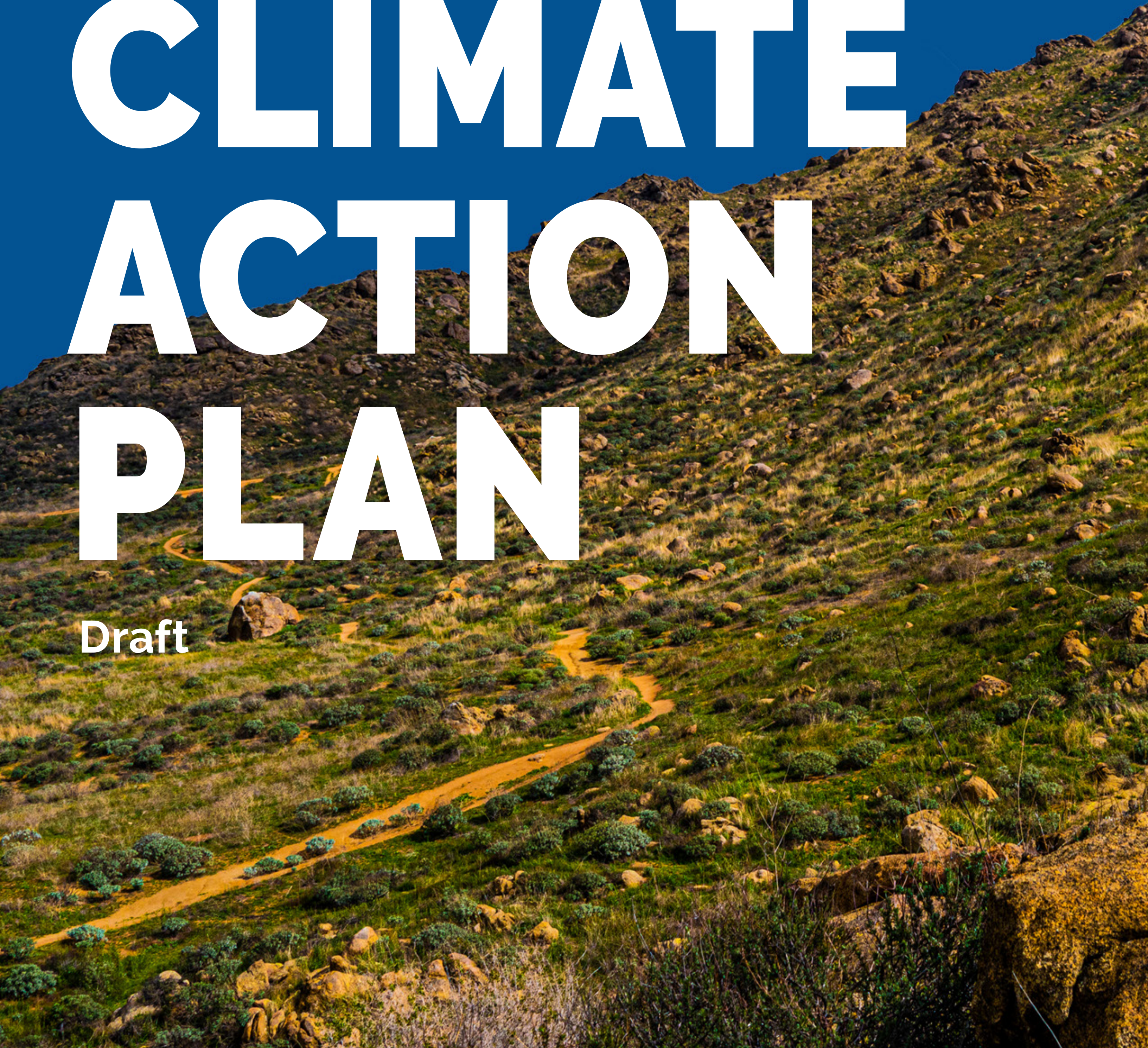
City of Moreno Valley

MORENO VALLEY
WHERE DREAMS SOAR

CLIMATE ACTION PLAN

Draft



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Glossary of Terms and Acronyms

A

Active Transportation – Any form of human-powered transportation, such as walking or bicycling that promotes physical activity and reduces reliance on motor vehicles.

Affordable Housing and Sustainable Communities Program (AHSC) – A program that funds projects that implement land-use, housing, transportation, and agricultural land preservation practices that reduce greenhouse gas (GHG) emissions. Funding is provided by the Greenhouse Gas Reduction Fund, an account established to receive Cap-and-Trade auction proceeds.

Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) – A public-private partnership in California dedicated to advancing the production, distribution, and use of clean hydrogen as a key strategy for reducing GHG emissions and promoting energy resilience.

Assembly Bill (AB) – Legislation introduced in the California State Assembly. Each bill is assigned an "AB" number (e.g., AB 32), indicating it originated from the Assembly. The year in parenthesis following each bill represents the year it was enacted.

Average Vehicle Ridership (AVR) – A measure of how many people, on average, commute in a single vehicle. It is used to gauge the effectiveness of programs aimed at reducing solo driving.

B

Bicycle Network Analysis (BNA) – Method used to evaluate how well a city's or region's bike infrastructure connects people to key destinations, such as schools, jobs, and parks. It assesses the safety, accessibility, and connectivity of bike routes to identify gaps and prioritize improvements.

Business-as-Usual (BAU) – A scenario in which no additional efforts or policies are implemented beyond what is already in place, providing a baseline for measuring future climate or emissions reductions strategies.

Box Springs Mutual Water Company (BSMWC) – A locally managed water service provider that supplies potable water to residential and commercial customers in portions of Moreno Valley and the surrounding region.

Building Initiative for Low-Emissions Development (BUILD) – A California State program that provides financial incentives for all-electric, low-emissions building projects, with a focus on reducing GHG emissions from new construction and existing buildings.

C

California Environmental Quality Act (CEQA) – A California law requiring public agencies to evaluate and disclose the environmental impacts of proposed projects and to minimize or mitigate those impacts when feasible.

California Air Resources Board (CARB) – The State agency responsible for protecting public health from the effects of air pollution and for regulating sources of GHG and other air pollutants in California.

California's Department of Resources Recycling and Recovery (CalRecycle) – The State agency responsible for protecting public health from the effects of air pollution and for regulating sources of GHGs and other air pollutants in California.

California Electric Homes Program (CalEHP) – The State agency responsible for overseeing California's waste management and recycling efforts, including programs aimed at reducing landfill waste, increasing composting, and promoting a circular economy.

California Energy Commission (CEC) – California's primary energy policy and planning agency responsible for promoting energy efficiency, advancing renewable energy development, supporting innovation in clean energy technologies, and ensuring a safe, resilient, and reliable energy system. The CEC also advises the Governor and Legislature on energy policy and plays a key role in implementing the State's climate and energy goals.

California Green Building Standards Code (CALGreen) – The first Statewide green building code in the nation, mandating specific sustainable construction standards for residential and nonresidential buildings in California.

California Transportation Commission (CTC) – A 13-member commission responsible for programming and allocating funds for the construction of highway, passenger rail, transit and active transportation improvements throughout California. The Commission also advises and assists the Secretary of the California State Transportation Agency and the Legislature in formulating and evaluating State policies and plans for California's transportation programs.

Carbon Dioxide (CO_2) – A naturally occurring gas is also produced by human activities such as the combustion of fossil fuels. It is the primary GHG contributing to climate change.

Carbon Dioxide Equivalent (CO_2e) – A standard unit of measure for describing the global warming potential of different GHGs in terms of the amount of CO_2 that would have the same impact.

Carbon Neutral/Neutrality – The state or goal of achieving net-zero carbon emissions by balancing the amount of carbon released with an equivalent amount of carbon removal or offset. It involves reducing emissions wherever possible and compensating for any remaining emissions through activities such as reforestation, renewable energy projects, or carbon capture.

Carbon Sequestration – The process of capturing and storing atmospheric carbon dioxide in natural or engineered systems. It helps mitigate climate change by preventing or slowing the release of CO_2 into the atmosphere through methods such as reforestation, soil management, and carbon capture technologies.

Climate Action Plan (CAP) – A strategic document outlining specific policies, programs, and actions to reduce GHG emissions and enhance resilience to climate change at a local or regional level.

Community-based Organization (CBO) – A public or private nonprofit organization that is representative of the community or specific segments of a community and provides educational or outreach services to the community.

Cost Savings – The net reduction in expenses realized when the incremental costs associated with these new technologies are partially or fully offset by incentives, rebates, or other financial supports.

Clean Freight Corridor Efficiency Assessment – An assessment required by SB 671 and performed by the CTC to identify freight corridors, or segments of corridors, and the infrastructure needed to support the deployment of zero-emission medium- and heavy-duty vehicles.

Clean Off-Road Equipment Voucher Incentive Program (CORE) – A multi-million-dollar incentive project intended to encourage California off-road equipment users to purchase or lease currently commercialized zero-emission off-road equipment.

D

Decarbonize/ Decarbonization – The process of reducing or eliminating carbon dioxide (and other GHGs) from energy sources, industries, and operations, typically by transitioning to low- or zero-carbon technologies.

Density Bonus Program – A California law that grants developers the ability to build additional housing units beyond local zoning limits in exchange for including affordable and senior housing.

Department of Energy (DOE) – A federal agency tasked with shaping national energy policy, conducting research on advanced energy technologies, and promoting energy efficiency, renewable energy, and climate resilience initiatives.

Development Impact Fee (DIF) – A fee imposed by local governments on new development projects to help fund public infrastructure and services, such as roads, schools, parks, and public safety, that are needed due to population growth.

E

Eastern Municipal Water District (EMWD) – A regional water and wastewater utility serving portions of western Riverside County, including Moreno Valley, providing drinking water, wastewater treatment, and recycled water services.

Electric Program Investment Charge (EPIC) – A California Public Utilities Commission program that funds research, development, and deployment of innovative clean energy technologies to benefit ratepayers and support the State's climate goals.

Electric Vehicle (EV) – A vehicle powered by one or more electric motors, typically drawing electricity from batteries that can be recharged from the power grid or other energy sources.

Energy Conservation Assistance Act (ECAA) Program – A California financing program that provides low-interest loans and technical assistance to public agencies for energy efficiency and renewable energy projects aimed at reducing energy costs and emissions.

Environmental Impact Assessment (EIA) – A process required under environmental laws to evaluate and disclose the potential environmental effects of a proposed project before approval, ensuring that significant impacts are minimized or mitigated.

Environmental Impact Report (EIR) – A detailed analysis required by CEQA that evaluates the potential environmental effects of a proposed project, proposing ways to reduce or mitigate those impacts.

F

Family Electric Rate Assistance (FERA) – A California utility discount program for households of three or more people who meet certain income guidelines, offering a reduced electricity rate.

Fourth Assessment Report (AR4) – A major climate change assessment published by the Intergovernmental Panel on Climate Change (IPCC) in 2007, which informed global policy discussions on climate action.

Fuel Cell Electric Vehicles (FCEV) – Zero-emission vehicles powered by hydrogen fuel cells that generate electricity to drive an electric motor, offering long driving ranges and fast refueling times compared to battery electric vehicles.

G

General Plan Update (GPU) – A comprehensive revision of a city's or county's General Plan to reflect changing community needs, state laws, and long-term planning goals. It ensures that policies guiding land use, housing, transportation, and environmental sustainability remain relevant and effective for future development.

Moreno Valley is currently undertaking the 2024 General Plan Update (GPU) to guide thoughtful growth and development through the year 2040, ensuring the community's needs are met while promoting sustainability, equity, and economic vitality.

Global Warming Potential (GWP) – A measure of how much heat a GHG traps in the atmosphere over a specific time period, compared to the same amount of carbon dioxide.

Greenhouse Gas (GHG) – Any gas that traps heat in the atmosphere, contributing to the greenhouse effect. Common GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases.

H

Heating, Ventilation, and Air Conditioning (HVAC) – A system used in residential, commercial, and industrial buildings to control indoor air quality, temperature, and humidity, improving occupant comfort and energy efficiency.

Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) – A California incentive program that provides discounts to fleet operators for purchasing clean, hybrid, and zero-emission trucks and buses to reduce air pollution and GHG emissions.

I

International Council for Local Environmental Initiatives (ICLEI) – A global network of more than 1,750 local and regional governments committed to sustainable urban development – emissions estimates were calculated using ICLEI's best available methodologies.

Integrated Resource Plan (IRP) – Long-term planning document used by electric utilities to evaluate and select a mix of energy resources—such as renewables, fossil fuels, and energy efficiency—to reliably and cost-effectively meet future electricity demand while considering environmental, regulatory, and policy goals.

Intergovernmental Panel on Climate Change (IPCC) – A United Nations body that evaluates science related to climate change, providing policymakers with regular scientific assessments and guidance.

Incremental Costs – Incremental (or marginal costs) refer to the difference between the total upfront expense of a conventional system and that of the higher-efficiency or zero-emission system.

J

K

Keep MoVal Beautiful – A community-driven program in Moreno Valley that focuses on beautification efforts, litter reduction, and environmental stewardship to enhance public spaces and promote sustainable practices.

L

Long-Duration Energy Storage (LDES) – Energy storage systems capable of storing and discharging electricity over extended periods (several hours to days), helping to improve grid stability and integrate more renewable energy sources.

Low Carbon Transit Operations Program (LCTOP) – A California funding program that supports transit projects aimed at reducing GHG emissions, expanding public transit services, and improving mobility for low-income and disadvantaged communities.

M

Medium and Heavy Duty (MDHD) – A classification of vehicles that are designed to carry heavier loads and perform more demanding tasks.

Methane (CH_4) – A potent GHG emitted by natural sources (e.g., wetlands) and human activities such as livestock farming, landfills, and fossil fuel production.

Metric Tons (MT) – A unit of weight in the metric system and is equal to 1,000 kilograms or approximately 2,204.62 pounds. It provides a standardized unit for measuring large quantities of GHG emissions.

