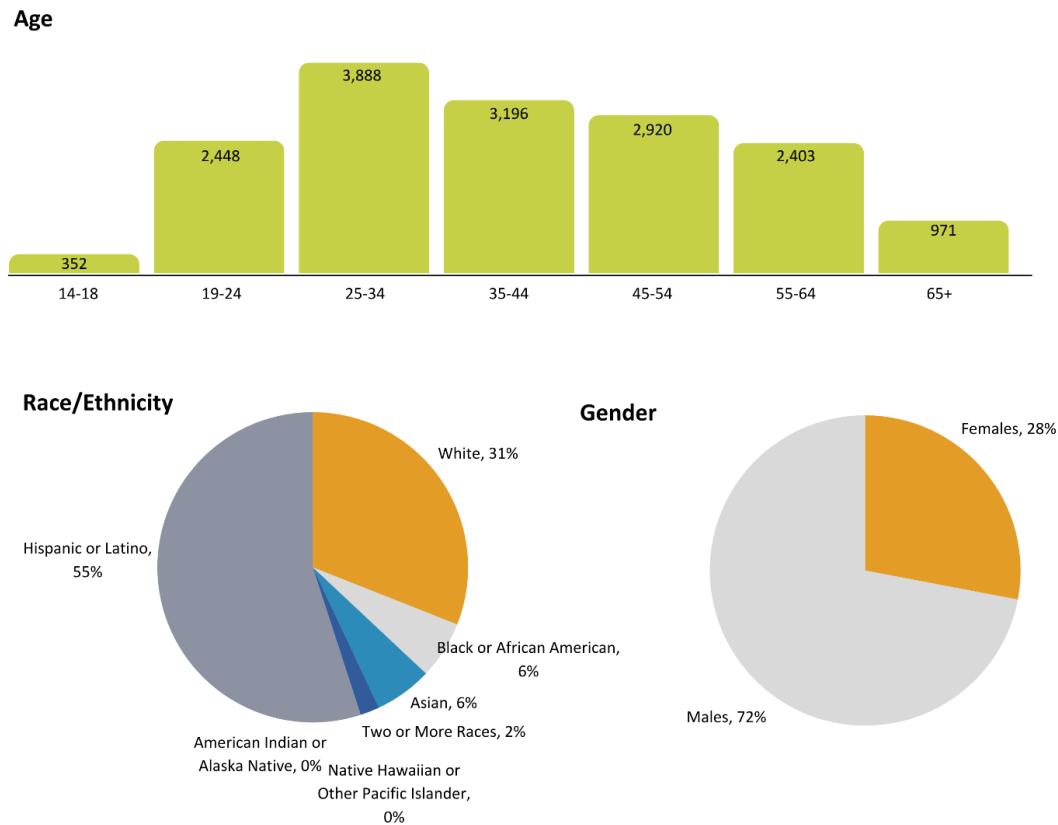
Age

Age group	Value
14-18	352
19-24	2,448
25-34	3,888
35-44	3,196
45-54	2,920
55-64	2,403
65+	971

Race/Ethnicity

- Hispanic or Latino, 55%
- White, 31%
- Black or African American, 6%
- Asian, 6%
- Two or More Races, 2%
- American Indian or Alaska Native, 0%
- Native Hawaiian or Other Pacific Islander, 0%

Gender

- Females, 28%
- Males, 72%

Source: COE. 2024. Clean/Green Jobs Advanced Transportation and Logistics, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

In 2022, there were 134 regional completions in programs related to the clean/green occupations identified as aligned with Advanced Transportation and Logistics and 2,255 openings, indicating an undersupply and supply gap of 2,121 for the clean/green jobs within this sector. The labor shortage, skill gaps, retention, and job quality issues are shown in Table 53.

Table 52 Oxnard-Thousand Oaks-Ventura MSA Advanced Transportation and Logistics Related Occupations and Industry Trends

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Logisticians	Analyze and coordinate the ongoing logistical functions of a firm or organization. Responsible for the entire life cycle of a product, including acquisition, distribution, internal allocation, delivery, and final disposal of resources.	Client Services Administrator, Supply Management Specialist	974	Anticipated to increase (11%)	Transportation and Mobility, Waste Management
Shipping, Receiving, and Inventory Clerks	Verify and maintain records on incoming and outgoing shipments involving inventory. Duties include verifying and recording incoming merchandise or material and arranging for the transportation of products. May prepare items for shipment.	Receiver, Shipper, Traffic Assistant	2,049	Anticipated to remain steady (-1%)	Transportation and Mobility, Waste Management
Automotive Service Technicians and Mechanics	Diagnose, adjust, repair, or overhaul automotive vehicles.	Automotive Mechanics, Automotive Technician, Service Technician	1,674	Anticipated to remain steady (3%)	Transportation and Mobility
Bicycle Repairers	Repair and service bicycles.	Bicycle Fitter, Bicycle Mechanic	39	Anticipated to increase (10%)	Transportation and Mobility
Bus Drivers, Transit, and Intercity	Drive bus or motor coach, including regular route operations, charters, and private carriage. May assist passengers with baggage. May collect fares or ticket.	Bus Driver, Coach Operator, Transit Bus Driver	266	Anticipated to remain steady (3%)	Transportation and Mobility
Laborers and Freight, Stock, and Material Movers, Hand	Manually move freight, stock, luggage, or other materials, or perform other general labor. Includes all manual laborers not elsewhere classified.	Dock Worker, Line Tender, Warehouse Worker	5,595	Anticipated to increase (7%)	Transportation and Mobility, Waste Management
Stockers and Order Fillers	Receive, store, and issue merchandise, materials, equipment, and other items from stockroom, warehouse, or storage yard to fill shelves, racks, tables, or customers' orders. May operate power equipment to fill orders. May mark prices on merchandise and set up sales displays.	Checker Stocker, Inventory Specialist	5,581	Anticipated to increase (7%)	N/A

Notes: N/A = not applicable.

Source: COE. 2024. Clean/Green Jobs Advanced Transportation and Logistics, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Table 53 Oxnard-Thousand Oaks-Ventura MSA Advanced Transportation and Logistics Potential Workforce Challenges and Opportunities

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Logisticians	0	94	Anticipated to increase (11%)	Bachelor's Degree	Moderate: Supply chain analytics, logistics software (e.g., SAP, Oracle), and AI-driven forecasting tools	$46.72	Low	N/A	
Shipping, Receiving, and Inventory Clerks	0	204	Anticipated to remain steady (-1%)	High School Diploma or Equivalent + Additional Training	Some: Warehouse management systems, barcode scanners, and inventory software	$18.25	High	Exposure to warehouse hazards	
Automotive Service Technicians and Mechanics	134	152	Anticipated to remain steady (3%)	Postsecondary Non-Degree Award	High: Electric vehicles (EVs), hybrid systems, and advanced diagnostics	$26.05	High	Tool costs, safety hazards, physical strain, limited advancement opportunities	
Bicycle Repairers	0	5	Anticipated to increase (10%)	High School Diploma or Equivalent + Additional Training	Moderate: E-bike servicing, smart components	$20.49	High	Seasonal demand, limited formal advancement opportunities or worker voice	
Bus Drivers, Transit, and Intercity	0	56	Anticipated to remain steady (3%)	High School Diploma or Equivalent + Additional Training	Some: EV buses, digital fare systems	$25.75	Medium	Long hours, limited flexibility, often unionized but staffing shortages	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Laborers and Freight, Stock, and Material Movers, Hand	0	762	Anticipated to increase (7%)	No Formal Education Credential + Additional Training	Some: Automated material handling systems and digital inventory tools	$17.42	High	Exposure to warehouse hazards, physical strain; limited benefits or advancement	
Stockers and Order Fillers	0	982	Anticipated to increase (7%)	High School Diploma or Equivalent + Additional Training	Some: automated stocking systems, digital order platforms	$17.20	High	Night shifts, physical strain	

Notes: N/A = not applicable. Hourly Wage cells shown in red represent occupations that fall below the local living wage threshold of $22.12/hour for a single adult working full-time.

Source: COE. 2024. Clean/Green Jobs Advanced Transportation and Logistics, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Graduates of community college programs in the MSA that align with Advanced Transportation and Logistics and are prepared for the selected clean/green jobs in this sector, from the 2019-2020 academic year, had a median annual wage upon completion of $30,688. Within this sector, 61 percent of students are employed within a year after completing a program; 74 percent of students were part-time, 22 percent skill builders, 49 percent first-generation, and 84 percent economically disadvantaged. In 2022, the top employers hiring staff for the Advanced Technology and Logistics sector were Amazon (281 job postings), Aerotek (89 job postings), Walmart (eight job postings), Sprouts Farmers Market (84 job postings), and the United Postal Service (UPS, 83 job postings).

Of the three workforce challenges, the Advanced Transportation and Logistics industry experiences labor shortages requiring recruiting initiatives and apprenticeships, skills gaps requiring upskilling and training programs, and retention and quality issues requiring a transition to high-road jobs.

Recruitment Initiatives to Combat Labor Shortages

There are two community colleges, including Ventura College and Oxnard College, that currently facilitate programs to train qualified candidates within the Advanced Transportation and Logistics sector. The programs at each college include:

- Automobile/Automotive Mechanics Technology/Technician (CIP Code: 47.0604)
- Diesel Mechanics Technology/Technician (CIP Code: 47.0605)
- Autobody/Collision and Repair Technology/Technician (CIP Code: 47.0603)

In considering this combination of clean/green jobs within Advanced Transportation and Logistics and the supply gap for many of these professions, the following programs were identified to fill the gap if these programs were to open up at community colleges and universities across the MSA.