Micro-transit – A flexible form of shared transportation, often using smaller vehicles and app-based scheduling, operating on-demand or along dynamic routes within a defined service area.

Moreno Valley Unified School District (MVUSD) – The public school district serving Moreno Valley, providing education to students from kindergarten through 12th grade across multiple campuses and programs.

Moreno Valley Electric Utility (MVU) – The public electric service that serves Moreno Valley.

N

Nitrous Oxide (N_2O) – A powerful GHG released through agricultural and industrial activities, as well as combustion of fossil fuels and solid waste.

O

Offroad Equipment – Any non-stationary device powered by an internal combustion engine or electric motor used primarily off roadways such as agricultural, landscaping or construction equipment.

Office of Land Use and Climate Innovation (LCI) - The State agency responsible for land use planning, climate change mitigation and adaptation, and housing initiatives. Previously named the Office of Planning and Research.

P

Panel Upgrade – The process of replacing or increasing the capacity of an electrical panel to accommodate higher electrical loads, often necessary when installing electric vehicle chargers, heat pumps, or solar panels.

Photovoltaic (PV) – A technology that converts sunlight directly into electricity using semiconductor materials, commonly used in solar panels to generate clean, renewable energy for homes, businesses, and the power grid.

Power Purchase Agreement (PPA) – A financial contract in which a third-party developer installs, owns, and maintains a renewable energy system, and a customer agrees to purchase the electricity generated at a fixed rate, reducing upfront costs.

Property Assessed Clean Energy (PACE) – A financing mechanism that enables property owners to fund energy efficiency, renewable energy, and water conservation improvements through an assessment on their property tax bill.

Q

R

Reach Code – A local or regional building code that goes beyond minimum Statewide or national energy efficiency requirements. Reach codes set higher standards to drive increased energy efficiency, reduce carbon emissions, and promote sustainable building practices.

Renewable Energy Credit (REC) – Represents the environmental attributes of electricity generated from renewable sources like wind or solar. One REC is issued for every megawatt-hour of renewable electricity added to the grid, and they can be purchased to claim the use of renewable energy without directly consuming it.

Renewables Portfolio Standard (RPS) – A regulatory policy that requires electricity providers to supply a certain percentage of their power from renewable energy sources, often with targets increasing over time to foster clean energy development.

Renewable Natural Gas (RNG) – A low-carbon alternative to conventional natural gas, produced from organic waste sources such as landfills, wastewater treatment plants, and agricultural operations, used for transportation and energy generation.

Riverside County Transportation Analysis Model (RIVCOM) – Sophisticated transportation modeling system developed by the Western Riverside Council of Governments. It analyzes road networks, socio-economic data, driver behavior, and goods movement to forecast traffic patterns, with a primary focus on Riverside County.

Riverside County Transportation Commission (RCTC) – The regional agency responsible for planning, funding, and implementing transportation infrastructure and public transit projects in Riverside County.

Riverside Transit Agency (RTA) – The public transportation provider in Riverside County, offering fixed-route and dial-a-ride bus services to improve mobility and reduce vehicle emissions.

S

Senate Bill (SB) – Legislation introduced in the California State Senate. Each bill receives an "SB" number (e.g., SB 1000), indicating it originated in the Senate. The year in parenthesis following each bill represents the year it was enacted.

Single Margin Source Energy Score Ordinance – A local amendment to the building code that establishes a single metric to evaluate a building's energy efficiency or GHG emissions. The single metric is established for buildings of all energy types to set a consistent standard for new construction.

Self-Generation Incentive Program (SGIP) – A California Public Utilities Commission program providing financial incentives for the installation of on-site energy storage and other self-generation technologies.

Solar on Multifamily Affordable Housing (SOMAH) – A California State program that provides financial incentives for installing solar photovoltaic systems on affordable multifamily housing, benefiting low-income residents by reducing energy costs.

South Coast Air Quality Management District (South Coast AQMD) – The regulatory agency responsible for monitoring and improving air quality in Southern California through emissions controls, permitting, and pollution reduction programs.

Southern California Association of Governments (SCAG) – The regional planning organization responsible for developing long-term transportation, housing, and climate policies for six counties in Southern California, including Riverside County.

Southern California Edison (SCE) – One of California's largest electric utilities, delivering electricity to millions of customers in Southern California, including Moreno Valley.

Southern California Gas Company (SoCalGas) – The primary natural gas provider for Southern California, supplying energy to residential, commercial, and industrial customers.

Small Off-Road Engine (SORE) – A category of fossil fuel-powered engines under 25 horsepower, commonly found in lawn and garden equipment such as leaf blowers, lawnmowers, and generators.

Smart Panel – An advanced electrical panel that monitors and controls a home's electricity. They can be used to help lower electricity bills and optimize energy usage by prioritizing certain loads, monitoring electricity usage in real-time with alerts, and connecting to solar panels and battery storage.

Sustainable Transportation Equity Project (STEP) – A California program that provides funding for transportation projects that improve clean mobility options in low-income and disadvantaged communities.

T

Title 24, California Code of Regulations (2022) – The California Building Standards Code, which governs the design and construction of buildings to ensure safety, energy efficiency, and environmental responsibility. It includes requirements for structural integrity, energy use, green building practices, and accessibility for all new and renovated buildings in the State.

Transportation Demand Management (TDM) – Strategies and policies designed to reduce traffic congestion and single-occupancy vehicle use by promoting alternative transportation modes such as public transit, biking, and carpooling.

U

United States Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Community Protocol) – National standard developed by ICLEI – Local Governments for Sustainability USA that provides guidance for local governments to estimate and report GHG emissions from community-wide activities.

Upfront Costs – The costs associated with purchasing and installing an item, including any City staff time spent on related activities like procurement, planning, or ordinance development.

Urban Water Management Plan (UWMP) – A long-term water resource planning document required for urban water suppliers in California to ensure the reliability and sustainability of water supplies over a 20-year period.

V

Vehicle Miles Traveled (VMT) – A metric used in transportation planning to measure the total miles traveled by all vehicles within a specific area, often used to assess traffic impacts and GHG emissions.

W

Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program – A regulatory program by the South Coast Air Quality Management District that requires warehouse operators to reduce emissions through mitigation fees, clean energy investments, or operational changes.

Western Riverside Council of Governments (WRCOG) – A regional agency that supports planning, economic development, and sustainability efforts for cities and counties in western Riverside County.

Y

Z

Zero-Emission Vehicles (ZEV) – Vehicles that produce no direct (tailpipe) emissions of pollutants or GHGs, such as battery electric cars or hydrogen fuel cell vehicles.

PURPOSE

The Moreno Valley Climate Action Plan serves as an evolving document to help the community build upon existing climate efforts to establish measures and actions to reduce communitywide greenhouse gas emissions in line with California's climate goals, provide California Environmental Quality Act GHG emissions analysis streamlining, and guide the community towards sustainable economic development.

1.

INTRODUCTION

Goal of the Climate Action Plan

The Moreno Valley Climate Action Plan (CAP) acknowledges Moreno Valley's opportunity to reduce the community's fair share of greenhouse gas (GHG) emissions and help mitigate the impacts of climate change. This document acts as an evolving guide to help Moreno Valley build upon existing efforts to reduce GHG emissions in accordance with the community's and State of California's (the State) aligned climate goals. This CAP establishes measures and actions specifically designed to reduce Moreno Valley's communitywide GHG emissions in line with the State's goal of reducing GHG emission levels by 40 percent below 1990 levels by 2030 pursuant to Senate Bill (SB) 32 (2016). These measures and actions also guide Moreno Valley in making substantial progress with reducing community-wide GHG emissions to net zero by 2045, consistent with the State's goal of achieving carbon neutrality by 2045 pursuant to Assembly Bill (AB) 1279 (2022). The measures and actions emphasize practical, measurable, and time-bound strategies, providing a framework that can be implemented, monitored and adjusted to best serve the community. Context on the foundational climate-related State regulations and the history of climate efforts in Moreno Valley from which the CAP was built can be found in Appendix A.

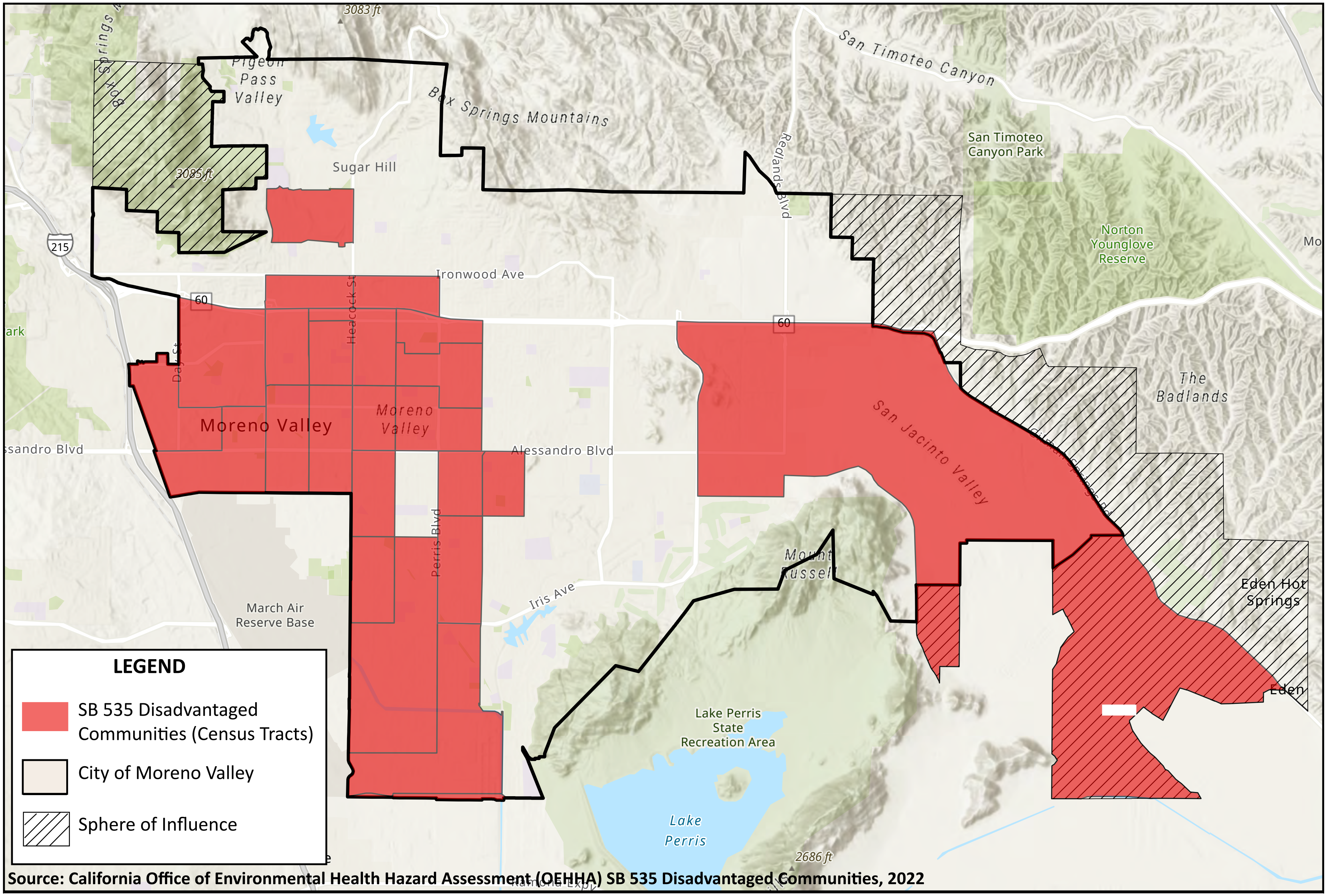
By aligning with the State's GHG emissions reduction goals and meeting the requirements of California Environmental Quality Act (CEQA) Guidelines Section 15183, the CAP intends to analyze and mitigate the GHG emissions at a programmatic level and provide CEQA GHG emissions analysis streamlining. This CAP is also intended to help guide the community towards proactive, long-term investments that will result in sustainable economic development and carbon neutrality in Moreno Valley.

Climate Action Plan Vision

With a diverse community and a robust workforce, Moreno Valley envisions a healthy community and a growing business hub for sustainable economic development. This vision includes creating vibrant public spaces and appealing residential neighborhoods that provide the community with clean air, affordable mobility options, and meaningful green spaces. This vision hinges on Moreno Valley's economic success defined by the community's ability to attract, support, and retain a diverse array of businesses that can sustain the local economy amidst changing market conditions. Climate action provides a unique opportunity to improve our public spaces and residential neighborhoods while catalyzing local economic development. Working towards a healthy community will require investments in renewable energy, transportation infrastructure, building renovation, urban greening, and so much more. Moreno Valley envisions aligning these investments with a growing business hub to leverage new businesses, jobs, and technologies. Such alignment will provide local businesses with sustainable industry segments that align with California's climate goals and the local workforce with meaningful employment.

At the heart of this vision is a commitment to equity and collaboration. This CAP aims to identify and overcome obstacles to equitable climate action, providing all community members—especially those living on low incomes and those in disadvantaged communities—with the benefits from modern technologies, a healthier environment, and more resilient economy. As illustrated in Figure 1-1 below, about half of the census tracts in Moreno Valley are designated as Disadvantaged Communities under SB 535 (2012). This designation highlights the importance of equity in the community. Additionally, this CAP emphasizes building strong partnerships with community-based organizations, regional agencies, and utilities to create a supportive network working together towards the vision of a healthier community and sustainable economic development.

Figure 1-1. Disadvantaged Communities Census Tracts Map



Planning and Development Process

This section provides a summary of how the CAP was developed, including relevant community engagement and participation from City staff and decision-makers.

Community Engagement and Outreach

As part of the development of Moreno Valley's 2021 General Plan Update (GPU) and CAP,[1] the City made a diligent and concerted effort to reach out to residents, property owners, business owners, housing advocates, development community, and other stakeholders to solicit input on the future of Moreno Valley. The City hosted multiple forms of public outreach and engagement activities to maximize informed public participation and input. Activities included public workshops, facilitated discussions, stakeholder interviews, community pop-up events, public surveys, the formation of an Advisory Committee, and environmental justice listening sessions which focused on input from disadvantaged communities. Outreach to solicit participation at these activities included distribution of flyers in English and Spanish to libraries, five coffee houses, ten grocery stores/small markets, the Chambers of Commerce, and numerous churches. Community priorities and concerns heard during these outreach and engagement activities guided the development of this CAP.

City Staff and Decision-Makers

Throughout the development of the CAP, the City also engaged City staff across seven departments, including Community Development, Economic Development, City Manager, City Attorney, Public Works, Moreno Valley Electric Utility (MVU), and Financial & Management Services. The input from City staff resulted in a refined list of measures and actions, along with an implementation plan that aligns with both community and departmental priorities and is realistic and implementable. Additionally, information will be presented to City decision-makers, including the Planning Commission and the City Council, throughout the CAP adoption process to answer questions, address concerns in real-time, and revise the CAP's measures and actions as necessary.

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1. *Moreno Valley performed community engagement during the development of the 2021 GPU and CAP in 2020. While these plans were put aside, the community engagement that occurred still provided valuable guidance for the 2024 GPU and CAP.*

Climate Change Overview

The CAP is centered around reducing GHG emissions due to the global impact of GHG emissions on climate change and the local impact of climate change in Moreno Valley. The following subsections describe the scientific context of GHG emissions and the impacts of climate change.

The Greenhouse Gas Effect and Climate Change

The primary driver of Earth's climate is energy from the sun. When solar radiation enters Earth's atmosphere, some of it is reflected into space, while the rest is absorbed by the planet's surface. This absorbed energy warms the surface, which then emits heat back toward the atmosphere.[2] While some of this heat escapes into space, a portion is trapped by atmospheric gases known as GHGs.[3] This natural process, called the greenhouse effect, is crucial for maintaining temperatures that support life on Earth. However, as illustrated in Figure 1-2 below, the addition of excess GHGs to the atmosphere traps more heat near the Earth's surface, raising global average temperatures and leading to climate change.[4]

Human-induced climate change is well understood and widely accepted by the scientific community, with over 97 percent of climate scientists agreeing that the planet is warming and human activities are the primary cause.[5] Scientists can access records of the historical atmosphere by extracting ice cores, sometimes reaching depths over a mile.[6] The layers of ice contain particles-such as dust, ash, pollen, trace elements, and sea salts—that were present in the atmosphere at different points in history.[7] As ice compresses over time, tiny bubbles of the atmosphere, including GHGs like carbon dioxide and methane, become trapped in it.[8] These air pocket fossils provide samples of what the atmosphere was like when that layer of ice formed.[9] Scientists can directly measure the amount of GHGs present in the atmosphere at that time by analyzing these bubbles.[10] By collecting cores from various locations around the world, researchers can study regional climate variations and distinguish these patterns from global climate trends.[11]

According to the Intergovernmental Panel on Climate Change (IPCC), GHG levels are now higher than they have been in the past 400,000 years. This dramatic increase is attributed to activities such as burning fossil fuels, deforestation, and industrial processes.[12] Global surface temperature has increased faster since 1970 than in any other 50-year period over at least the last 2000 years.[13]

The rise in global average temperatures produced by the GHG Effect, as illustrated in Figure

2. *The National Aeronautics and Space Administration (NASA). The Causes of Climate Change, Climate Change: Vital Signs of the Planet.* ***https://climate.nasa.gov/causes***..
3. *UCAR. The Greenhouse Effect | Center for Science Education.* ***https://scied.ucar.edu/learning-zone/how-climate-works/greenhouse-effect***.
4. *IPCC. Summary for Policymakers — Global Warming of 1.5 oC.* ***https://www.ipcc.ch/sr15/chapter/spm/***.
5. *NASA. Scientific Consensus: Earth's Climate Is Warming. Climate Change: Vital Signs of the Planet.* ***https://climate.nasa.gov/scientific-consensus***.
6. *The National Aeronautics and Space Administration (NASA). 2017. Core questions: An introduction to ice cores.* ***https://science.nasa.gov/science-research/earth-science/climate-science/core-questions-an-introduction-to-ice-cores/****. Accessed January 2025.*
7. *Ibid.*
8. *Ibid.*
9. *Ibid.*
10. *Ibid.*
11. *Ibid.*
12. *The National Aeronautics and Space Administration (NASA). 2022. The Effects of Climate Change.* ***https://climate.nasa.gov/effects/***.
13. *Intergovernmental Panel on Climate Change (IPCC). 2023. AR6 Synthesis Report Climate Change 2023.* ***https://www.ipcc.ch/report/ar6/syr/****. Accessed March 2025.*

1-2 below, affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry.[14] Climate change is already impacting both human and natural systems globally. Scientists have observed shrinking ice sheets, warming and acidifying oceans, rising global temperatures, reduced snow cover, and sea level rise.[15] These impacts pose significant risks and have led to widespread adverse impacts to nature and people, disproportionately affecting vulnerable communities who have historically contributed the least to current climate change.[16]

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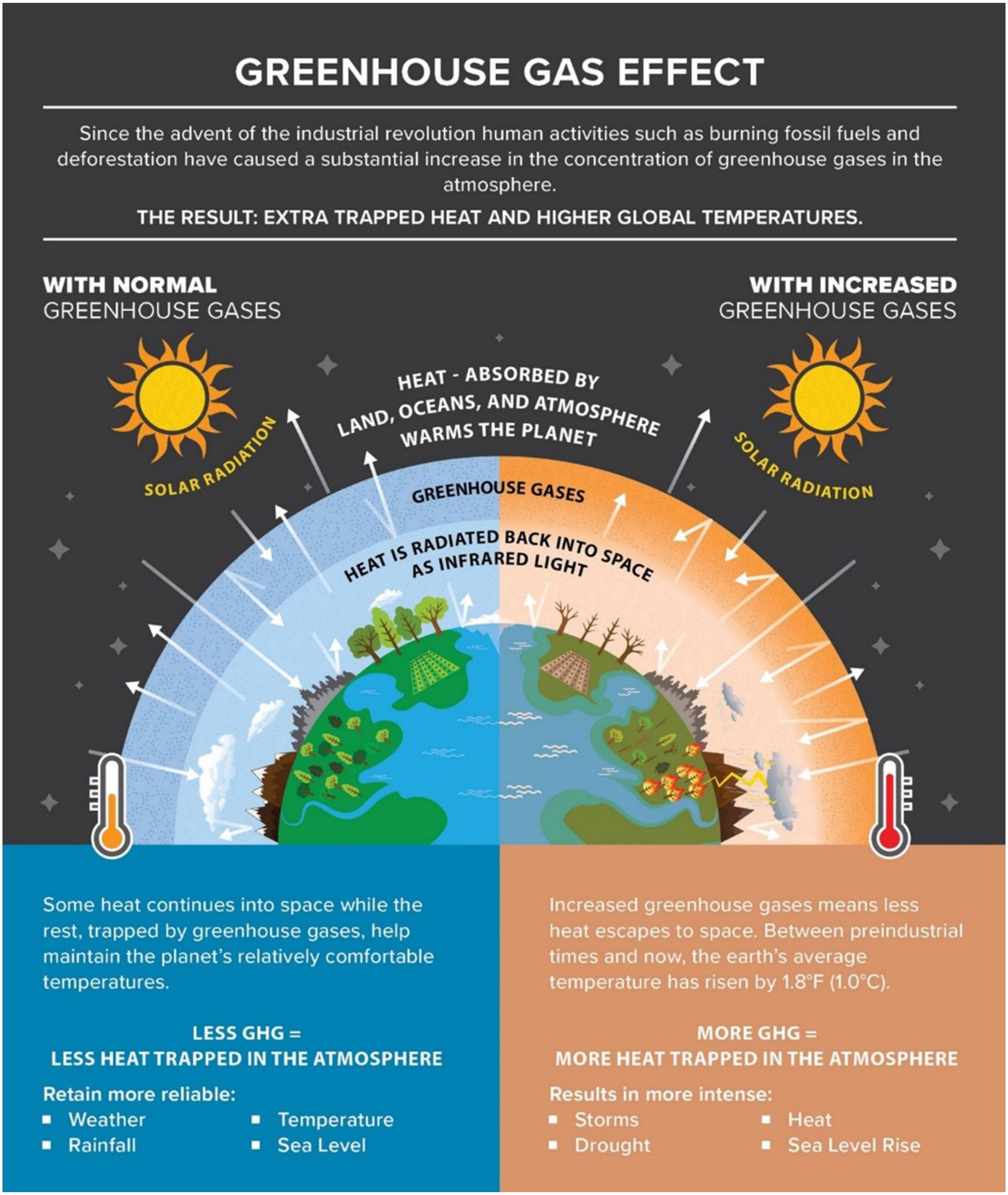
14. The National Aeronautics and Space Administration (NASA). 2022. The Effects of Climate Change. ***https://climate.nasa.gov/effects/****.*

15. Ibid.

16. I Intergovernmental Panel on Climate Change (IPCC). 2023. AR6 Synthesis Report Climate Change 2023. ***https://www.ipcc.ch/report/ar6/syr/****. Accessed March 2025.*

Figure 1-2. Greenhouse Gas Effect



Source: National Resources Defense Council, ***https://www.nrdc.org/stories/greenhouse-effect-101***

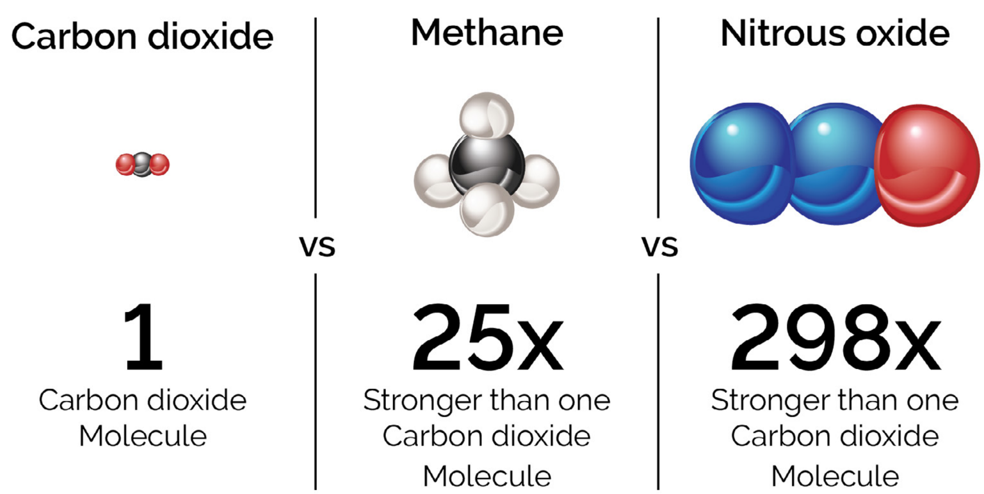
Although climate change is a global issue, the effects are intensely experienced at the local level, influencing numerous facets of society such as health outcomes, availability of natural resources, infrastructure durability, emergency response capabilities, tourism, and the frequency and intensity of disasters. According to the IPCC, reaching carbon neutrality by the middle of the century is crucial to preventing the most severe consequences of climate change. To achieve this vital objective, coordinated efforts are required across all societal levels to substantially cut GHG emissions.[17]

Types of Greenhouse Gas Emissions

The IPCC identifies several GHGs, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2o), along with chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, collectively known as fluorinated gases. In the United States, the majority of GHG emissions each year are composed of CO_2, CH_4, and N_2O, with fluorinated gases accounting for the remaining emissions. Since CO_2, CH_4, and N_2O make up the bulk of GHG emissions at the community level, these gases are the focus of this analysis.

Each GHG has a different capacity to trap heat in the atmosphere, referred to as global warming potential (GWP). The atmospheric lifespan of GHG varies, ranging from a decade to several thousand years. Due to the varying characteristics of GHGs, a standard unit is necessary to compare their potential impacts and aggregate them in an analysis This is done by converting all GHGs into a standard unit called carbon dioxide equivalent (CO_2e), based on the amount of heat one metric ton (MT) of CO_2 retains in the atmosphere. The GWP values for each GHG are sourced from the IPCC's Fourth Assessment Report (AR4) to align with the methodology used in the California Air Resources Board (CARB) State GHG inventory. While more recent GWP values are available (e.g., from the Fifth Assessment Report), using AR4 values provides consistency and allows for comparability with the State's GHG emissions data.[18] GHG global warming potential values are illustrated in Figure 1-3 below.[19]

Figure 1-3. Greenhouse Gas Global Warming Potentials



17. IPCC. "Summary for Policymakers — Global Warming of 1.5 C". Available: https://www.ipcc.ch/sr15/chapter/spm/.
18. IPCC. 2007. Climate Change 2007: Synthesis Report. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf; and California Air Resources Board (CARB). GHG Global Warming Potentials. Available: https://ww2.arb.ca.gov/ghg-gwps
19. Ibid.

California Environmental Quality Act Guidelines Consistency

This CAP, along with the related CEQA environmental assessment documentation, meets the criteria outlined in CEQA Guidelines Section 15183.5(b) to be recognized as a "qualified" GHG reduction plan. Table 1-1 details how this CAP addresses the CEQA Guidelines criteria to be deemed a qualified GHG reduction plan.