- Automobile/Automotive Mechanics Technology/Technician (CIP Code: 47.0604)
- Truck and Bus Driver/Commercial Vehicle Operator and Instructor (CIP Code: 49.0205)
- Logistics, Materials, and Supply Chain Management (CIP Code: 52.0203)
- Diesel Mechanics Technology/Technician (CIP Code: 47.0605)
- Project Management (CIP Code: 52.0211)
- General Office Occupations and Clerical Services (CIP Code: 52.0408)
- Autobody/Collision and Repair Technology/Technician (CIP Code: 47.0603)
- Purchasing, Procurement/Acquisitions and Contracts Management (CIP Code: 52.0202)
- Alternative Fuel Vehicle Technology/Technician (CIP Code: 47.0614)
- Operations Management and Supervision (CIP Code: 52.0205)
- Automotive Engineering Technology/Technician (CIP Code: 15.0803)
- Ground Transportation, Other (CIP Code: 49.0299)
- Transportation/Mobility Management (CIP Code: 52.0209)
- Vehicle Emissions Inspection and Maintenance Technology/Technician (CIP Code: 47.0612)

Upskilling and Training Programs to Combat Skill Gaps

General workforce resources and training programs are listed in the Key Findings from Primary Industry Sectors section. Baseline, specialized, and software skills desired in this sector in 2022 include:

- Baseline skills: Customer Service, Lifting Ability, Communication, Management, Loading and Unloading, Detail Oriented, Operations, Hand Trucks, Good Driving Record, Packaging and Labeling
- Specialized skills: Warehousing, Merchandising, Forklift Truck, Palletizing, Shipping and Receiving, Pallet Jacks, Inventory Management, Inventory Control, Cycle Counting, Stocking Merchandise
- Software skills: Microsoft Excel, LESS, Microsoft Office, Microsoft Outlook, Inventory Management System, Microsoft PowerPoint, SAP Applications, Microsoft Word, Microsoft Access, Software Systems

High-Road Jobs to Combat Retention and Job Quality Issues

General workforce resources and partners to advance high-road jobs are listed in the Key Findings from Primary Industry Sectors section. Some specific unions that the HRTP could collaborate with include:

- Local 186 Teamsters: represent truck drivers, warehouse workers, and logistics personnel throughout Southern California, including the MSA. They also represent supervisors, as well as demand response dispatchers and reservationists at Gold Coast Transit District (GCTD). [186]
- Service Employees International Union (SEIU) Local 721: represents all bus operators, most maintenance employees, and administrative staff at GCTD.[187]

7.5.3 Energy, Construction, and Utilities

Jobs in the Energy, Construction, and Utilities sector include a total of 14 occupations, with various sample job titles including Construction Manager, Carpenters, Construction Workers, Electricians, among others. These occupations are summarized along with industry trends and relevant CCAP Strategies in Table 54. In the MSA, it is anticipated that the number of clean/green jobs within the Energy, Construction, and Utilities sector are expected to remain steady for five of the occupations, increase for eight occupations, and has insufficient data for one occupation. Age, race/ethnicity, and gender breakdowns for employees within this sector are highlighted in Figure 14.

---

[186] Teamsters Local 186. 2025. Accessed June 18, 2025, at: https://www.teamsterslocal186.org/

[187] GCTD. 2022. GCTD Employees' Union Finalize New Contract. Accessed June 18, 2025, at: https://www.gctd.org/gctd-employees-union-finalize-new-contract/

Figure 14 Oxnard-Thousand Oaks-Ventura MSA Energy, Construction, and Utilities by Age, Race/ Ethnicity, and Gender
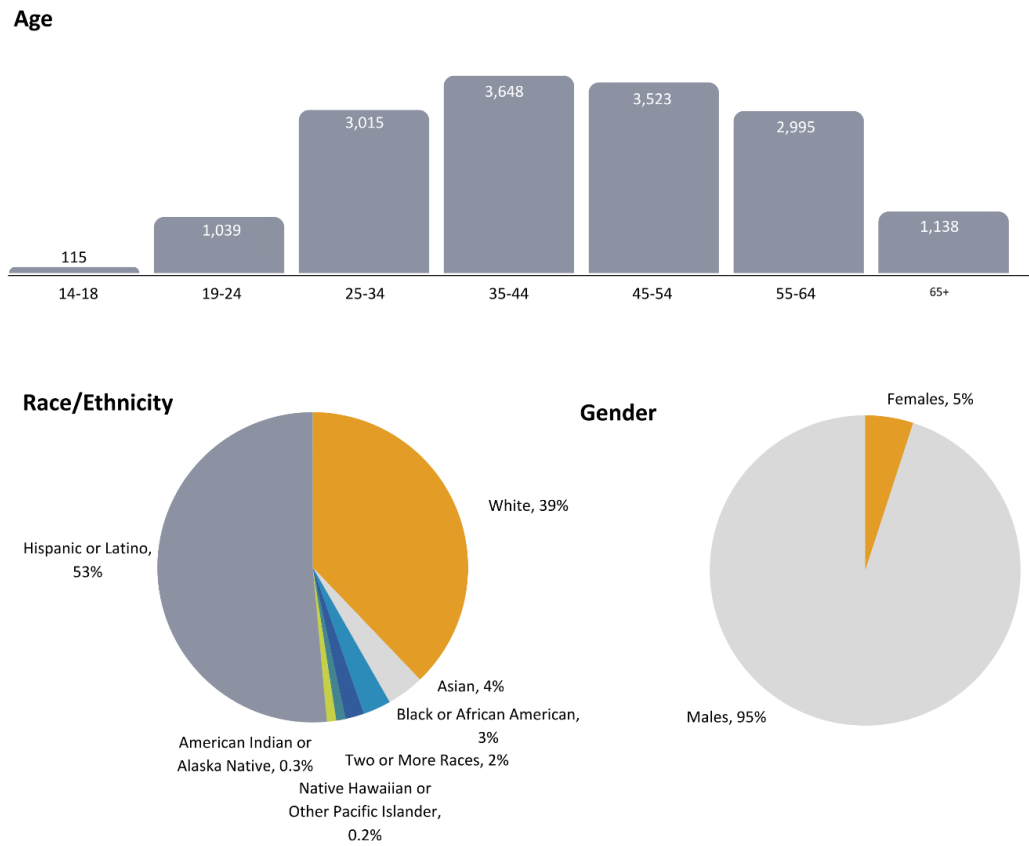
Source: COE. 2024. Clean/Green Jobs Energy, Construction, and Utilities, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

In 2022, there were 92 regional completions in programs related to the clean/green occupations identified as aligned with Energy, Construction, and Utilities and 1,391 openings, indicating an undersupply and supply gap of 1,299 for the clean/green jobs within this sector. The labor shortage, skill gaps, retention and job quality issues are shown in Table 55.[188]

---

[188] Number of occupations, job growth, regional program completions, regional job openings, and supply gap have all been modified to remove occupations that are non-relevant to CCAP Strategies. Industry-level data in the following paragraph and demographic data in **Error! Reference source not found.** includes the four occupations (Nuclear Technicians; Earth Drillers; Except Oil and Gas; and Welders, Cutters, Solderers, and Brazers) that were deleted from the analysis. See Section 7.4 for further explanation of this deletion.

Table 54 Oxnard-Thousand Oaks-Ventura MSA Energy, Construction, and Utilities Related Occupations and Industry Trends

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Construction Managers	Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, budgeting, and implementation. Includes managers in specialized construction fields, such as carpentry or plumbing.	Construction Manager, Construction Foreman, Job Superintendent	1,229	Anticipated to increase (6%)	Building Energy, Transportation and Mobility
Architectural and Civil Drafters	Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings.	N/A	218	Anticipated to remain steady (1%)	Building Energy, Transportation and Mobility
Carpenters	Construct, erect, install, or repair structures and fixtures made of wood and comparable materials, such as concrete forms; building frameworks, including partitions, joists, studding, and rafters; and wood stairways, window and door frames, and hardwood floors. May also install cabinets, siding, drywall, and batt or roll insulation. Includes brattice builders who build doors or brattices (ventilation walls or partitions) in underground passageways.	Bridge Carpenter, Cabinet Maker, Concrete Carpenter, Framer	3,432	Anticipated to remain steady (1%)	Building Energy, Agriculture and NWLs
Construction Laborers	Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, and clean up rubble, debris, and other waste materials. May assist other craft workers.	Construction Worker, Equipment Operator, Scaffolding Operator, Site Work Laborer	3,041	Anticipated to remain steady (4%)	Building Energy, Transportation and Mobility, Waste Management

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Electrician	Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems.	Control Electrician, Electrical Journey Person, Electrician	1,298	Anticipated to increase (8%)	Building Energy, Transportation and Mobility, Water and Wastewater
Plumbers, Pipefitters, and Steamfitters	Assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, or other liquids or gases. May install heating and cooling equipment and mechanical control systems. Includes sprinkler fitters.	Pipe Welder, Plumber, Steamfitter, Pipefitter	1,179	Anticipated to increase (11%)	Building Energy, Water and Wastewater
Solar Photovoltaic Installers	Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks.	PV Installer, Solar Technician, PV Design Technician	135	Anticipated to increase (10%)	Building Energy, Agriculture and NWLs
Helper, Construction Trades, All Other	All construction trades helpers not listed separately.	N/A	75	Anticipated to remain steady (3%)	Building Energy, Transportation and Mobility, Waste Management, Agriculture and NWLs
Construction and Building Inspectors	Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.	Building Inspection Engineer, Building Inspector, Building Official, Code Enforcement Officer	289	Anticipated to remain steady (3%)	Building Energy, Transportation and Mobility, Agriculture and NWLs
Septic Tank Services and Sewer Pipe Cleaners	Clean and repair septic tanks, sewer lines, or drains. May patch walls and partitions of tank, replace damaged drain tile, or repair breaks in underground piping.	Drain Technician, Public Works Technician, Septic Cleaner, Septic Pump Truck Driver, Septic Tank Service Technician	75	Anticipated to increase (13%)	Building Energy, Water and Wastewater, Agriculture and NWLs
Heating, Air Conditioning, and Refrigeration	Install or repair heating, central air conditioning, HVAC, or refrigeration systems, including oil burners, hot-air furnaces, and heating stoves.	HVAC Installer, Refrigeration Mechanic and Operator, Service Technician	908	Anticipated to increase (13%)	Building Energy

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Mechanics and Installers					
Maintenance and Repair Workers, General	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs.	Building Mechanic, Equipment Engineering Technician	2,673	Anticipated to increase (9%)	Building Energy
Wind Turbine Service Technicians	Inspect, diagnose, adjust, or repair wind turbines. Perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions.	Field Service Technician, Renewable Energy Technician, Service Technician	24	Anticipated to increase (13%)	Building Energy, Water and Wastewater, Agriculture and NWLs
Power Distributors and Dispatch	Coordinate, regulate, or distribute electricity or steam.	Control Operator, Distribution, Dispatcher, Distribution System, Operator, Electric System, Operator	<10	Insufficient data	Building Energy, Water and Wastewater

Notes: N/A = not applicable.

Source: COE. 2024. Clean/Green Jobs Energy, Construction, and Utilities, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Table 55 Oxnard-Thousand Oaks-Ventura MSA Energy, Construction, and Utilities Potential Workforce Challenges

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Construction Managers	15	100	Anticipated to increase (6%)	Bachelor's Degree	Moderate: PM software, green building standards, energy-efficient design	$40.66	Low	High stress and long hours	
Architectural and Civil Drafters	48	20	Anticipated to remain steady (1%)	Associate's Degree	Low	$25.97	Low	Limited career advancement	N/A
Carpenters	15	300	Anticipated to remain steady (1%)	High School Diploma or Equivalent + Additional Training	High: Green construction, pre-fabrication,	$27.65	High	Seasonal work, physical strain	
Construction Laborers	15	279	Anticipated to remain steady (4%)	No Formal Education Credential	Moderate: automated tools, digital site plans, safety tech	$21.05	High	Seasonal work, physical strain, exposure to hazards, inconsistent work schedules	
Electrician	0	132	Anticipated to increase (8%)	High School Diploma or Equivalent + Additional Training	High: Solar, EV infrastructure, smart grid systems	$28.89	High	Exposure to electrical hazards, aging workforce	
Plumbers, Pipefitters, and Steamfitters	0	118	Anticipated to increase (11%)	High School Diploma or Equivalent + Additional Training	High: green plumbing systems, water conservation tech, HVAC integration	$28.56	High	Physically demanding	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Helper, Construction Trades, All Other	0	9	Anticipated to remain steady (3%)	No Formal Education Credential	Low	$21.46	High	Physical strain, often non-unionized, limited formal advancement	
Construction and Building Inspectors	29	34	Anticipated to remain steady (3%)	High School Diploma or Equivalent + Additional Training	Moderate: evolving building codes	$42.72	Low	Aging workforce	
Septic Tank Services and Sewer Pipe Cleaners	0	11	Anticipated to increase (13%)	High School Diploma or Equivalent + Additional Training	Low	$21.91	High	Physical strain, often non-unionized, limited formal advancement	
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	6	95	Anticipated to increase (13%)	Postsecondary Nondegree Award	High: panel upgrades, smart thermostats, refrigerants	$27.89	High	Physical strain	
Maintenance and Repair Workers, General	21	290	Anticipated to increase (9%)	High School Diploma or Equivalent + Additional Training	High: Smart building systems, IoT-enabled equipment, energy-efficient technologies	$22.91	High	Physical strain, limited career advancement	
Wind Turbine Service Technicians	0	3	Anticipated to increase (13%)	Postsecondary Nondegree Award	N/A	$32.53	High	Physical strain, exposure to hazards, limited union presence or advancement	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Risk of Automation	Other Challenges	Workforce Challenge Type
Power Distributors and Dispatch	0	2	Insufficient data	High School Diploma or Equivalent + Additional Training	High: advanced turbine technology, remote diagnostics, predictive maintenance	Insufficient data	Low	Irregular hours, high-stress	Insufficient data

Notes: N/A = not applicable. Hourly Wage cells shown in red represent occupations that fall below the local living wage threshold of $22.12/hour for a single adult working full-time.

Source: COE. 2024. Clean/Green Jobs Energy, Construction, and Utilities, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Graduates of community college programs in the MSA that align with Energy, Construction, and Utilities, and are preparing students for the selected clean/green jobs in this sector, from the 2019-2020 academic year, had a median annual wage upon completion of $44,628. Within this sector, 71 percent of students are employed within a year after completing a program; 79 percent of students were part-time, 29 percent skill builders, 44 percent first-generation, and 72 percent economically disadvantaged. In 2022, the top employers hiring staff for the Energy, Construction, and Utilities sector were Brightview (44 job postings), Hawx Services (24 job postings), City of Oxnard (17 job postings), State of California (13 job postings), Orkin (12 job postings), Bayer (11 job postings), Aerotek (11 job postings), Actalent (10 job postings), and Oneida Esc. Group ([Oesc], 10 job postings).

Of the three workforce challenges, the Energy, Construction, and Utilities industry experiences labor shortages requiring recruiting initiatives and apprenticeships, skills gaps requiring upskilling and training programs, and retention and job quality issues requiring a transition to high-road jobs.

Recruitment Initiatives to Combat Labor Shortages

There are three community colleges, including Ventura College, Moorpark College, Oxnard College, as well as CET-Oxnard and California Lutheran University, that currently facilitate programs to train qualified candidates within the Energy, Construction, and Utilities sector. These programs include:

- Physics, General (CIP Code: 40.0801)
- Drafting and Design Technology/Technician, General (CIP Code: 15.1301)
- Building Construction Technology/Technician (CIP Code: 46.0415)
- Building/Home/Construction Inspection/Inspector (CIP Code: 46.0403)
- Welding Technology/Welder (CIP Code: 46.0508)
- Building/Construction Site Management/Manager (CIP Code: 46.0412)
- Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician (CIP Code: 15.0501)
- Engineering Technologies/Technicians, General (CIP Code: 15.0000)

In considering this combination of clean/green jobs within Energy, Construction, and Utilities and the supply gap for many of these professions, the following programs were identified to fill the gap if these programs were to open at community colleges and universities across the MSA.

- Architectural and Building Sciences/Technology (CIP Code: 04.0902)
- Manufacturing Engineering Technology/Technician (CIP Code: 15.0613)
- Energy Systems Technology/Technician (CIP Code: 15.1701)
- Carpentry/Carpenter (CIP Code: 46.0201)
- Electrical and Power Transmission Installation/Installer, General (CIP Code: 46.0301)
- Electrician (CIP Code: 46.0302)
- Plumbing Technology/Plumber (CIP Code: 46.0503)
- Construction Trades, Other (CIP Code: 46.9999)
- Industrial Mechanics and Maintenance Technology/Technician (CIP Code: 47.0303)
- Construction/Heavy Equipment/Earthmoving Equipment Operation (CIP Code: 49.0202)

Upskilling and Training Programs to Combat Skill Gaps

General workforce resources and training programs are listed in the Key Findings from Primary Industry Sectors section. Baseline, specialized, and software skills desired in this sector in 2022 include:

- Baseline skills: Communication, Customer Service, Troubleshooting (Problem Solving), Management, Operations, Lifting Ability, Good Driving Record, Detail Oriented, Problem Solving, Self-Motivation
- Specialized skills: Plumbing, HVAC, Construction, Carpentry, Painting, Hand Tools, Preventive Maintenance, Project Management, Power Tool Operation, Drywall (Installation and Repair)
- Software skills: Microsoft Office, Microsoft Excel, Microsoft Outlook, LESS, Microsoft Word, Spreadsheets, Inventory Control Systems, Microsoft PowerPoint, AutoCAD, Software Systems

High-Road Jobs to Combat Retention and Job Quality Issues

General workforce resources and partners to advance high-road jobs are listed in the Key Findings from Primary Industry Sectors section. Some specific unions that the HRTP could collaborate with include:

- International Brotherhood of Electrical Workers (IBEW) Local 952: represents Electricians, Electrical Apprentices, Communications and Systems Installers, Transportation Systems Journeyman, Construction Wireman and Construction Electricians across manufacturing, construction, and clean technology sectors[189]
- UA Local 484: represents Plumbers, Pipefitters, Steamfitters, Welders, and HVAC-R installers in the MSA[190]
- Sheet Metal Workers Local Union (SMART) No. 104: Serves the MSA with sheet metal workers involved in HVAC, construction, and energy efficiency projects[191]
- Laborer's International Union of North America (LiUNA) Local 585: represents construction workers and employees in environmental fields and offers trainings and apprenticeships[192]

7.5.4   Agriculture, Water, and Environmental Technology

Jobs in the Agriculture, Water, and Environmental Technology sector include a total of 25 occupations, with various sample job titles including Construction Workers, Carpenters, Electricians, Pipe Welders, Building Inspectors, HVAC Installers, and Operators, among others. These occupations are summarized along with industry trends and relevant CCAP Strategies in Table 56. In the MSA, the number of jobs related to Agriculture, Water, and Environmental Technology are expected to remain steady for thirteen of the identified occupations ranging from Pest Control Workers to Hydrologists, and increase for the other eleven occupations. There is one occupation, Hydrologic Technicians, that has insufficient data. Age, race/ethnicity, and gender breakdowns for employees within this sector are highlighted in Figure 15.
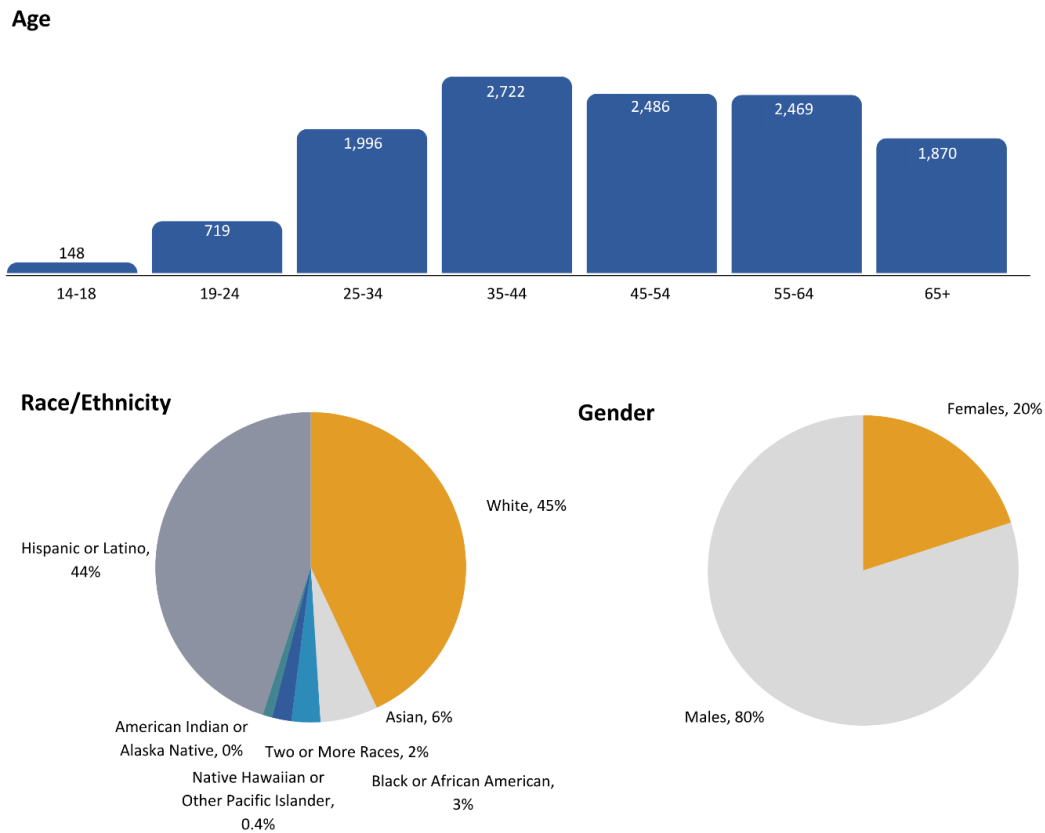
---