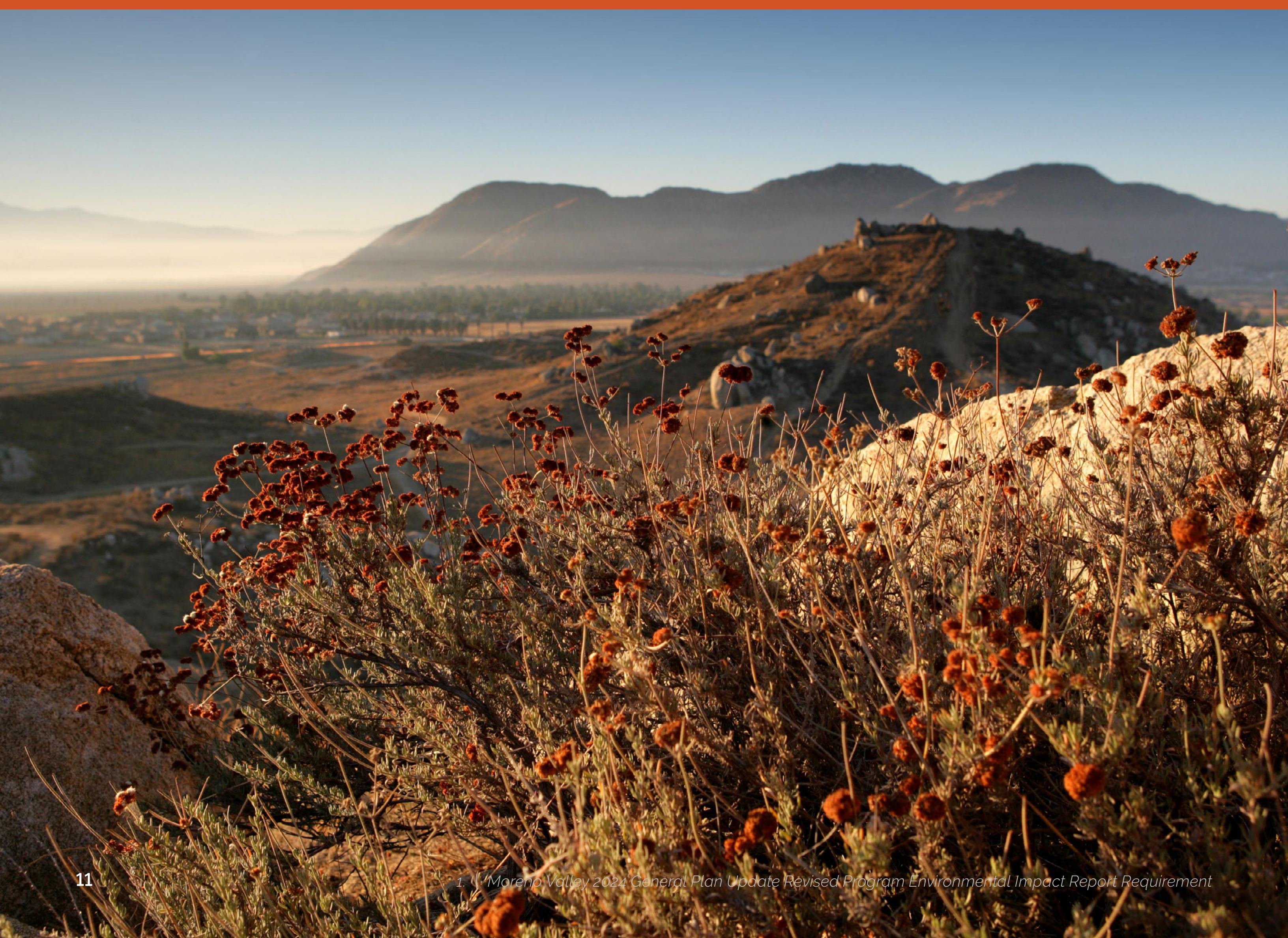
According to the CEQA Guidelines, local agencies are required to assess the environmental impacts of new development projects or plans, including those related to GHG emissions from both construction and operation. This evaluation process can be burdensome for local agencies and developers, often leading to project delays. However, the CEQA Guidelines offer a way to simplify the GHG emissions analysis for new projects by allowing them to build upon a qualified GHG reduction plan. This CAP is designed to be a tool for the community to guide contribution towards GHG emissions reduction and streamline CEQA analysis. To reduce burdens, developers have two pathways to prove projects are consistent with the CAP according to the City's direction: the City's CEQA GHG Emission Analysis Compliance Checklist (Appendix E) and the City's GHG Emissions Thresholds and Guidance Report (Appendix F).

Table 1-1. CEQA Guidelines Section 15183.5(b) Criteria Addressed in CAP

CEQA Criteria	CAP Chapter Addressing Criteria
1. Quantify existing and projected GHG emissions within the plan area	Chapter 2 Appendix B Appendix C
2. Establish a reduction target consistent with State targets	Chapter 2 Appendix C
3. Identify and analyze sector specific GHG emissions from specific actions or categories of actions anticipated within the geographic area	Chapter 2 Appendix B
4. Specify measures and actions that substantial evidence demonstrates would collectively achieve the specified reduction target	Chapter 3 Appendix D
5. Establish a mechanism to monitor progress and amend the plan if it is not achieving specified emissions levels	Chapter 4
6. Adopt in a public process following environmental review	Adopted with the 2024 General Plan Update (2024 GPU) during the public review process following environmental review in the associated Revised Program Environmental Impact Report (Revised EIR).

Moreno Valley 2024 General Plan Update Revised Program Environmental Impact Report Requirement

The Moreno Valley 2024 GPU and CAP are being prepared together and will be jointly adopted following environmental review in the associated Revised Program Environmental Impact Report (Revised EIR). The Moreno Valley CAP uses the same projections utilized in the Revised EIR, including demographic and vehicle miles traveled (VMT) projections. Using the same projections allows the CAP to align with the 2024 GPU. While the 2024 GPU extends through 2040, this CAP extends through 2045 to demonstrate substantial progress towards the State's 2045 goal for carbon neutrality established under AB 1279 (2022).



2.

GREENHOUSE GAS EMISSIONS ANALYSIS

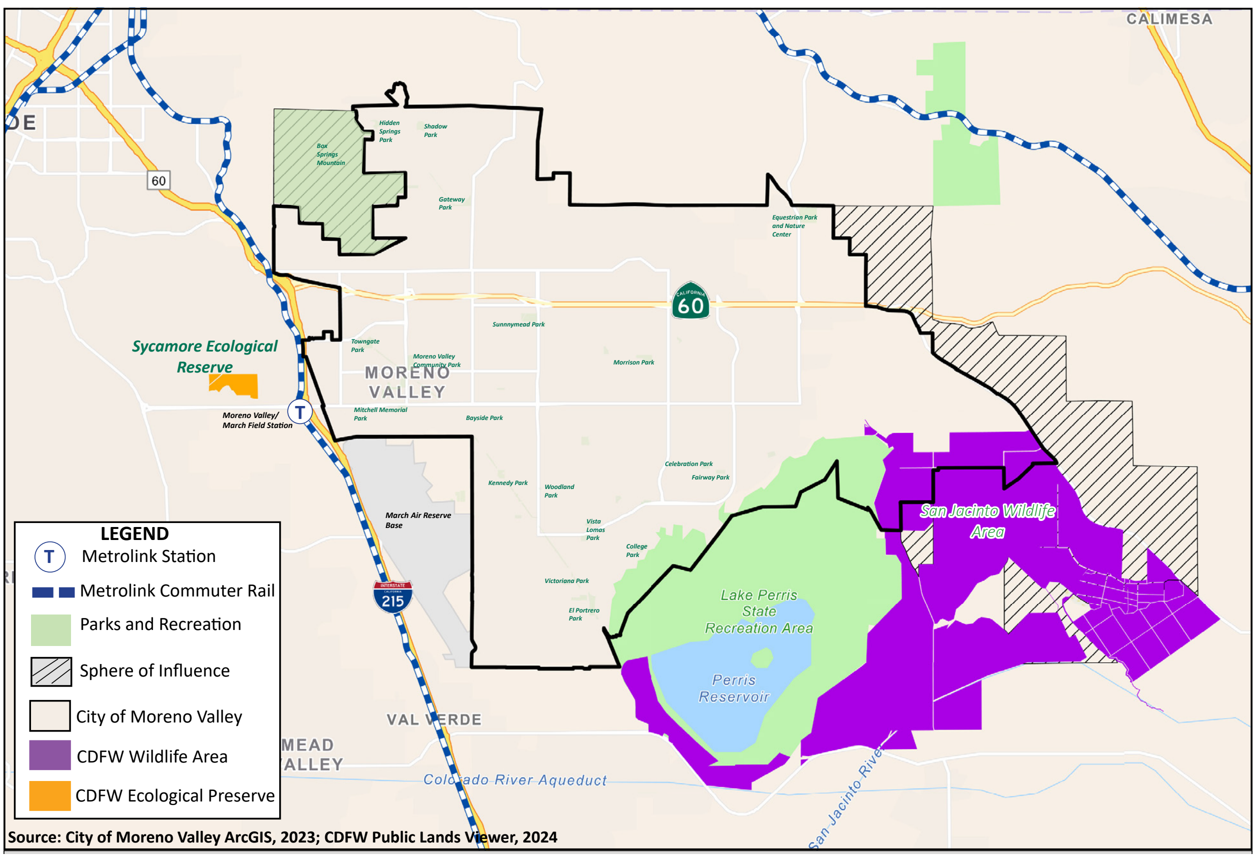
Community Greenhouse Gas Emissions Inventory

A key element of the climate action planning process is the development of a community wide GHG emissions inventory for a specific period of time, such as a calendar year. The City selected 2019 as the calendar year for Moreno Valley's community GHG emissions inventory because this was the year with most complete data available at the time of completion.[20] An inventory quantifies emissions from different sectors within a community, such as energy and transportation, to guide the development of the CAP. The inventory identifies the major sources of GHG emissions under the City's jurisdictional control and establishes a consistent baseline for monitoring GHG emissions reduction over time.

Greenhouse Gas Emissions Inventory Boundary

Moreno Valley's 2019 community GHG emissions inventory includes the emissions sources directly and indirectly influenced by activities occurring within the City of Moreno Valley's city limits boundary. The city limits boundary, as seen below in Figure 2-1, encompasses the geographical scope for which the City of Moreno Valley can make land use decisions and set policies to effectively reduce GHG emissions within the Moreno Valley community.

Figure 2-1. City of Moreno Valley



20. Selecting a pre-COVID-19 pandemic baseline year also avoids potential distortions in GHG emissions trends due to the temporary reductions in activity caused by the COVID-19 pandemic. Studies have shown that global daily GHG emissions in April 2020 were approximately 17 percent lower than in the same month of 2019, with the most significant reductions occurring in the transportation, manufacturing, and power generation sectors (Le Quéré et al., 2020).

Le Quéré et al., 2020. COVID-19 impact on an academic Institution's greenhouse gas inventory: The case of Cornell University. Accessed at: **https://www.sciencedirect.com/science/article/pii/S0959652622020418#bib13**

Greenhouse Gas Emissions Inventory Methodology

The inventory was created following the methodologies of the International Council for Local Environmental Initiatives (ICLEI), specifically using the United States Community Protocol for Accounting and Reporting Greenhouse Gas Emissions Version 1.2 (Community Protocol). The GHG inventory was conducted using the latest available data sources, emission factors, and Global Warming Potentials (GWP) from the Intergovernmental Panel of Climate Change's (IPCC) Fourth Assessment Report (AR4).[21] AR4 GWPs were selected to align with the methodology used in the CARB GHG inventory, allowing for consistency and comparability with State-level data.

Moreno Valley's community GHG emissions inventory emphasizes the three GHGs most pertinent to local government policy: CO_2, CH_4, and N_2O. These gases make up the majority of community GHG emissions. Other gases, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are mainly released through private sector manufacturing and electricity transmission. These are regulated at the State level and thus have been excluded from Moreno Valley's inventory. To allow for comparison across GHG emissions sources, all emissions are converted to the equivalent of one metric ton of carbon dioxide, or MT CO_2e. One MT CO_2e is the equivalent of using 113 gallons of gasoline or driving 2,568 miles in a standard combustion vehicle, as shown in Figure 2-2.[22]

Figure 2-2. Carbon Dioxide Equivalents

21. *Intergovernmental Panel on Climate Change (IPCC). AR4 Synthesis Report: Climate Change 2007.* ***https://www.ipcc.ch/report/ar4/syr/****. Accessed April 2025.*
22. *EPA. Greenhouse Gas Equivalencies Calculator. Available at:* ***https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator****. Accessed April 2025.*

Greenhouse Gas Emissions Inventory Sectors

The GHG inventory covers sectors related to the community activities within the City of Moreno Valley that the local government can control or influence. These sectors include:

- **Building Electricity:** Emissions from the consumption of electricity in residential and nonresidential buildings.
- **Building Natural Gas:** Emissions from the consumption of natural gas in residential and nonresidential buildings.[23]
- **On-road Transportation:** Emissions from the combustion of fossil fuels and use of electricity in passenger vehicles, commercial vehicles, and buses.
- **Off-road Equipment:** Emissions from the combustion of fossil fuels (i.e., diesel, gasoline, and natural gas) in off-road equipment.
- **Solid waste:** Emissions from the decomposition of waste generated by the community in landfills and the processing of such waste.
- **Water:** Emissions from the electricity used to extract, treat, convey, and distribute local and imported water.
- **Wastewater:** Emissions from wastewater treatment processing, discharge, and infrastructure.

Other sectors, like industrial and agricultural emissions, were excluded due to jurisdictional control limitations or State legislation considerations.[24] The included sectors follow the best practices outlined in the Community Protocol.