[189] IBEW Local 952. 2025. Accessed June 18, 2025, at: https://www.ibewlu952.org/

[190] UA Local 484. 2025. About Us. Accessed June 18, 2025, at: https://www.ualocal484.org/

[191] SMART Local Union No. 104. 2025. Who We Are. Accessed June 18, 2025, at: https://www.smw104.org/

[192] LiUNA Laborers Local 585. 2025. Home. Accessed June 18, 2025, at: https://local585.org/

Figure 15 Oxnard-Thousand Oaks-Ventura MSA Agriculture, Water, and Environmental Technology by Age, Race/ Ethnicity, and Gender

Age

	14-18	19-24	25-34	35-44	45-54	55-64	65+
	148	719	1,996	2,722	2,486	2,469	1,870

Race/Ethnicity

White, 45%
Hispanic or Latino, 44%
Asian, 6%
Black or African American, 3%
Two or More Races, 2%
Native Hawaiian or Other Pacific Islander, 0.4%
American Indian or Alaska Native, 0%

Gender

Females, 20%
Males, 80%

Source: COE. 2024. Clean/Green Jobs Agriculture, Water, and Environmental Technology, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

In 2022, there were 264 regional completions in programs related to the clean/green occupations identified as aligned with Agriculture, Water, and Environmental Technology and 1,520 openings, indicating an undersupply and a supply gap of 1,256 for the clean/green jobs within this sector. The labor shortage, skill gaps, retention and job quality issues are shown in Table 57.

Table 56 Oxnard-Thousand Oaks-Ventura MSA Agriculture, Water, and Environmental Technology Related Occupations and Industry Trends

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Farmers, Ranchers, and Other Agricultural Managers	Plan, direct, or coordinate the management or operation of farms, ranches, greenhouses, aquacultural operations, nurseries, timber tracts, or other agricultural establishments. May hire, train, and supervise farm workers or contract for services to carry out the day-to-day activities of the managed operation. May engage in or supervise planting, cultivating, harvesting, and financial and marketing activities.	N/A	5,122	Anticipated to increase (6%)	Agriculture and NWLs
Environmental Engineers	Research, design, plan, or perform engineering duties in the prevention, control, and remediation of environmental hazards using various engineering disciplines. Work may include waste treatment, site remediation, or pollution control technology.	Air Pollution Control, Engineer, Engineer, Engineering Consultant, Environmental Engineer	113	Anticipated to remain steady (4%)	Waste Management, Water and Wastewater, Agriculture and NWLs
Environmental Engineering Technologists and Technicians	Apply theory and principles of environmental engineering to modify, test, and operate equipment and devices used in the prevention, control, and remediation of environmental problems, including waste treatment and site remediation, under the direction of engineering staff or scientists. May assist in the development of environmental remediation devices.	Air Quality Instrument, Specialist, Engineer, Technician, Environmental, Engineering Assistant, Environmental Engineering, Technician	35	Anticipated to increase (8%)	Waste Management, Water and Wastewater, Agriculture and NWLs
Soil and Plant Scientists	Conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity.	Agronomist, Arboriculture Researcher, Crop Nutrition Scientist, Forage Physiologist, Horticulture Specialist, Plant Physiologist	71	Anticipated to increase (16%)	Agriculture and NWLs
Conservation Scientists	Manage, improve, and protect natural resources to maximize their use without damaging the environment. May conduct soil surveys and develop plans to eliminate soil erosion or to protect rangelands. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour	Conservationist, Environmental Analyst, Environmental Quality Scientist, Erosion Control Specialist, Land Reclamation	43	Anticipated to increase (7%)	Water and Wastewater, Agriculture and NWLs

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
	plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Specialist, Land Resource Specialist			
Hydrologists	Research the distribution, circulation, and physical properties of underground and surface waters; and study the form and intensity of precipitation and its rate of infiltration into the soil, movement through the earth, and return to the ocean and atmosphere.	Groundwater Consultant, Hydrogeologist, Hydrologist, Physical Scientist	11	Anticipated to remain steady (5%)	Water and Wastewater, Agriculture and NWLs
Agricultural Technicians	Work with agricultural scientists in plant, fiber, and animal research, or assist with animal breeding and nutrition. Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments. Conduct tests and experiments to improve yield and quality of crops or to increase the resistance of plants and animals to disease or insects.	Agricultural Research Technician, Agricultural Research Technologist, Agricultural Technician, Seed Analyst	106	Anticipated to increase (8%)	Water and Wastewater, Agriculture and NWLs
Food Science Technicians	Work with food scientists or technologists to perform standardized qualitative and quantitative tests to determine physical or chemical properties of food or beverage products. Includes technicians who assist in research and development of production technology, quality control, packaging, processing, and use of foods.	Central Laboratory Technician (CLT), Food Science Technician (Food Science Tech)	75	Anticipated to increase (11%)	Agriculture and NWLs
Environmental Science and Protection Technicians, Including Health	Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health, under the direction of an environmental scientist, engineer, or other specialist. May collect samples of gases, soil, water, and other materials for testing.	Environmental Health Officer (EHO), Environmental Technician (Environmental Tech), Industrial Pretreatment Program Specialist (IPP Specialist)	102	Anticipated to increase (8%)	Waste Management, Water and Wastewater, Agriculture and NWLs
Hydrologic Technicians	Collect and organize data concerning the distribution and circulation of ground and surface water, and data on its physical, chemical, and biological properties. Measure and report on flow rates and ground water levels, maintain field equipment, collect water samples, install and collect sampling equipment, and process samples for shipment to testing laboratories. May collect data on	N/A	<10	Insufficient data	Water and Wastewater, Agriculture and NWLs

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
	behalf of hydrologists, engineers, developers, government agencies, or agriculture.				
Forest and Conservation Technicians	Provide technical assistance regarding the conservation of soil, water, forests, or related natural resources. May compile data pertaining to size, content, condition, and other characteristics of forest tracts under the direction of foresters, or train and lead forest workers in forest propagation and fire prevention and suppression. May assist conservation scientists in managing, improving, and protecting rangelands and wildlife habitats.	Fire Management Officer, Fire Operations Forester, Fire Prevention Officer, Fire Prevention Technician, Fire Technician, Forest Officer, Wildfire Mitigation Specialist	87	Anticipated to remain steady (4%)	Water and Wastewater, Agriculture and NWLs
Forest Fire Inspectors and Prevention Specialists	Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.	Fire Management Officer, Fire Operations Forester, Fire Prevention Officer, Fire Prevention Technician, Fire Technician, Forest Officer, Wildfire Mitigation Specialist	30	Anticipated to increase (8%)	Agriculture and NWLs
Fish and Game Wardens	Patrol assigned area to prevent fish and game law violations. Investigate reports of damage to crops or property by wildlife. Compile biological data.	Fisheries Enforcement Officer, Game Warden, Natural Resource Officer, State Game Warden, State Wildlife Officer	0	Anticipated to remain steady (0%)	Water and Wastewater, Agriculture and NWLs
First-Line Supervisors of Landscaping, Lawn Service	Directly supervise and coordinate activities of workers engaged in landscaping or groundskeeping activities. Work may involve reviewing contracts to ascertain service, machine, and workforce requirements; answering inquiries from potential customers regarding methods, material, and price ranges; and preparing estimates according to labor, material, and machine costs.	Field Manager, Golf Course Superintendent, Grounds Crew Supervisor, Grounds Foreman, Grounds Maintenance Supervisor	450	Anticipated to remain steady (2%)	Transportation and Mobility, Agriculture and NWLs
Pest Control Workers	Apply or release chemical solutions or toxic gases and set traps to kill or remove pests and vermin that infest buildings and surrounding areas.	Certified Pest Control Technician, Commercial Pest Control Technician, Exterminator, Pest Control Applicator, Pest Control Chemical Technician	364	Anticipated to remain steady (-4%)	Agriculture and NWLs

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Landscaping and Groundskeeping Workers	Landscape or maintain grounds of property using hand or power tools or equipment. Workers typically perform a variety of tasks, which may include any combination of the following: sod laying, mowing, trimming, planting, watering, fertilizing, digging, raking, sprinkler installation, and installation of mortarless segmental concrete masonry wall units.	Gardener, Greenskeeper, Grounds Maintenance Worker, Grounds Person, Grounds Specialist, Grounds Worker, Groundskeeper, Landscape Specialist	4,226	Anticipated to remain steady (2%)	Transportation and Mobility, Agriculture and NWLs
Pesticide Handlers, Sprayers, and Applicators, Vegetation	Mix or apply pesticides, herbicides, fungicides, or insecticides through sprays, dusts, vapors, soil incorporation, or chemical application on trees, shrubs, lawns, or crops. Usually requires specific training and state or federal certification.	Chemical Applicator, Integrated Pest Management Technician (IPM Technician), Lawn Specialist, Lawn Technician	96	Anticipated to remain steady (2%)	Agriculture and NWLs
Tree Trimmers and Pruners	Using sophisticated climbing and rigging techniques, cut away dead or excess branches from trees or shrubs to maintain roads, sidewalks, or utilities, or to improve appearance, health, and value of tree. Prune or treat trees or shrubs using handsaws, hand pruners, clippers, and power pruners. Works off the ground in the tree canopy and may use truck mounted lifts.	Arborist, Climber, Grounds Worker, Groundsman, Laborer, Plant Health Care Technician, Tree Climber, Tree Trimmer, Trimmer	234	Anticipated to remain steady (1%)	Transportation and Mobility, Agriculture and NWLs
Agricultural Inspectors	Inspect agricultural commodities, processing equipment, and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.	Brand Inspector, Consumer Safety Inspector (CSI), Food Inspector, Food Safety and Inspection Service Inspector (FSIS Inspector), Food Sanitarian	60	Anticipated to remain steady (4%)	Agriculture and NWLs
Forest and Conservation Workers	Under supervision, perform manual labor necessary to develop, maintain, or protect areas such as forests, forested areas, woodlands, wetlands, and rangelands through such activities as raising and transporting seedlings; combating insects, pests, and diseases harmful to plant life; and building structures to control water, erosion, and leaching of soil. Includes forester aides, seedling pullers, tree planters, and gatherers of nontimber forestry products such as pine straw.	Christmas Tree Farmer, Conservation Officer, Field Laborer, Forest Ranger, Forest Resource Specialist, Forestry Support Specialist, Park Maintainer	110	Anticipated to remain steady (2%)	Water and Wastewater, Agriculture and NWLs

Occupation	Job Description	Sample Job Titles	# of Jobs in 2022	Projected Job Growth (2022-2027 % Change)	Relevant CCAP Strategies
Hazardous Materials Removal Workers	Identify, remove, pack, transport, or dispose of hazardous materials, including asbestos, lead-based paint, waste oil, fuel, transmission fluid, radioactive materials, or contaminated soil. Specialized training and certification in hazardous materials handling or a confined entry permit are generally required. May operate earthmoving equipment or trucks.	Abatement Worker, Asbestos Abatement Worker, Asbestos Hazard Abatement Worker, Asbestos Remover, Asbestos Worker	144	Anticipated to increase (11%)	Waste Management
Septic Tank Services and Sewer Pipe Cleaners	Clean and repair septic tanks, sewer lines, or drains. May patch walls and partitions of tank, replace damaged drain tile, or repair breaks in underground piping.	Drain Cleaner, Drain Technician, Public Works Technician, Septic Cleaner, Septic Pump Truck Driver, Septic Tank Service Technician	75	Anticipated to increase (14%)	Water and Wastewater
Stationary Engineers and Boiler Operators	Operate or maintain stationary engines, boilers, or other mechanical equipment to provide utilities for buildings or industrial processes. Operate equipment such as steam engines, generators, motors, turbines, and steam boilers.	Auxiliary Operator, Boiler Operator, Boiler Technician (Boiler Tech), Operating Engineer, Operator, Plant Utilities Engineer	114	Anticipated to remain steady (4%)	Waste Management, Water and Wastewater
Water and Wastewater Treatment Plant and System Operators	Operate or control an entire process or system of machines, often through the use of control boards, to transfer or treat water or wastewater.	Plant Operator, Process Operator (Process Op), Relief Operator, Supervisory Control and Data Acquisition Operator (SCADA Operator)	229	Anticipated to remain steady (-2%)	Water and Wastewater
Refuse and Recyclables Materials Collectors	Collect and dump refuse or recyclable materials from containers into truck. May drive truck.	Front Load Trash Truck Driver, Garbage Man, Recycle Driver, Refuse Collector, Roll Off Container Truck Driver	309	Anticipated to increase (8%)	Waste Management

Notes: N/A = not applicable.

Source: COE. 2024. Clean/Green Jobs Agriculture, Water, and Environmental Technology, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Table 57 Oxnard-Thousand Oaks-Ventura MSA Agriculture, Water, and Environmental Technology Potential Workforce Challenges

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Other Challenges	Workforce Challenge Type
Farmers, Ranchers, and Other Agricultural Managers	75	597	Anticipated to increase (6%)	Bachelor's Degree	Moderate: Automated and sensor farm management software	$40.66	Limited career advancement, long hours, physical strain, often non-unionized	
Environmental Engineers	63	8	Anticipated to remain steady (4%)	Associate's Degree	Low	$25.97	Fieldwork in hazardous environments	N/A
Environmental Engineering Technologists and Technicians	6	5	Anticipated to increase (8%)	Associate's Degree	Moderate: operate/ maintain advanced remediation and monitoring equipment	$39.14	Fieldwork in hazardous environments, often limited worker voice	
Soil and Plant Scientists	0	8	Anticipated to increase (16%)	High School Diploma or Equivalent + Additional Training	High: genomics, climate-resilient crop development, soil health	$27.65	Limited worker voice in private roes	
Conservation Scientists	36	4	Anticipated to increase (7%)	No Formal Education Credential	Moderate: GIS, remote sensing	$21.05	Remote and rugged environments, funding instability	
Hydrologists	7	1	Anticipated to remain steady (5%)	High School Diploma or Equivalent + Additional Training	Moderate: modeling software, climate forecasting tools, water reuse systems	$28.89	N/A	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Other Challenges	Workforce Challenge Type
Agricultural Technicians	0	16	Anticipated to increase (8%)	High School Diploma or Equivalent + Additional Training	High: lab automation, data collection tools, biotech applications	$28.56	Limited worker voice	
Food Science Technicians	0	12	Anticipated to increase (11%)	High School Diploma or Equivalent + Additional Training	Moderate: food safety tech	$23.07	N/A	**N/A**
Environmental Science and Protection Technicians, Including Health	6	12	Anticipated to increase (8%)	No Formal Education Credential	Moderate: digital sampling tools, environmental compliance software	$21.46	Low worker voice	
Hydrologic Technicians	5	1	Insufficient data	High School Diploma or Equivalent + Additional Training	Moderate: remote sensing, automated monitoring system	$42.72	Low worker voice	
Forest and Conservation Technicians	0	11	Anticipated to remain steady (4%)	High School Diploma or Equivalent + Additional Training	Moderate: GIS mapping, wildfire modeling, drone-based monitoring	$21.91	Physically demanding, limited career advancement, seasonal work with limited representation	
Forest Fire Inspectors and Prevention Specialists	157	3	Anticipated to increase (8%)	High School Diploma or Equivalent + Additional Training	Moderate: fire modeling software, climate risk assessment tools	N/A	High-risk, emergency roles	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Other Challenges	Workforce Challenge Type
Fish and Game Wardens	0	0	Anticipated to remain steady (0%)	Postsecondary Nondegree Award	Moderate: body cams, GPS tracking, wildlife monitoring tech	$27.89	Limited career advancement, isolated and physical strain	
First-Line Supervisors of Landscaping, Lawn Service	0	48	Anticipated to remain steady (2%)	High School Diploma or Equivalent + Additional Training	Low	$22.91	Limited career advancement, often non-unionized; exposed to weather	
Pest Control Workers	0	46	Anticipated to remain steady (-4%)	Postsecondary Nondegree Award	Moderate: integrated pest management and environmental regulation	$32.53	Exposure to chemicals, limited career advancement, low worker voice	
Landscaping and Groundskeeping Workers	0	566	Anticipated to remain steady (2%)	No Formal Education Credential	Low	$17.41	Limited career advancement, physical strain, often non-unionized; exposed to weather	
Pesticide Handlers, Sprayers, and Applicators, Vegetation	0	13	Anticipated to remain steady (2%)	High School Diploma or Equivalent + Additional Training	Moderate: safe chemical handling, drone spraying systems	Insufficient data	Exposure to chemicals, limited career advancement, low worker voice	
Tree Trimmers and Pruners	0	31	Anticipated to remain steady (1%)	High School Diploma or Equivalent + Additional Training	Low	Insufficient data	High risk, limited career advancement, low worker voice	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Other Challenges	Workforce Challenge Type
Agricultural Inspectors	0	10	Anticipated to remain steady (4%)	Bachelor's Degree	Moderate: digital inspection tools, traceability systems, evolving food safety regulations	$19.46	N/A	
Forest and Conservation Workers	0	20	Anticipated to remain steady (2%)	High School Diploma or Equivalent + Additional Training	Low	$20.95	Seasonal, physically demanding, limited career advancement, low worker voice	
Hazardous Materials Removal Workers	0	19	Anticipated to increase (11%)	High School Diploma or Equivalent + Additional Training	**High**: hazardous waste handling, use of protective equipment, compliance with evolving U.S. EPA regulations.	$23.10	High-risk, exposure to toxic chemicals, limited career advancement; often non-unionized	
Septic Tank Services and Sewer Pipe Cleaners	0	9	Anticipated to increase (14%)	High School Diploma or Equivalent + Additional Training	Low	$21.91	Physical strain, unpleasant environment, limited career advancement and worker voice	
Stationary Engineers and Boiler Operators	6	13	Anticipated to remain steady (4%)	High School Diploma or Equivalent + Additional Training	Moderate: smart building systems, building energy efficiency upgrades	$40.34	N/A	
Water and Wastewater Treatment	31	21	Anticipated to remain steady (-2%)	High School Diploma or Equivalent +	SCADA systems, water reuse technologies,	$37.56	Long hours	

Occupation	Annual Supply of Qualified Candidates	Annual Job Demand	Projected Job Growth (2022-2027 % Change)	Required Education	Upskilling Needs	Hourly Wage	Other Challenges	Workforce Challenge Type
Plant and System Operators				Additional Training	regulatory compliance			
Refuse and Recyclables Materials Collectors	0	44	Anticipated to increase (8%)	No Formal Education Credential	Low	$27.65	Physical strain, exposure to waste minimal advancement, retention issues despite union membership	

Notes: N/A = not applicable. Hourly Wage cells shown in red represent occupations that fall below the local living wage threshold of $22.12/hour for a single adult working full-time.

Source: COE. 2024. Clean/Green Jobs Agriculture, Water, and Environmental Technology, Ventura County. Accessed June 18, 2025. Report can be found in Appendix F Workforce Planning Analysis Reports.