Summary of Greenhouse Gas Emissions Inventory Results by Sector

In 2019, Moreno Valley's community GHG inventory totaled approximately 1,257,593 MT CO_2e. Figure 2-3 and Table 2-1 below illustrate the distribution of total GHG emissions across sectors within the community. The main contributors to GHG emissions were on-road transportation, followed by electricity consumption and natural gas in buildings. The on-road transportation sector was the largest contributor to Moreno Valley's GHG emissions in 2019, accounting for 52 percent of total GHG emissions due to the combustion of gasoline and diesel by passenger and commercial vehicles. The second-largest GHG emissions source was building usage of electricity and natural gas, representing a combined 30 percent of the total. Within this sector, electricity contributed the majority of GHG emissions (51 percent), highlighting an opportunity for renewable energy sourcing. Solid waste contributed 13 percent and off-road equipment contributed four percent, while water and wastewater each contributed less than one percent. These findings emphasize the importance of addressing transportation, electricity use, and natural gas consumption as priority areas for future emissions reductions. Refer to Appendix B for more detail on the data and calculations used for the 2019 community GHG emissions inventory.

23. Buildings classified by the SCE and SCG as industrial or agricultural are excluded from the inventory as they are mainly regulated by State agencies. However, due to data limitations, the inventory includes Moreno Valley Utility Electricity consumption from all nonresidential customers (i.e. commercial, industrial, and agricultural customers).

24. The inventory excludes point source industrial emissions because these emissions activities are generally outside the jurisdictional control of the City and are instead regulated by the State's Cap-and-Trade program. The inventory also excludes Southern California Edison electricity consumption and natural gas consumption by industrial and agricultural customers in Moreno Valley. However, due to data limitations, the inventory includes Moreno Valley Utility Electricity consumption from all nonresidential customers (i.e. commercial, industrial, and agricultural customers).

Figure 2-3. Moreno Valley 2019 Community GHG Emissions Inventory Results by Sector

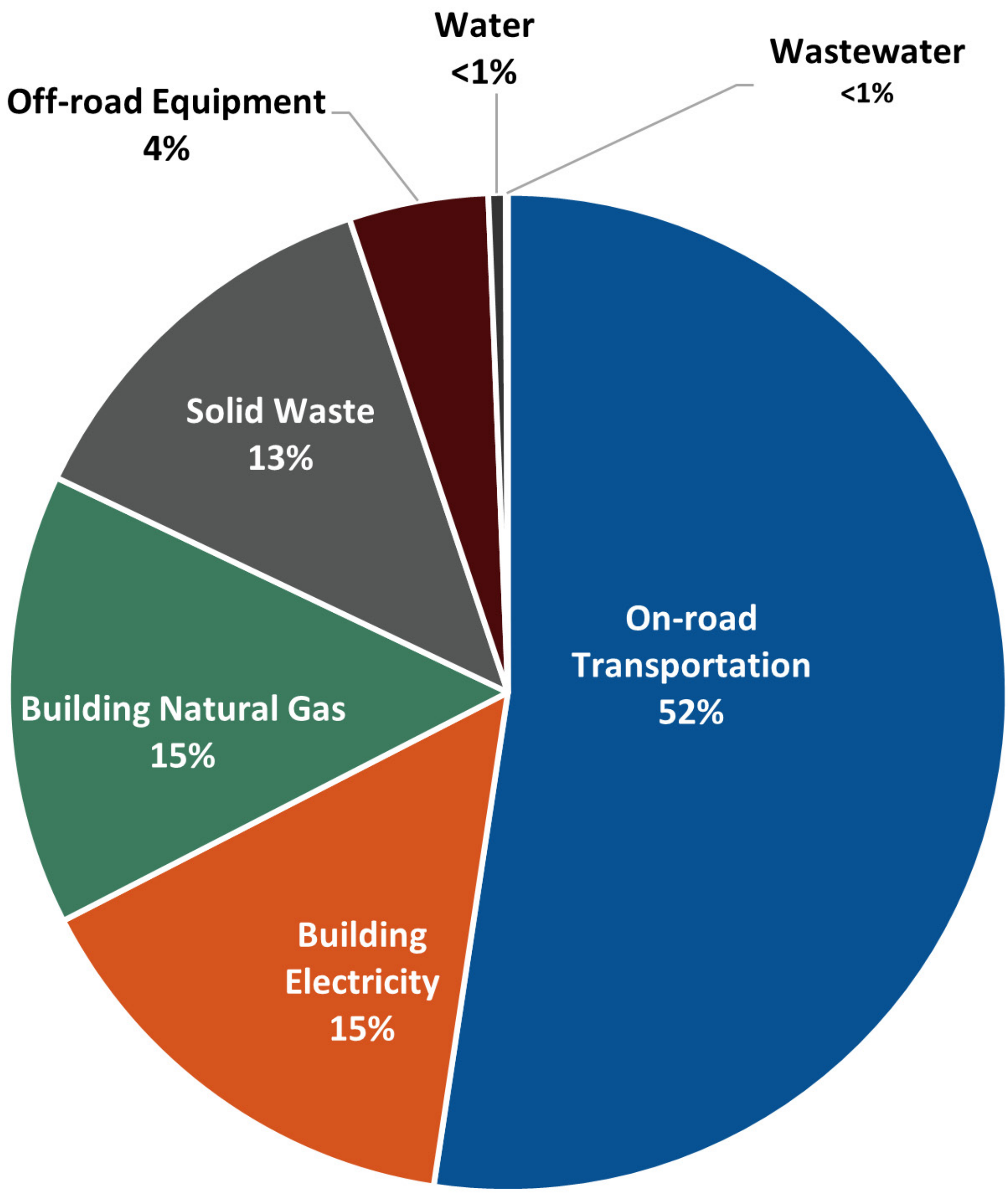


Table 2-1. Moreno Valley 2019 Community GHG Emissions Inventory Results by Sector

Emissions Sector	Emissions Sub Sector	Emissions (MT CO_2e)	Percent of Total
Building Electricity[1]	Residential Electricity	100,411	8%
	Nonresidential Electricity	89,112	7%
Building Natural Gas[2]	Residential Natural Gas	145,016	12%
	Nonresidential Natural Gas	38,919	3%
On-road Transportation	Passenger Total VMT	559,445	44%
	Commercial Total VMT	94,883	8%
	Bus Total VMT	3,135	0.2%
	Passenger EVMT	1,211	0.1%
	Commercial EVMT	0	0%
	Bus EVMT	5	<0.01%
Off-road Equipment	Off-road Equipment - Diesel	44,285	4%
	Off-road Equipment - Gasoline	10,943	1%
	Off-road Equipment - Natural Gas	1,445	0.1%
Solid Waste	Solid Waste Disposal	160,875	13%
Wastewater[3]	Wastewater	889	0.1%
Water	Imported Water Supply	7,020	0.6%
Total		**1,257,593**	**100%**

VMT = vehicle miles traveled; EVMT = electric vehicle miles traveled; MT CO_2e = metric tons of carbon dioxide equivalents. Values and percentages may not add up to totals or 100 percent due to rounding.

[1,2] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

[3] Wastewater sector includes wastewater process and fugitive emissions as well as wastewater electricity.

Greenhouse Gas Emissions Forecast and Targets

Moreno Valley Greenhouse Gas Emissions Forecasts

A GHG emissions inventory establishes a baseline emission total for a specific year, but annual GHG emissions fluctuate over time due to factors like population growth, job changes, new technologies, and legislation. The Moreno Valley GHG emissions forecast projects future emission changes based on forecasted changes in population and employment, as well as existing State and federal legislation aimed at reducing GHG emissions through 2045. For additional details on forecast methodology and results, reference Appendix C. This section provides estimates of future emissions for Moreno Valley under two scenarios: business-as-usual (BAU) and legislative-adjusted (adjusted).

- **Business-as-usual Forecast:** Provides a forecast of how future GHG emissions would change if current activities continued as they did in 2019 absent 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, consistent with Moreno Valley 2024 GPU projections.
- **Adjusted Forecast:** Provides a forecast of how currently adopted State legislation would reduce GHG emissions from the business-as-usual scenario. The legislative-adjusted scenario represents the State's contribution to reducing local GHG emissions to meet State 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 and the responsibility of the City for further GHG emissions reduction.

Business-as-Usual Forecast

Future GHG emissions were estimated by combining projected activity data with the baseline emission factors from the 2019 community GHG emissions inventory. Growth rates for various indicators were derived from 2019 activity data and applied to the demographic projections to forecast future activity data. These demographic projections include estimates for population, employment, and households as well as VMT. The estimates for Moreno Valley's projected population, employment, households, and VMT are based on growth rates outlined in the 2024 GPU, which aligns with Moreno Valley's 6th Cycle (2021-2029) Housing Element Update Sites Inventory Assessment. The employment projections are based on the Western Riverside Council of Government's Riverside County Transportation Model (RIVCOM).[25]

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 Moreno Valley. Table 2-2 provides a summary of the BAU GHG emissions results for each GHG emissions sector for 2024,[26] 2030, 2035, 2040, and 2045.

25. *Western Riverside Council of Governments. RIVCOM.* ***https://wrcog.us/320/Transportation-Modeling-Services***

26. *The baseline year for the Moreno Valley 2024 General Plan is 2024. Since activity data for 2024 was unavailable when this report was prepared, GHG emissions for 2024 were projected based on 2019 data.*

Table 2-2. BAU GHG Emissions Forecast Results by Sector (MT CO_2e)

GHG Emissions Sector	2019 (GHG Inventory)	2024	2030	2035	2040	2045
Building Energy	**373,457**	**463,865**	**572,354**	**662,762**	**753,170**	**843,577**
Residential Electricity[1]	100,411	125,379	155,340	180,309	205,277	230,245
Nonresidential Electricity[1]	89,112	109,554	134,085	154,527	174,970	195,412
Residential Natural Gas[2]	145,016	181,085	224,368	260,437	296,506	332,575
Nonresidential Natural Gas[2]	38,919	47,848	58,561	67,490	76,418	85,346
Transportation	**715,352**	**827,048**	**965,906**	**1,081,862**	**1,197,780**	**1,313,660**
Passenger Total VMT[3]	560,656	641,904	739,403	820,652	901,901	983,150
Commercial Total VMT[3]	94,883	126,195	163,770	195,082	226,394	257,707
Buses Total VMT[3]	3,140	3,703	4,378	4,941	5,504	6,067
Off-road Equipment	56,673	55,245	58,354	61,186	63,980	66,736
Solid Waste	**160,875**	**189,721**	**224,336**	**253,181**	**282,026**	**310,872**
Solid Waste Disposal	160,875	189,721	224,336	253,181	282,026	310,872
Wastewater	**889**	**1,048**	**1,240**	**1,399**	**1,558**	**1,718**
Wastewater Process and Fugitive Emissions	792	934	1,104	1,246	1,388	1,530
Wastewater Electricity1	97	115	136	153	171	188
Water	**7,020**	**8,279**	**9,789**	**11,048**	**12,306**	**13,565**
Imported Water Supply	7,020	8,279	9,789	11,048	12,306	13,565
Total GHG Emissions	**1,257,593**	**1,489,961**	**1,773,624**	**2,010,251**	**2,246,840**	**2,483,392**

All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). VMT = vehicle miles traveled. Values may not add up to totals due to rounding.

[1, 2] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

[3] Passenger, Commercial, and Bus Total VMT include GHG emissions from electric vehicle miles traveled (EVMT).

Adjusted Forecast

Several State regulations have been implemented to lower Moreno Valley's GHG emissions below the BAU forecasted levels for the years 2024, 2030, 2035, 2040, and 2045. The effects of these regulations were measured and included in the adjusted forecast to give a more precise picture of future emissions changes and Moreno Valley's GHG reduction responsibilities. The adjusted forecast incorporates State legislation aimed at reducing GHG emissions from transportation, building energy efficiency, and renewable electricity. Table 2-3 provides a brief overview of each regulation included in Moreno Valley's adjusted GHG emissions forecast.

Table 2-3. State Regulations, Codes, and Programs Included in Adjusted GHG Emissions Forecast

Metric	Regulations, Codes, and Programs	Description
California Renewables Portfolio Standard (RPS)	SB 1078 (2002)	Established California's RPS, requiring electricity providers (i.e., utilities, cooperatives, and community choice aggregators) to increase the amount of electricity generated from eligible renewable resources by at least one percent per year, reaching 20 percent by 2017.
	SB 350 (2015)	Expanded RPS to require 50 percent eligible renewable electricity by 2030.
	SB 100 (2018)	Accelerated RPS to require 60 percent eligible renewable electricity by 2030 and set a goal of 100 percent carbon-free electricity retail sales by 2045.
	SB 1020 (2022)	Established interim eligible renewable electricity targets of 90 percent by 2035 and 95 percent by 2040, reinforcing the 100 percent clean electricity mandate by 2045 set by SB 100 (2018).
Title 24 of the California Code of Regulations (Title 24, 2022)	2022 Building Energy Efficiency Standards	Updated Title 24 (2022) standards to support building decarbonization through stronger efficiency requirements, expanded solar and battery storage mandates, and the inclusion of electric-ready provisions for new construction.
Transportation	Advanced Clean Cars Program (2012)[1]	An emissions-control 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.
	Advanced Clean Trucks (2020)[2]	Sets a zero-emission vehicle (ZEV) percent-of-sales requirement on medium- and heavy- duty vehicle manufacturers to promote increased truck ZEV sales from 2024 to 2035.
	AB 1493 (2002)	Known as the "Pavley Standards" and requires vehicle manufacturers to reduce GHG emissions from new passenger vehicles and light trucks from 2009 through 2016.
	Innovative Clean Transit (2018)	Requires all public transit agencies to gradually transition to a 100 percent zero-emission bus fleet.

Notes: RPS = Renewable Portfolio Standard; SB = Senate Bill; ZEV = zero-emission vehicle; AB = Assembly Bill.

[1] The Advanced Clean Cars II Program was approved by CARB in 2022 and expands the program's roadmap so that by 2035 all new cars and passenger trucks will be ZEVs. While the program update will lead to an expedited timeline for ZEV adoption in California compared to the initial Advanced Clean Cars Program (2012), modeling data is not yet available. GHG emissions reduction attributable to the Advanced Clean Cars II Program was, therefore, excluded from Moreno Valley's adjusted GHG emissions forecast.

[2] 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.

In the resulting adjusted GHG emissions forecast, the electricity sector shows a significant decline, reaching zero by 2045 due to strict Renewables Portfolio Standard (RPS) mandates from SB 100 (2018) and SB 1020 (2022). Conversely, natural gas emissions are projected to rise until 2045, driven by growth in housing and employment. This increase is somewhat mitigated by the more rigorous efficiency standards for new residential buildings under Title 24 of the California Code of Regulations (Title 24, 2022). Transportation emissions are anticipated to vary between 2019 and 2045. While current regulations will lower GHG emissions until around 2025 or 2030, the impact of these standards will diminish over time, and with rising VMT, the pace of emissions reduction in the transportation sector will decelerate as 2045 approaches. Emissions from wastewater and solid waste are expected to grow through 2045, with the growth in population. A summary of the reductions from the BAU forecast that can be expected under the adjusted forecast are provided in Table 2-4 below. More detailed projected GHG emissions under the adjusted forecast by sector and year through 2045 can be found in Table 2-5 below.

Table 2-4. Legislative Reductions Considered in Adjusted GHG Emissions Forecast (MT CO_2e)

Metric	2024	2030	2035	2040	2045
California RPS	40,573	105,262	259,985	315,695	375,117
Title 24 (2022)	21,705	47,780	69,946	91,901	113,915
Transportation Legislation (Advanced Clean Cars Program, 2012; Advanced Clean Trucks, 2020; Pavley Standards, 2002; Innovative Clean Transit, 2018)	67,398	179,896	260,095	323,390	371,058
Total	**129,676**	**332,937**	**590,026**	**730,986**	**860,091**

All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). RPS = Renewables Portfolio Standard. Values may not add up to totals due to rounding.

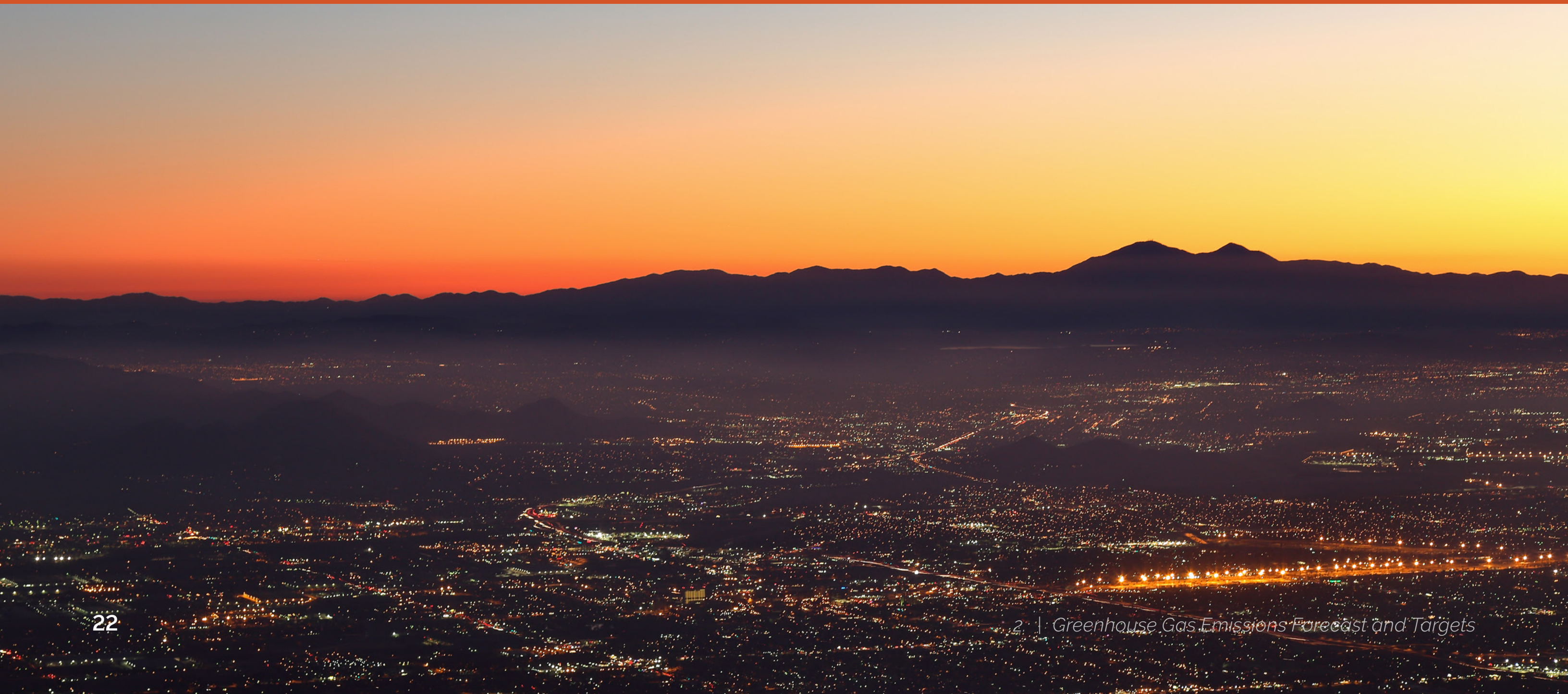


Table 2-5. Adjusted GHG Emissions Forecast Results by Sector (MT CO_2e)

GHG Emissions Sector	2019 (GHG Inventory)	2024	2030	2035	2040	2045
Building Energy	**373,457**	**404,213**	**428,976**	**361,800**	**385,318**	**404,791**
Residential Electricity[1,2]	100,411	92,697	77,924	21,318	11,573	0
Nonresidential Electricity[1,2]	89,112	85,109	73,678	20,636	11,426	0
Residential Natural Gas[3]	145,016	178,560	218,813	252,357	285,901	319,445
Nonresidential Natural Gas[3]	38,919	47,848	58,561	67,490	76,418	85,346
Transportation	**715,352**	**758,601**	**780,447**	**802,355**	**846,207**	**906,109**
Passenger Total VMT[4]	560,656	575,603	573,831	584,621	614,935	656,092
Commercial Total VMT[4]	94,883	124,140	144,907	153,458	164,929	181,631
Buses Total VMT[4]	3,140	3,613	3,355	3,090	2,362	1,650
Off-Road Equipment	56,673	55,245	58,354	61,186	63,980	66,736
Solid Waste	**160,875**	**189,721**	**224,336**	**253,181**	**282,026**	**310,872**
Solid Waste Disposal	160,875	189,721	224,336	253,181	282,026	310,872
Wastewater	**889**	**1,027**	**1,183**	**1,268**	**1,400**	**1,530**
Wastewater Process and Fugitive Emissions	792	934	1,104	1,246	1,388	1,530
Waste Water Electricity[1,2]	97	93	79	22	12	0
Water	**7,020**	**6,724**	**5,744**	**1,621**	**903**	**0**
Imported Water Supply[1]	7,020	6,724	5,744	1,621	903	0
Total	**1,257,593**	**1,360,285**	**1,440,687**	**1,420,225**	**1,515,855**	**1,623,302**

All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). Values may not add up to totals due to rounding.

[1] Emissions are estimated to reduce to zero MT CO_2e due to RPS requirements established by SB 100 (2018) and SB 1020 (2022) which specify electricity must be procured from 100 percent renewable and carbon free sources by 2045.

[2,3] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

[4] Passenger, Commercial, and Bus Total VMT include GHG emissions from electric vehicle miles traveled (EVMT).

Moreno Valley 2030 and 2045 Greenhouse Gas Emissions Targets

The goal of setting GHG emissions reduction targets is to create a pathway to meet California's climate objectives while accounting for Moreno Valley's anticipated growth. Over the past 20 years, California has implemented various laws, regulations, policies, and programs to cut GHG emissions, becoming a leader in climate action. CARB recommends that local jurisdictions establish community-wide GHG reduction targets that support the State's goals and contribute to limiting cumulative climate impacts. Key legislation guiding California's climate action includes SB 32 (2016) and AB 1279 (2023), which set Statewide GHG reduction goals for 2030 and 2045:

- **Senate Bill 32 (2016):** Mandates a 40 percent reduction in Statewide GHG emissions below 1990 levels by 2030. CARB's 2017 Climate Change Scoping Plan outlines the path to achieve this goal.
- **Assembly Bill 1279 (2023):** Requires California to achieve carbon neutrality no later than 2045, defined as an 85 percent reduction in Statewide GHG emissions. CARB's 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) details the strategy to meet this goal.

Moreno Valley's 2030 and 2045 GHG emissions targets were set in relation to 1990 GHG emissions levels to align with California's legislative requirements. Because a GHG emissions inventory does not exist for Moreno Valley in 1990, historical emissions levels were estimated using a State-level emissions change metric. The resulting 1990 emissions level is presented in Table 2-6. For additional details on the 1990 backcast, reference Appendix C. With the estimated 1990 emissions levels, targets can be set in comparison to 1990 levels and the GHG forecasts to determine the GHG emissions reduction needed through local action.

Recognizing Moreno Valley's significant projected population and economic growth, Moreno Valley's GHG emissions targets have been established using an efficiency-based approach (i.e., per capita GHG emissions). CARB's 2017 Scoping Plan recommends the use of per capita targets for local jurisdictions expecting significant growth. This recommendation recognizes that California must accommodate population and economic growth and not penalize communities which are growing at significant rates.[27,28]

To align with the State's goals and recommendations, Moreno Valley's target pathway reduces per capita GHG emissions in a straight line from 2019 levels to net zero by 2045. This pathway equates to reducing per capita GHG emissions to 4.11 MT CO_2e per person by 2030 and to net zero emissions in 2045. This pathway exceeds SB 32 (2016)'s 2030 target by achieving a 65 percent reduction in per capita emissions below 1990 levels by 2030 and makes substantial progress toward AB 1279 (2023)'s carbon neutrality goal. The per capita target pathway is translated to mass emissions for ease of comparison to the GHG forecasts and tracking against GHG emissions inventory updates. Table 2-6 and Figure 2-4 summarize the target pathway and the associated GHG emissions reduction gap. The gap represents the GHG emissions reduction that Moreno Valley must meet through local action.

The next chapter presents the strategies Moreno Valley will implement to achieve the 2030 target and make substantial progress towards the 2045 target for carbon neutrality through local action.

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27. *California Air Resources Board. California's 2017 Climate Change Scoping Plan.* ***https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf***.

28. *Moreno Valley's per capita GHG emissions reduction targets were also developed based on sector-specific, local GHG data that was translated to a per capita basis based on population. This target-setting methodology is consistent with the 2022 Scoping Plan which recommends that jurisdictions develop locally appropriate, plan-level targets.*

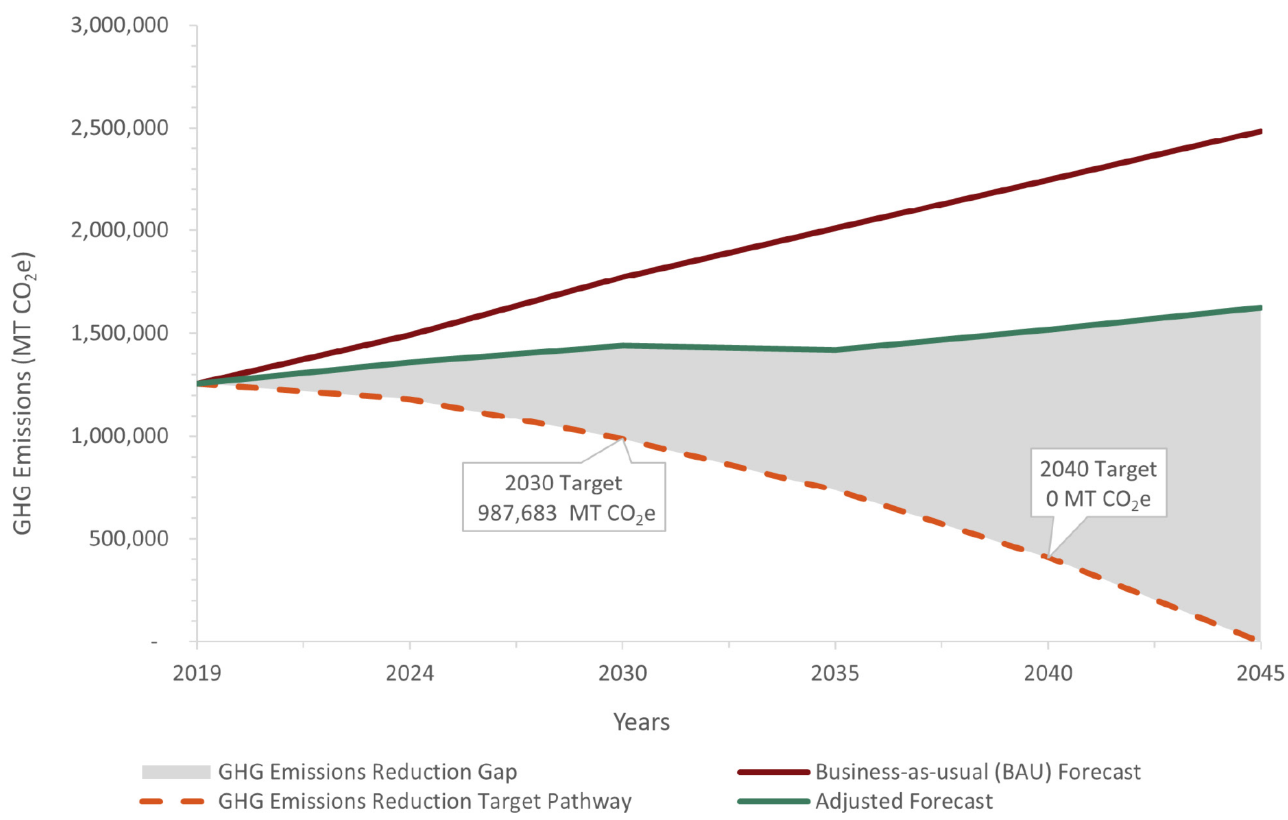
Table 2-6. Moreno Valley GHG Emissions Reduction Target Pathway and Gap Analysis

Emissions Forecast or Pathway	1990	2019	2024	2030	2035	2040	2045
Adjusted Forecast (MT CO_2e)	1,401,312	1,257,593	1,360,285	1,440,687	1,420,225	1,515,855	1,623,302
Population	118,779	176,614	205,620	240,428	269,434	298,440	327,446
Per Capita Adjusted Forecast (MT CO_2e/person)	11.80	7.12	6.62	5.99	5.27	5.08	4.96
Target Pathway in Per Capita Emissions (MT CO_2e/person)1	11.80	7.12	5.75	4.11	2.74	1.37	0
Percent Reduction Below 1990 Per Capita Levels	0%	40%	51%	65%	77%	88%	100%
Target Pathway in Mass Emissions (MT CO_2e)	1,401,312	1,257,593	1,182,571	987,683	737,895	408,667	0
Remaining Emissions Reduction Gap (MT CO_2e)	0	0	177,715	453,003	682,330	1,107,188	1,623,302

MT CO_2e = Metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

[1] The target pathway is calculated by reducing 2019 per capita emissions in a straight line to net zero per capita emissions in 2045. This provisional target pathway exceeds SB 32 (2016) and is consistent with a trajectory set forth to achieve AB 1279 (2023).