Graduates of community college programs in the MSA that are part of the Agriculture, Water, and Environmental Technology sector, from the 2019-2020 academic year, had a median annual wage upon completion of $26,863. Within the sector, 59 percent of students are employed within a year after completing a program; 53 percent of students were part-time, 6 percent skill builders, 25 percent first-generation, and 62 percent economically disadvantaged. In 2022, the top employers hiring staff for the Agriculture, Water, and Environmental Technology sector were Brightview (44 job postings), Hawx Services (24 job postings), City of Oxnard (17 job postings), State of California (13 job postings), Orkin (12 job postings), Bayer (11 job postings), Aerotek (11 job postings), Actalent (10 job postings), and Oneida Esc. Group (Oesc, 10 job postings).

Of the three workforce challenges, the Agriculture, Water, and Environmental Technology industry experiences labor shortages requiring recruiting initiatives and apprenticeships, skills gaps requiring upskilling and training programs, retention, and job quality issues requiring a transition to high-road jobs.

Recruitment Initiatives to Combat Labor Shortages

There are five institutions including Ventura College, Moorpark College, Oxnard College, California Lutheran University, and California State University - Channel Islands, that currently facilitate programs to train qualified candidates within the Agriculture, Water, and Environmental Technology sector. These programs include:

- Environmental Studies (CIP Code: 3.0103)
- Environmental Science (CIP Code: 3.0104)
- Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician (CIP Code: 15.0501)
- Water Quality and Wastewater Treatment Management and Recycling Technology/Technician (CIP Code: 15.0506)
- Geology/Earth Science, General (CIP Code: 40.0601)
- Fire Prevention and Safety Technology/Technician (CIP Code: 43.0201)
- Fire Science/Fire-fighting (CIP Code: 43.0203)

In considering this combination of clean/green jobs within Agriculture, Water, and Environmental Technology and the supply gap for many of these professions, the following programs were identified to fill the gap if these programs were to open at community colleges and universities across the MSA.

- Agricultural Business and Management, General (CIP Code: 1.0101)
- Agroecology and Sustainable Agriculture (CIP Code: 1.0308)
- Agricultural and Food Products Processing (CIP Code: 1.0401)
- Landscaping and Groundskeeping (CIP Code: 1.0605)
- Plant Nursery Operations and Management (CIP Code: 1.0606)
- Turf and Turfgrass Management (CIP Code: 1.0607)
- Food Science (CIP Code: 1.1001)
- Food Technology and Processing (CIP Code: 1.1002)
- Viticulture and Enology (CIP Code: 1.1004)

- Agricultural/Animal/Plant/Veterinary Science and Related Fields, Other (CIP Code: 1.9999)
- Environmental/Natural Resources Management and Policy, General (CIP Code: 3.0201)
- Natural Resources and Conservation, Other (CIP Code: 3.9999)
- Hazardous Materials Management and Waste Technology/Technician (CIP Code: 15.0508)
- Botany/Plant Biology (CIP Code: 26.0301)
- Sustainability Studies (CIP Code: 30.3301)

The MSA could also partner with Ventura County Resource Conservation District or the California Water Environment Association to try to create apprenticeship opportunities through pursuing AIF to fund apprenticeships.

Upskilling and Training Programs to Combat Skill Gaps

General workforce resources and training programs are listed in the Key Findings from Primary Industry Sectors section. Baseline, specialized, and software skills desired in this sector in 2022 include:

- Baseline skills: Management, Communication, Customer Service, Operations, Good Driving Record, English Language, Lifting Ability, Detail Oriented, Troubleshooting (Problem Solving), Professionalism
- Specialized skills: Landscaping, Irrigation (Landscaping and Agriculture), Pest Control, Groundskeeping, Mowing, Hand Tools, Power Tool Operation, Landscape Maintenance, Soil Science, Weed Control
- Software skills: Microsoft Office, Microsoft Excel, Microsoft Word, Microsoft PowerPoint, Microsoft Outlook, Geographic Information Systems, SAP Applications, Microsoft Project, Spreadsheets, Software Systems

High-Road Jobs to Combat Retention and Job Quality Issues

General workforce resources and partners to advance high-road jobs are listed in the Key Findings from Primary Industry Sectors section. Some specific unions that the HRTP could collaborate with include:

- United Farm Workers (UFW): represents agricultural workers in the MSA, advocating for fair wages, safe working conditions, and workforce development in sustainable agriculture.[193]
- UA Local 484: represents employees of water treatment and wastewater facilities, supporting water infrastructure and environmental technology projects.[194]

---

[193] Untied Farm Workers. 2025. Accessed June 18, 2025, at: https://ufw.org/

[194] UA Local 484. 2025. About Us. Accessed June 18, 2025, at: https://www.ualocal484.org/

8 Community Engagement, Coordination, and Outreach

The CCAP development was informed by robust intergovernmental coordination and outreach. This was facilitated through the CPRG Advisory Group, which included representatives from the local jurisdictions and other interested parties including regional special districts and community-based organizations. A CPRG Subcommittee was also established to collect input from community leaders throughout the region who specialize in the various CCAP sectors and other topics that align with and support the CCAP. Additionally, the community was invited to participate in the planning process through a survey as well as an in-person engagement event, and feedback received was incorporated into the final CCAP.

8.1 Advisory Group and Subcommittee

Feedback from both the Advisory Group and the CPRG Subcommittee is systematically integrated into the CCAP through a structured process. During regular meetings, both groups reviewed and discussed various needs and hurdles related to the CCAP's climate policy and provided insights and suggestions for specific policies based on their unique perspectives and expertise. The following section outlines the roles and responsibilities of each entity, including their purpose, structure, and contributions to the overall project.

8.1.1 Advisory Group

The Advisory Group was essential to the development of the CCAP and consisted of representatives from jurisdictions throughout the MSA as well as representatives from various special districts, the regional transportation planning agency (VCTC), and the local air pollution control district. The role of the Advisory Group was to provide strategic and technical input throughout the planning process as well as insight into community perspectives to support the development of the CCAP and ultimately implementation. With representatives from across the diverse region, members of the group provided valuable insight into unique challenges and potential hurdles that the team was able to discuss and mitigate.

Representatives from the following local government and public agencies' served on the Advisory Group for the development of the CCAP:

- City of Fillmore
- City of Moorpark
- City of Oxnard
- City of Port Hueneme
- City of Santa Paula
- City of Simi Valley
- City of Thousand Oaks
- City of Ventura
- Central Coast Climate Justice Network

- Port of Hueneme
- Ventura County Air Pollution Control District
- Ventura County Transportation Commission
- County of Ventura
- Clean Power Alliance
- Gold Coast Transit District

The Advisory Group convened monthly over the course of a year to develop the CCAP via in-person meetings that were held at various locations throughout the County, ranging from City Halls to the VCTC offices. This approach not only facilitated comprehensive discussions but also confirmed that the perspectives and needs of different communities were effectively integrated into the plan. Figure 16 provides a timeline of the CPRG and Community Advisory Subcommittee (CAS)S meetings.

Figure 16 Timeline of the CPRG and CPRG Subcomittee Meetings

Climate Pollution Reduction Grants Advisory Group (CPRG) Meetings

CPRG Subcommittee Meetings
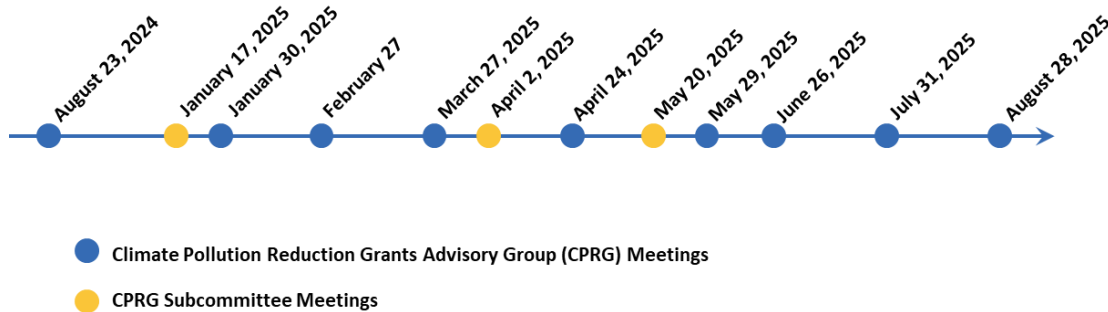
8.1.2   Community Advisory Subcommittee

Complementing the Advisory Group is the CPRG Subcommittee. Meeting quarterly, this subcommittee plays a crucial role in facilitating the reflection of community voices in the plan, particularly those from historically underrepresented groups. By providing a platform for these voices, the subcommittee helped to create a more inclusive and representative plan, confirming the needs and concerns of all community members are addressed. The CAS consisted of representatives from the following organizations:

- Ventura County Community Foundation
- Climate First: Replacing Oil & Gas
- Central Coast Climate Justice Network
- Ventura County Transportation Commission
- Clean Power Alliance
- Saticoy Food Hub
- Friends of Field Workers
- Port of Hueneme
- City of Ventura
- City of Oxnard
- City of Santa Paula

- One Step A La Vez
- California State University, Channel Islands
- Ventura Air Pollution Control District
- MICOP
- Future Leaders Now

8.2   Community Outreach

The final component of this outreach included a virtual workshop hosted by the County of Ventura Sustainability Division Office to provide an opportunity for residents, interested parties, and community organizations to learn about the CCAP, ask questions, and share their perspectives on climate priorities and solutions. The workshop was designed to foster informal, yet informative, dialogue between the public and project team.

9 Review of Authority to Implement

The Ventura County CPRG Advisory Group has worked to ensure that the agencies required to complete the measures and actions have been included in the decision-making and prioritization process and have the authority and clearance to complete and/or adopt these measures and actions. The identification of a lead agency and the obtainment of implementing authority is currently underway by the CPRG Work Group.

10   Intersection With Other Funding Availability

The ability to implement effective climate action hinges not only on planning and policy but also on the availability of financial resources. The wide range of initiatives outlined in this CCAP may require significant investment. Without dedicated funding, jurisdictions may struggle to move beyond planning stages, delaying progress and increasing long-term costs.

Access to funding also enables governments to pursue accessible climate solutions. Many of the communities most vulnerable to climate impacts are also those with the least capacity to adapt. Targeted financial support allows government agencies to prioritize investments in underserved areas, and climate-related funding can serve as a catalyst for economic development. Public investment in green infrastructure and clean technology often attracts private capital, stimulates job creation, and fosters innovation.

Securing funding also enhances a jurisdiction's ability to monitor, evaluate, and adapt its climate strategies over time. As new technologies emerge and climate conditions evolve, flexible funding mechanisms allow for timely updates to programs and policies, ensuring continued alignment with long-term goals.

With these considerations, the CPRG has worked to identify avenues for additional funding of the measures and actions. Currently, the CPRG group is not pursuing any of the identified funding strategies. While individual public agencies within the MSA may be pursuing one or more funding sources, the CPRG group will work to identify existing and new funding opportunities as they begin implementation of the CCAP. Table 58 below highlights and summarizes various grants and resources that can be utilized by jurisdictions across the MSA to fund the reduction measures and actions. These funding opportunities have been called out at the measure level, by Opportunity ID, in the measure summary tables across Section 4.

These opportunities follow from the current grant landscape. As this landscape changes constantly, the CPRG will continue to monitor and apply for additional opportunities as they become available. Individual public agencies within the MSA will also pursue their own opportunities to fund specific actions or measures.

Table 58 Summary of Additional Funding Opportunities

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
Building Energy						
1	Building Initiative for Low-Emissions Development Program (BUILD)	California Energy Commission (CEC)	https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program-build	Up to $2 million in non-incentive program funding (up to $100,000 per applicant) and up to 300 hours of free technical assistance.	The Building Initiative for Low-Emissions Development (BUILD) Program is designed to provide technical assistance and incentives for new all-electric low-income residential buildings that reduce GHG emissions.	No current open applications, however, most recent guidelines were published on March 26, 2025, and grants may be available in the future.
2	Energy Conservation Assistance Act (ECAA)	CEC	https://www.energy.ca.gov/programs-and-topics/programs/energy-conservation-assistance-act/low-interest-loans	1% loans for energy projects up to $3 million per loan.	The ECAA program provides one percent interest loans for eligible energy projects including energy storage systems, and electric vehicle charging infrastructure projects	The ECAA program is currently fully subscribed and new applicants are added to a waiting list. As funds become available, it is anticipated that applications will be accepted on a first-come, first-served basis until all funds are awarded.
3	GoGreen Multifamily Energy Financing	California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA)	https://www.treasurer.ca.gov/caeatfa/cheef/multifamily.asp	Varies depending on project type and company that is providing funding from $5,000 to $5 million.	GoGreen Multifamily Energy Financing program (GoGreen Multifamily) targets affordable and market-rate multi-family properties and features a credit enhancement to help financing entities mitigate risk. Products supported include loans, leases, equipment financing agreements, service agreements and savings-based payment agreements.	Applications are open and considered on a rolling basis.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
4	GoGreen Business Energy Financing	CAEATFA	https://www.treasurer.ca.gov/caeatfa/cheef/sblp/index.asp	Varies depending on project type and company that is providing the funding. Can be up to $5 million.	The GoGreen Business Energy Financing program (GoGreen Business) helps California's small businesses and nonprofits access financing for clean energy generation and storage upgrades, EV charging upgrades, and energy efficiency retrofits through credit enhancement.	Applications are open and considered on a rolling basis.
5	GoGreen Home Energy Financing	CAEATFA	https://www.treasurer.ca.gov/caeatfa/cheef/reel/index.asp	Varies depending on project type and company that is providing the funding. Can be up to $75,000.	GoGreen Home Energy Financing program (GoGreen Home) is designed to help Californians save energy at home by making attractive financing more widely available for home energy improvements. GoGreen Home offers a credit enhancement to mitigate the risk of default, which enables participating lenders to offer lower rates, longer payback terms and higher loan amounts, and to approve a broader base of borrowers for energy upgrade loans.	Applications are open and considered on a rolling basis.
6	Self-Generation Incentive Program (SGIP) / New Home Energy Storage Pilot (NHESP)	California Public Utilities Commission (CPUC) / Southern California Edison (SCE)	https://www.cpuc.ca.gov/sgipinfo/ https://www.sce.com/factsheet/new-home-energy-storage-pilot	Depending on which category a customer is eligible for, they can receive $850 per kWh under the "Equity" Category or $1,000 per kWh under the "Equity Resilience" Category.	Provides rebates for installing distributed energy resources at homes, businesses, and public facilities. Administered by the CPUC, SGIP supports technologies such as battery storage systems, fuel cells, and renewable generation. SCE is introducing clean energy solutions for new construction	The Residential Solar and Storage Equity Incentives are available for reservation beginning June 2, 2025. Available to any low-income residential electric and/or gas customer in California.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
					housing. We are now accepting applications for the New Home Energy Storage Pilot (NHESP).	
7	Electric Program Investment Charge (EPIC) / Advanced Grid Technology Acceleration Projects	CEC	https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program https://www.energy.ca.gov/solicitations/2025-06/gfo-24-312-advanced-grid-technology-acceleration-projects	There is up to $24 million available for grants awarded under this solicitation. The minimum funding amount for each project is $4 million. The maximum funding amount is $12 million.	EPIC invests in innovative technologies like renewable energy, energy storage, and grid modernization and funds programs that support clean energy research, development, and deployment.	Advanced Grid Technology Acceleration Projects due: September 5, 2025, by 11:59 PM.
8	Round 2 Community Energy Reliability and Resilience Investment (CERRI) Program	CEC	https://www.energy.ca.gov/solicitations/2025-05/gfo-23-312r2-round-2-community-energy-reliability-and-resilience-investment	Maximum of $10.4 million for "Small Entities" [sell less than 4,000 GWh] and $20.1 million for "Large Entities" [sell at least to 4,000 GWh].	Designed to provide competitive grant funding for grid-hardening and grid resilience projects that strengthen and modernize California's power grid against wildfires, extreme weather, and other natural disasters.	CERRI Program applications due: August 29, 2025, by 11:49 PM.
Agriculture / Natural and Working Lands						
9	Urban and Community Forestry Grants	CAL FIRE	https://www.fire.ca.gov/what-we-do/grants/urban-and-community-forestry-grants	$150,000 to $1.5 million per project (statewide $30.8 million funded).	Funds community and municipal efforts to plant trees, manage urban forests, and utilize forest waste, focusing on disadvantaged urban areas and enhancing climate resilience.	Not currently accepting applications. Grants awarded yearly. Next round is to be determined.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
10	California Forest Improvement Program (CFIP)	CAL FIRE	https://www.fire.ca.gov/what-we-do/grants/california-forest-improvement	Cost-share assistance is provided to private and public ownerships containing 20 to 5,000 acres of forest land.	The CFIP can provide eligible landowners with technical and financial assistance for planning, reforestation and resource management investments that improve the quality and value of forestland.	Solicitation periods end January 2, April 1, July 1, and October 1 (quarterly).
11	Wildfire Prevention Grants	CAL FIRE	https://www.fire.ca.gov/what-we-do/grants/wildfire-prevention-grants	The recommended funding amount is $3 million or less. Project equipment not to exceed a cumulative total of $750,000. Project supplies (supplies include items under $5,000 per unit cost).	Supports projects that reduce wildfire risk through fuel management, defensible space planning, and education in communities within the wildland-urban interface. Priority given to high fire-risk and disadvantaged communities.	August 6, 2025
12	Rural Energy for America Program (REAP)	Rural Department US Department of Agriculture	https://www.rd.usda.gov/programs-services/energy-programs/rural-energy-america-program-renewable-energy-systems-energy-efficiency-improvement-guaranteed-loans	Renewable: $2,500 to $500,000; Efficiency: $1,500 to $250,000.	Provides grants and guaranteed loans to agricultural producers and rural small businesses to install renewable energy systems or make energy efficiency improvements. Includes bonus funding for projects in disadvantaged communities.	The Agency is not accepting REAP grant applications currently. Guaranteed loan applications may be submitted. Application Windows: The Agency will not be accepting REAP grant or combined grant and guaranteed loan applications between July 1 and Sept 30, 2025.
13	Climate Adaptation and Resiliency Program	California Wildlife Conservation Board	https://wcb.ca.gov/Programs/Climate-Adaptation	Statewide total funding is approximately $2 million per grant; individual awards typically range from $250,000 to $2 million.	Provides grants to public agencies, tribes, nonprofits, and land managers to implement resilience-focused projects on natural and working lands that enhance climate adaptation and carbon sequestration. Projects must align with the California	Last cycle May 6, 2024, at 23:59; currently closed, next round is to be determined.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
					Climate Adaptation Strategy and offer environmental and community co-benefits.	
14	Healthy Soils Program	California Department of Food and Agriculture (CDFA)	https://www.cdfa.ca.gov/oars/healthysoils/	Incentive Grants: up to $100,000 per applicant; Block Grants: $2 million to $5 million per administrator,	Provides funding to farmers, ranchers, and tribes to implement on-farm conservation practices that improve soil health, sequester carbon, and reduce greenhouse gas emissions. Projects may be funded directly through the state or indirectly via regional block grant administrators.	Closed Feb 9, 2024 (Incentives); Block Grant and Demo cycles also closed; next round is to be determined.
15	Forest Health Grants	CAL FIRE	https://www.fire.ca.gov/what-we-do/grants/forest-health	$750,000 to $7 million per project (landscape-scale, 800+ acres).	Provides grants to regionally based partnerships for large-scale forest restoration, including fuels reduction, pest management, prescribed fire, reforestation, and biomass utilization, boosting ecosystem resilience and public safety.	Current solicitation closed January 2025. Next round is to be determined.
16	Environmental Quality Incentives Program (EQIP)	US Department of Agriculture	https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives	Up to $450,000 per contract over program duration; organic initiative cap of $20,000 per year, $80,000 over six years.	Offers financial and technical assistance (cost-share) to agricultural producers and non-industrial forest managers for conservation practices that improve water and air quality, enhance soil health, conserve resources, and mitigate climate risks.	Applications accepted year-round.
Waste Management / Wastewater / Water						
17	Integrated Regional Water Management	California Department of Water	https://water.ca.gov/Work-With-Us/Grants-And-Loans/IRWM-Grant-Programs	Varies by project and region.	Designed to support collaborative, regional water management strategies that enhance water supply	Currently, no open funding opportunities for IRWM grants. However, Prop 4 was approved in Nov 2024, which

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
	(IRWM) Grant Programs	Resources (DWR)			reliability, improve water quality, and address climate resilience. These programs fund a range of projects, including water conservation, stormwater management, groundwater recharge, and ecosystem restoration.	includes additional funds for DWR's Integrated Regional Water Management Program, potentially resulting in future grant funding for various regions.
18	Organics Grant Program	CalRecycle	https://calrecycle.ca.gov/funding/organics/	Up to $13 million per project, with Cycle 7 totaling about $155 million across four project types.	Funds construction, renovation, or expansion of facilities such as digesters, composters, pre-processing units, and in-vessel systems to increase organics diversion, reduce greenhouse gases, and support disadvantaged communities.	Last cycle closed April 2023. Next cycle is to be determined.
Transportation						
19	California Electric Vehicle Infrastructure Project 2.0 (Fast Charge California Project)	CEC	https://calevip.org/fast-charge-california-project	Incentives for eligible equipment may equal up to 100% of the project's total approved costs. $55,000 per charging port for 150 to 274 kW, and $100,000 per charging port for 275+ kW.	Fast Charge California Project provides incentives for purchasing and installing eligible direct current (DC) fast chargers. Total approved costs may include equipment, installation, planning, engineering, etc. Sites must be eligible to the public and applications must have a minimum of 50% combined charging system (CCS) connectors installed.	Application portal opens August 5, 2025. Submission deadline October 29, 2025. Applications considered on a first-come, first-served basis.
20	Energy Infrastructure Incentives for Zero-Emission (EnergIIZE)	Energize Commercial Vehicles	https://acrobat.adobe.com/id/urn:aaid:sc:va6c2:bf1dca2a-d091-4498-8d7e-5210c3df6163?viewer	Up to $5 million total, with a range for set-aside per charger port or hydrogen dispenser (e.g., $31,250 for a less than or	Provides funding for developing charging infrastructure and hydrogen dispensers for medium to heavy duty transit vehicles.	Opened 9 A.M. PT May 6, 2025, to 5 P.M. PT October 2, 2025.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
	Commercial Vehicles Project Transit Set-Aside		%21megaVerb=group-discover	equal to 50 kW EV port and $2.5 million for a hydrogen dispenser).		
21	Sustainable Transportation Planning Grants	CalTrans	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/regional-and-community-planning/sustainable-transportation-planning-grants	Previous grants ranged between $100,000 and $700,000 depending on the grant. Some cost-sharing and investment are needed. Approximately $34.8 million (state and federal funding) awarded annually.	In FY 2024-25, five types of grants were funded: sustainable communities competitive grants, sustainable communities formula grants, climate adaptation planning grants, strategic partnership grants and strategic partnerships – transit grants.	No current open applications, however, previous applications (FY 22-23, FY 23-24, FY 24-25, and FY 25-26) were due in January, so, if available, FY 26-27 will likely have a similar timeline.
22	Depot Charging and Hydrogen Refueling Infrastructure for Zero-Emission Medium and Heavy-Duty on-road, off-road, and specialty vehicles	CEC	https://www.energy.ca.gov/solicitations/2025-03/gfo-24-612-depot-charging-and-hydrogen-refueling-infrastructure-zero-emission	Total allocation is $20 million.	Funding for projects of depot charging and hydrogen refueling infrastructure for zero-emission medium- and heavy-duty (MDHD) on-road, off-road, and specialty vehicles.	The CEC has paused the solicitation and will not accept applications until these updates are complete. Another notification will be sent once the solicitation has re-opened.
23	Active Transportation Program	Caltrans	https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program	$21 million of federal Highway Safety Improvement Program funds or other federal funds; minimum request - $250,000; six application types with varied limits ranging from large projects, with a cost of $10 million or greater for quick-build projects.	Funds projects aimed at increasing walking and biking and enhancing safety and mobility for non-motorized users. ATP consolidates federal and state funds to support infrastructure and non-infrastructure projects, including plans, quick-build projects, and education programs.	New cycle every two years, Cycle 7 application deadline was June 2024, so likely new cycle in 2026.

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
24	Clean Air Fund	Ventura County APCD	https://www.vcapcd.org/clean-air-fund/	Up to $50,000 per project.	Supports local projects that reduce ozone or particulate matter emissions in Ventura County, including public agency, business, or school projects. Past awards have funded EV charging, clean fleets, and outreach.	Application period is open as long as funding is available. Funds are renewed every September.
25	Carl Moyer Memorial Air Quality Standards Attainment Program	CARB / Ventura County Air Pollution Control District (APCD)	https://www.vcapcd.org/carl-moyer-ab-617-cap-farmer/ https://ww2.arb.ca.gov/our-work/programs/carl-moyer-memorial-air-quality-standards-attainment-program https://ww2.arb.ca.gov/our-work/programs/farmer-program	70% for off-road mobile equipment replacement (80% for first-time grantees). 70% for agricultural pump repowers with diesel engines. 85% for agricultural pump repowers with electric motors. 85% for marine vessel repowers. 85% for locomotive repowers. 80% for emergency vehicle replacements or repowers. 50% to 80% for replacement of heavy-duty diesel truck with a zero-emissions truck. Up to 100% for replacement of diesel public school bus with a zero-emission bus. 50% to 100% for infrastructure equipment and installation.	Provides competitive grants for cleaner-than-required engines and equipment in heavy-duty, off-road, marine, and agricultural sectors to reduce air pollution.	Application period opens every year, typically from March to June.
26	FARMER				Supports replacement of high-emitting agricultural trucks, tractors, and pumps with cleaner equipment, targeting rural and agricultural air quality improvements.	

Opportunity ID	Opportunity Title	Organization	Link	Amount ($)	Description	Application Deadline
27	126 Corridor EV Chargers	Ventura County APCD	https://www.vcapcd.org/126-corridor-ev-chargers/	$1.5 million in total.	Provides funding for EV charger infrastructure along the CA-126 corridor to support clean transportation and reduce corridor-specific emissions. Eligible projects may include public or fleet chargers.	Application period is open as long as funding is available. At this time, no definite plans to renew funds once they run out.
28	Old Car Buyback	Ventura County APCD	https://www.vcapcd.org/old-car-buyback/	$1,000 for 1997 or older operable cars, light-duty pickup trucks, SUVs and vans.	Offers cash incentives to retire older, high-polluting vehicles to reduce smog-forming and toxic emissions in Ventura County. Available to residents meeting vehicle eligibility requirements.	Open year-round until funds run out. Funds are renewed every couple of years.
29	Surface Transportation Block Grant	Southern California Association of Governments (SCAG)	https://scag.ca.gov/stbg-cmaq-program	Approximately $619 million total ($306 million for FY 2026-2027 and $313 million for FY 2027-2028)	Flexible federal-aid program for infrastructure and mobility enhancements across SCAG region.	The call for project nominations for SCAG's Federal Fiscal Year 2026-2027 and 2027-2028 STBG/CMAQ funding cycle is now closed (open March 31 through May 15, 2025). Future funding cycle application windows are currently unknown but are likely to follow similar timeline.
30	Congestion Mitigation and Air Quality Improvement Program	SCAG	https://scag.ca.gov/stbg-cmaq-program	Approximately $615.9 million total ($304.9 million for FY 2026-2027 and $311 million for FY 2027-2028)	Targets air quality improvement and congestion mitigation in nonattainment areas.	

11   Next Steps

This CCAP was developed with the input of public and private agencies, representatives, and community members across the MSA. Successfully meeting the goals described in this document depends first and foremost on the continued coordination and strong leadership from those positioned to implement the measures and actions outlined within the time frames required.

Expanding the Ventura County Regional Energy Alliance (VCREA) into a full-scale Regional Climate Coalition (i.e., Measure C-1 in Section 4) is a critical next step in advancing the CCAP's implementation across the MSA. VCREA provides a strong foundation for regional energy collaboration. Strengthening and broadening VCREA's role in climate policy implementation will enable coordinated action across jurisdictions and sectors such as transportation, land use, waste, and wildfire resilience. The Coalition will foster regional alignment, shared accountability, and fair implementation by expanding the governing board to include a diverse set of interested parties, including local jurisdictions and representatives from priority communities. Sector-specific working groups will support strategy development and funding pursuits, while partnerships with focused organizations will enhance capacity-building. Transparency and collaboration will be supported through regular meetings, annual recognition events, and a centralized knowledge-sharing platform. This expanded framework will position VCREA as a regional hub for climate action, enabling more effective and inclusive implementation of CCAP measures.

Because many of the policies and programs outlined in the CCAP require formal adoption and action by local jurisdictions, the Coalition will serve a critical role in enabling local implementation. It will provide cities with information, tools, model policies, and technical resources to support adoption and tailoring of regional strategies. Additionally, the Coalition will act as a regional grant facilitator—identifying funding opportunities, writing competitive applications, and administering multi-jurisdictional or pass-through grant programs. This structure will help overcome resource and capacity gaps that can slow local progress, especially in smaller or under-resourced communities.

Most of the measures and actions described include the establishment of a working group, lead agencies, and progress tracking metrics. These actions are essential for effective and accountable implementation. Working groups bring together subject matter experts and interested parties to focus on specific areas, fostering collaboration, innovation, and tailored solutions. Designating lead agencies provides clear ownership and responsibility, helping to streamline decision-making and maintain momentum. Progress tracking metrics are vital for measuring outcomes, identifying challenges early, and making data-informed adjustments. Together, these elements create a structured, transparent, and results-driven approach that enhances the likelihood of achieving regional climate goals.

To help the region meet its climate goals, additional steps should be considered. These include developing a robust data and monitoring framework to track greenhouse gas emissions and climate resilience metrics across jurisdictions and over time. Ongoing and increased community engagement and education will also be critical for building public support and incorporating local perspectives into implementation efforts. The MSA will also explore financing mechanisms, such as green bonds or climate resilience funds, to support long-term investments. Finally, integrating climate considerations into all regional planning processes, from housing and transportation to economic development, will help embed sustainability into the region's growth trajectory. These

actions will then strengthen the foundation laid by VCREA and accelerate progress with climate action in the MSA.

12   Appendices

Appendix A Greenhouse Gas Inventory Analysis Report

Appendix B Greenhouse Gas Emissions Forecast and
Targets Report

Appendix C Measure Quantification Analysis Report

Appendix D Natural Working Lands Report

Appendix E Priority Communities Analysis Report

Appendix F Workforce Planning Analysis Reports

This page left intentionally blank.