Figure 2-4. Moreno Valley GHG Emissions Reduction Target Pathway and Gap Analysis



MORENO VALLEY
WHERE DREAMS SOAR

3.

GREENHOUSE GAS EMISSIONS REDUCTION STRATEGY

Measure Framework

Greenhouse Gas Reduction Measures Overview

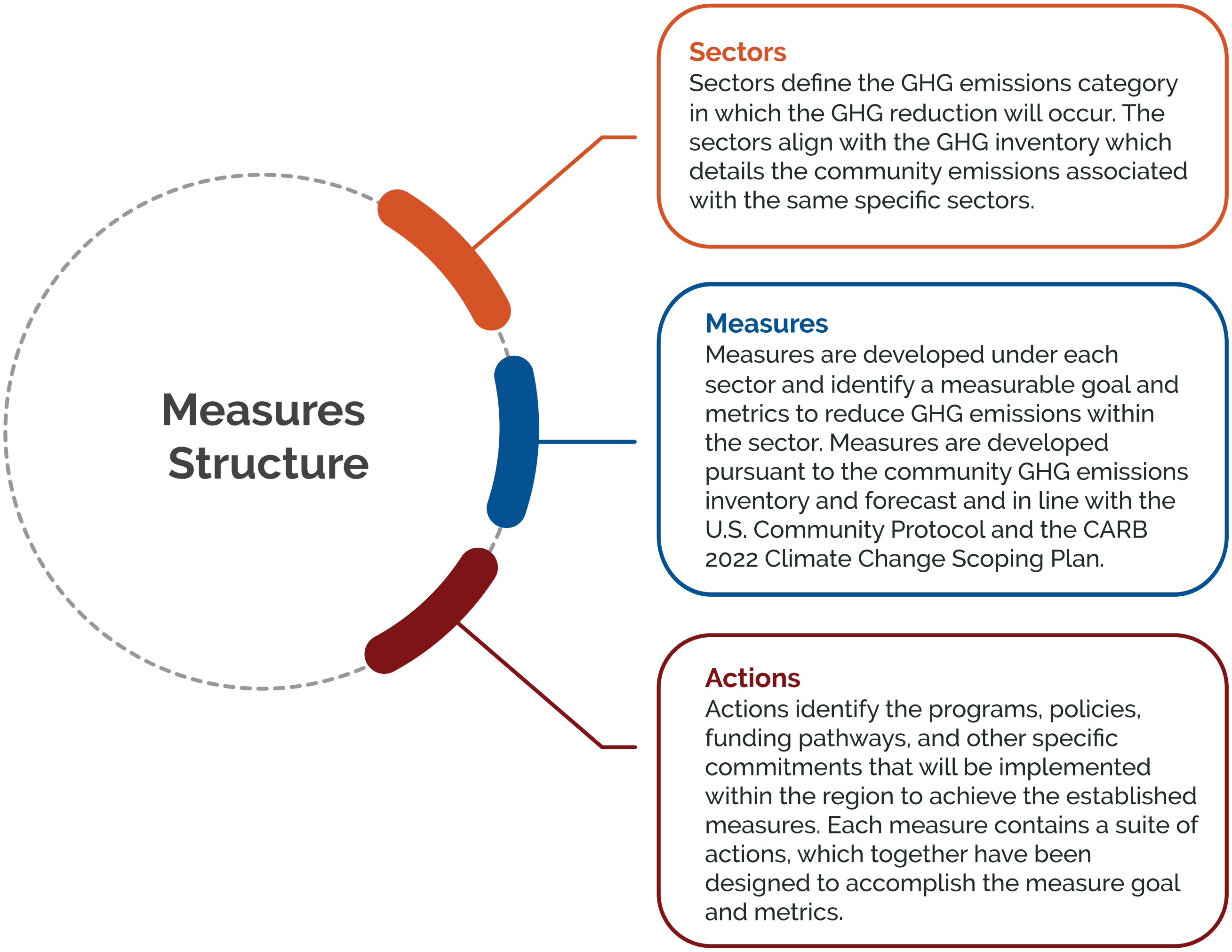
The City has created a set of GHG emissions reduction measures to guide the community in reducing and sequestering emissions to achieve Moreno Valley's 2030 target and make substantial progress towards the 2045 target for carbon neutrality. Most measures aim to reduce GHG emissions by preventing them from being released during energy and water use, transportation, and waste generation. Some measures, like the Carbon Sequestration measures, focus on capturing and storing carbon dioxide from the atmosphere. These measures are crucial for both the State's and Moreno Valley's long-term target of carbon neutrality because they aim to offset emissions from hard-to-decarbonize sectors.

The measures target various community sectors. Building Energy measures include transitioning buildings to electric systems, increasing access to renewable electricity, and enhancing energy efficiency in buildings. Transportation measures involve encouraging active transportation, improving public transit, and increasing access to public transit through multi-modal transportation[29] to reduce VMT while promoting the transition to zero-emission vehicles (ZEV). Solid Waste measures focus on reducing the organic waste sent to landfills, while Water and Wastewater measures aim to reduce water consumption and wastewater generation. Carbon Sequestration measures include applying compost to community lands and expanding Moreno Valley's urban forest.

By leveraging these opportunities, Moreno Valley will not only align with the State's climate goals but also benefit from new funding opportunities, regional partnerships, and climate action co-benefits. This chapter outlines the strategies, measures, and actions needed for significant GHG emissions reduction, organized according to the hierarchy shown in Figure 3-1.

29. *Multi-modal transportation refers to all modes of transportation including cars, bicycles, walking, buses, rail, and micromobility like e-bikes and scooters. A fully multi-modal transportation system allows people easy access to public transit and transition between transportation modes.*

Figure 3-1. Moreno Valley's Climate Action Measure Structure



Measures and actions are classified as either quantitative or supportive relative to GHG emissions reduction. The terms are defined as follows:

- **Quantitative:** Quantitative measures and actions result in quantifiable GHG emissions reduction when implemented. GHG emissions reduction from these measures and actions are supported by case studies, scientific articles, calculations, or other third-party substantial evidence.
- **Supportive:** Supportive measures and actions may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction. However, due to one of several factors – including a low/no GHG reduction benefit, indirect GHG reduction benefit, or potential for double-counting– they have not been quantified and do not contribute directly to the expected GHG emissions reduction target and consistency with the State goals. Despite not being quantified, supportive measures and actions are nevertheless critical to the overall success of the CAP and provide support so that the quantitative measures and actions will be successfully implemented.

Climate Action Attributes

For community-focused climate action to be effective and achievable, there often is a need for measures to be activated and guided by multiple attributes. Moreno Valley's CAP is built on six attributes crucial for successful implementation. Each measure is designed to encompass the six attributes. These attributes are defined below in Figure 3-2.

Figure 3-2. Moreno Valley Climate Action Attributes

Structural Change: Actions that establish a program, policy, or ordinance to allow the City to reach the goal or metric within a measure.

Engagement: Actions that foster community buy-in, promote the existence of programs, policies, and ordinances, and educate interested parties (e.g., educational events or materials).

Equity: Actions that engage disadvantaged communities in the decision-making process and establish policies and programs to provide equal access to benefit from each measure's objectives and avoid inequitable burdens or cost across the community.

Feasibility Study: Actions that help the City understand the details, obstacles, feasibility, or implementation of a program (e.g., analysis necessary to identify the best path or the feasibility of implementing a specific measure).

Funding: Actions that provide the City with the financial backing to establish, implement, and maintain programs (e.g., grants or rebates that help pay for the implementation of a measure, funding to adequately pursue and staff the program).

Partnership: Actions that establish partnerships with community-based organizations or agencies that are well-positioned to help with the implementation of a measure's actions through their expertise, resources, and networks.

Climate Action Co-Benefits

While this CAP focuses on GHG emissions reduction, the measures were designed to produce additional co-benefits beyond GHG emissions reduction that the community will see from implementing the CAP. These co-benefits will have long-term positive impacts that will help Moreno Valley work towards its vision. The co-benefits identified for each CAP measure include the following:

- Local Economic Development and Job Creation
- Cleaner Air and Healthier Communities
- Community Mobility Improvements
- Enhanced Community Character
- Community and Business Resilience

Greenhouse Gas Reduction Measure Summary

Table 3-1 presents the measures associated with each sector of the CAP and outlines the GHG emissions reduction and co-benefits associated with each measure.

Table 3-1. Moreno Valley GHG Reduction Measures Summary

Measure Identifier	Measure Text	2030 GHG Emission Reduction (MT CO_2e)	2045 GHG Emission Reduction (MT CO_2e)	Co-benefits
Strategy C: Cornerstone to Climate Action Planning				
Measure C-1	Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along SR-60 to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with California Air Resources Board's Advanced Clean Fleets regulation.	Supportive	Supportive	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community and Business Resilience
Strategy BE: Building Energy				
Measure BE-1	Procure 70% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.	13,399	0[1]	• Cleaner Air and Healthier Communities
Measure BE-2	Decarbonize new residential construction by at least 95% by 2026.	19,522	121,094	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-3	Decarbonize new nonresidential construction by at least 95% by 2026.	5,106	32,231	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-4	Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% by 2030 and 31% by 2045.	11,305	134,341	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities

Measure Identifier	Measure Text	2030 GHG Emission Reduction (MT CO_2e)	2045 GHG Emission Reduction (MT CO_2e)	Co-benefits
Measure BE-5	Decarbonize existing nonresidential buildings to reduce existing non-residential natural gas consumption by 3.8% by 2030 and 18% by 2045.	1,645	24,125	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-6	Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.	Supportive	Supportive	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community and Business Resilience
Strategy T: Transportation				
Measure T-1	Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.	2,352	6,079	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community Mobility Improvements • Enhanced Community Character
Measure T-2	Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.	9,767	59,435	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community Mobility Improvements • Enhanced Community Character
Measure T-3	Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce commuter vehicle miles traveled.	61,426	125,963	• Cleaner Air and Healthier Communities • Community and Business Resilience
Measure T-4	Achieve zero-emission vehicle adoption rates of 35% for passenger vehicles and 20% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.	111,067	646,245	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities

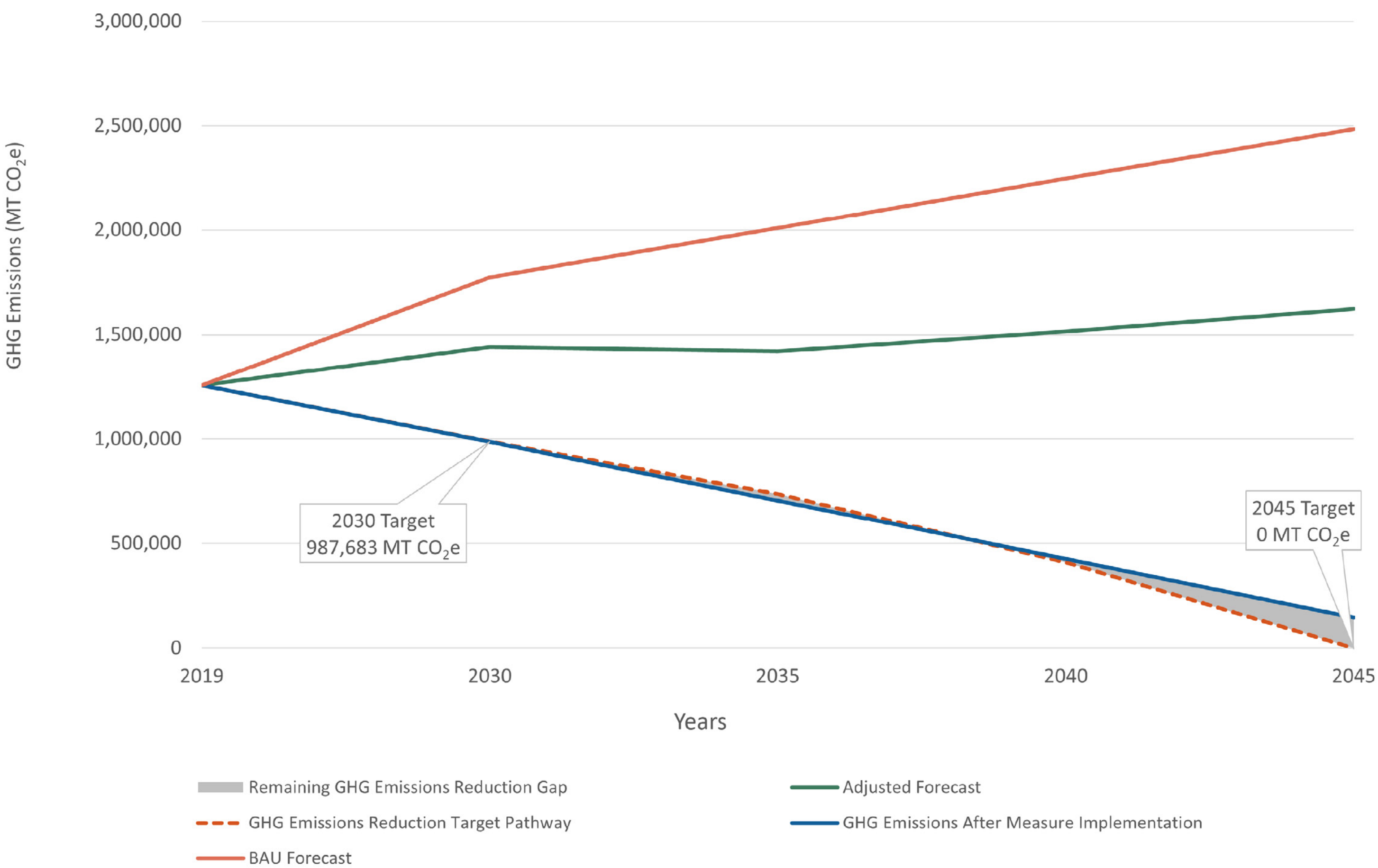
Measure Identifier	Measure Text	2030 GHG Emission Reduction (MT CO_2e)	2045 GHG Emission Reduction (MT CO_2e)	Co-benefits
Measure T-5	Implement programs to support California Air Resources Board and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.	18,335	38,918	• Cleaner Air and Healthier Communities
Strategy SW: Solid Waste				
Measure SW-1	Achieve, monitor, and maintain Senate Bill 1383 (2016) requirements to reduce waste sent to landfills by 75% below 2014 levels by 2030.	195,661	282,198	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Strategy WW: Water and Wastewater				
Measure WW-1	Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.	Supportive	Supportive	• Cleaner Air and Healthier Communities • Community and Business Resilience
Strategy CS: Carbon Sequestration				
Measure CS-1	Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve Senate Bill 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.	4,424	6,025	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Enhanced Community Character • Sustainable Resource Management • Community and Business Resilience
Measure CS-2	Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.	106	1,487	• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Enhanced Community Character • Community and Business Resilience
Total		**454,115**	**1,478,141**	

MT CO_2e = Metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

[1] SB 100 (2018) 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_2e per kilowatt-hour (kWh), resulting in no additional reductions for Measure BE-1 beyond the State-mandated baseline.

By strategically implementing the measures, and actions outlined in this CAP, Moreno Valley is positioned to reduce its communitywide GHG emissions by approximately 454,115 MT CO_2e by 2030. As shown in Figure 3-1, this level of reduction meets Moreno Valley's near-term 2030 target and, if sustained, places Moreno Valley on track to reduce emissions to an estimated 145,161 MT CO_2e by 2045. This approach will enable Moreno Valley to make meaningful progress toward carbon neutrality. See Appendix D for details on the calculations and substantial evidence used to quantify the GHG emissions reduction of each measure.

Figure 3-3. Moreno Valley's Greenhouse Gas Emissions Reduction Pathway



Cornerstone Sector

As the Cornerstone measure, Measure C-1 exemplifies the key attributes of climate action—feasibility, funding, structural change, partnerships, engagement, and equity—and demonstrates how bold yet practical climate solutions can align with the Moreno Valley's goals for sustainable economic development. Moreno Valley's vibrant business community and strategic location near business and transportation centers—including Los Angeles, Orange, and San Diego Counties—make it well-suited to support the region's cargo and distribution industry and the State's efforts to decarbonize transportation. With these characteristics, it is no surprise that the California Transportation Commission's (CTC) Clean Freight Corridor Efficiency Assessment lists SR-60 as a "priority freight corridor" and recommends a hydrogen refueling station be built in Moreno Valley.[30] The Cornerstone measure leverages this opportunity to make Moreno Valley a leader amongst the State's efforts to decarbonize transportation. The Cornerstone measure aims to establish a medium- and heavy-duty (MDHD) ZEV refueling depot along the SR-60 corridor. This MDHD ZEV depot will supply hydrogen, electricity, and/or other clean fuels to power the region's trucks, helping meet the State's growing demand for zero-emission MDHD freight transport. Such a depot will not only attract climate-resilient industries to Moreno Valley but also provide meaningful jobs to Moreno Valley's robust workforce.

Measure C-1 aims to build this MDHD refueling depot by employing each of the key climate action attributes. The City will build upon the CTC's Clean Freight Corridor Efficiency Assessment to conduct feasibility studies to analyze the MDHD ZEV market and analyze specific sites in Moreno Valley for the MDHD ZEV depot. With the results of these studies, the City will complete structural changes to streamline the permitting process for the MDHD ZEV depot and pursue funding from State programs to finance the construction and early operation of the depot. Likewise, the City will engage with the community to train the local workforce to support ZEV fleets and instrasturcutre—including the construction, operation, and maintance of the depot—and both address equity concerns and community build support for the depot. Such iniatives will be supported through regional partnerships and private sponsors to build a network of capacity and support for the MDHD ZEV depot.

30. California Transportation Commission (CTC). SB 671 Clean Freight Corridor Efficiency Assessment (2023). Accessed at: ***https://catc.ca.gov/-/media/ctc-media/documents/programs/sb671/sb671-final-clean-freight-corridor-efficiency-assessment-dor.pdf***.

Table 3-2. Cornerstone Measures and Actions Table

Cornerstone		
Measure/ Action Number	**Pillar**	**Action**
Measure C-1	**Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along the SR-60 corridor to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with California Air Resources Board's Advanced Clean Fleets regulation.**	
C-1a	Feasibility Study	Review and assess California Transportation Commission's (CTC) Clean Freight Corridor Efficiency Assessment, which lists SR-60 as a "priority freight corridor" and recommends a hydrogen refueling station in Moreno Valley; build off existing analyses to conduct a site-specific feasibility study which would include: **1. Market Analysis** • **Demand Forecasting:** Analysis of current and future demand for zero-emission vehicle (ZEV) refueling among MDHD vehicles. This includes understanding the growth of ZEV fleets, trucking routes, and regional freight volumes. • **Competitive Landscape:** Assessment of existing and planned ZEV refueling stations in the area, including electric charging stations and hydrogen refueling stations. This should cover the types of services offered, pricing models, and utilization rates. • **Policy and Regulatory Environment:** Examination of federal, State, and local regulations and incentives that impact ZEV adoption and refueling infrastructure, including emissions regulations, tax incentives, grants, and subsidies. **2. Site Analysis** • **Location Selection:** Identification of potential sites based on proximity to SR-60, industrial hubs, and distribution centers. Factors like land availability, zoning, and access to utilities would be key considerations. • **Utility Infrastructure:** Evaluation of the existing electric grid or hydrogen supply infrastructure, and what upgrades might be necessary to support the depot. This includes power capacity and/or potential for renewable energy integration.
C-1b	Funding	Identify and secure funding for the planning and development of the medium- and heavy-duty (MDHD) ZEV refueling depot through State funding sources such as: 1. California's Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) program which has the goal of building more than 60 hydrogen fueling stations for Class 6-8 fuel cell electric vehicles (FCEV). 2. The California Energy Commission's (CEC) Clean Transportation Program and CALSTART's Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles which includes $1.02B in funding for zero-emission truck and bus infrastructure to be distributed between 2023 and 2027 (Class 2b-8). 3. California Air Resources Board's (CARB) Low Carbon Fuel Standard which provides infrastructure credits based on unused fueling capacity to fund the initial build-out of ZEV refueling infrastructure when fuel demand is low in early years.

Cornerstone		
Measure/ Action Number	**Pillar**	**Action**
C-1c	Partnership	Establish a project-specific partnership with local and/or regional agencies such as Southern California Association of Governments (SCAG), South Coast Air Quality Management District (AQMD), Riverside County Transportation Commission (RCTC), and/or Western Riverside Council of Governments' (WRCOG) Western Riverside County Clean Cities Coalition to pursue State and federal funding. Additionally, establish partnerships with utility providers (i.e., Moreno Valley Electric Utility and Southern California Edison) as part of the feasibility study to evaluate existing energy infrastructure at the site and facilitate effective planning and deployment of the refueling depot.
C-1d	Partnership	Identify potential private-sector project sponsors, such as the Ports of Los Angeles and Long Beach, warehouse owners and operators, utilities, truck stops and fuel station owners, private charging station networks, and ZEV truck manufacturers (that have expressed intent to invest in ZEV infrastructure), to understand future demand of ZEV infrastructure, pursue financing opportunities, and facilitate development/ implementation.
C-1e	Equity	Develop an outreach and engagement program with community-based organizations (CBO) to address concerns around the proposed development, collect feedback, and educate residents/stakeholders on the effects additional refueling infrastructure has on advancing MDHD ZEV adoption and therefore public health benefits.
C-1f	Engagement	Work with local fleet operators, vehicle operators, and fleet maintenance staff to support the development of a comprehensive training program, including hosting workforce development trainings to discuss the benefits and technical requirements of ZEV fleets and supporting infrastructure. Work with Moreno Valley College and Business and Employment Resource Center to develop, advertise, and promote workforce training programs to attract additional workforce support such as ZEV charging and fueling infrastructure technicians.
C-1g	Structural Change	Adopt a zoning ordinance to enforce Assembly Bill (AB) 1236 (2015), AB 970 (2021), and Senate Bill (SB) 1418 (2024)'s requirements for an expedited, streamlined permitting process for ZEV refueling stations (i.e., electric vehicle (EV) charging and hydrogen-fueling stations). Refer to the recommendations in the California Governor's Office of Business and Economic Development's EV Charging Station Permitting Guidebook[31] or the Hydrogen Station Permitting Guidebook,[32] where necessary. Steps include: 1. **Establish ZEV Refueling Zones:** Designate suitable geographic areas near the SR-60 corridor suitable as ZEV Refueling development. 2. **Environmental Impact Assessment (EIA):** Analyze the environmental implications of constructing and operating the depot, including emissions, land use, noise, and potential hazards. 3. **Develop ZEV Refueling Zoning Guidelines:** Establish guidelines for permissible uses and restrictions that balance ZEV refueling activity with the environment. The guidelines shall be carefully designed to mitigate factors like noise, traffic flow, and pollution levels.

31. *California Governor's Office of Business and Economic Development. Electric Vehicle Charging Station Permitting Guidebook (2023). Accessed at:* ***https://business.ca.gov/wp-content/uploads/2019/12/GoBIZ-EVCharging-Guidebook.pdf***
32. *California Governor's Office of Business and Economic Development. Hydrogen Station Permitting Guidebook (2020). Accessed at:* ***https://business.ca.gov/wp-content/uploads/2019/12/GO-Biz_Hydrogen-Station-Permitting-Guidebook_Sept-2020.pdf***

Cornerstone		
Measure/ Action Number	**Pillar**	**Action**
GHG Reduction Potential		**2030:** Supportive **2045:** Supportive
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community and Business Resilience

Building Energy Sector

Moreno Valley's Building Energy sector focuses on increasing the use of renewable and carbon-free electricity, advancing building electrification and energy efficiency, and supporting opportunities for local renewable energy generation and storage. As a City that owns and operates its own electric utility, Moreno Valley has a unique opportunity to reduce GHG emissions from electricity. Moreno Valley Electric Utility (MVU) serves over 8,900 customers and provides almost a third of the community's electricity needs.[33] Increasing the share of electricity sourced from renewable and carbon-free sources will directly reduce electricity emissions for these MVU customers. Measures BE-1 and BE-6 thus focus on increasing MVU's procurement and offset of renewable and carbon-free electricity and increasing the local generation and storage of renewable energy. As the remaining Moreno Valley community members are served by Southern California Edison (SCE), Measures BE-1 and BE-6 also focus on partnerships with SCE to encourage customers to opt-up to their 100 percent renewable energy option (i.e., Green Rate 100% Option) and install local renewable energy generation and storage.

The community can leverage this increased renewable and carbon-free electricity through building electrification. When paired with low- or zero-emission electricity, electrifying buildings lowers or eliminates the operational footprint of buildings. A key aspect of these efforts is ensuring that building electrification remains cost-effective for property owners and tenants. Studies have shown that switching from natural gas appliances to efficient electric alternatives—such as heat pumps for space heating and cooling, induction cooktops, and heat pump water heaters—can lower long-term operating and maintenance costs. For example, homeowners who replace aging gas furnaces with electric heat pumps often achieve lower monthly energy bills due to improved efficiency and reduced maintenance.[34] Similarly, businesses can stabilize operating costs by pairing electric equipment with onsite solar and battery storage systems, which can reduce peak demand charges and hedge against future utility rate increases.[35]

To achieve these goals, Measures BE-2 and BE-3 focus on decarbonizing new residential and nonresidential buildings in Moreno Valley. Decarbonization refers to the process of significantly reducing and working towards eliminating GHG emissions from activities, systems, or products. It typically involves transitioning away from high-carbon fuels, improving energy efficiency, and adopting low- or zero-emission technologies and practices. The goal is to lower overall carbon intensity, recognizing that complete elimination may not be immediately feasible but striving for reductions over time. All-electric new buildings are one such pathway to decarbonize new buildings in Moreno Valley. Measures BE-4 and BE-5 focus on decarbonizing existing residential and nonresidential buildings in Moreno Valley. Implementing building code updates, streamlining permitting processes, and focusing on decarbonization retrofits paired with energy efficiency improvements will help decarbonize new and existing buildings in Moreno Valley. Feasibility studies will identify the most cost-effective strategies for local conditions, while ongoing engagement and clear guidance to community members will help Moreno Valley property owners and tenants realize the financial advantages of electrification. Altogether, these building decarbonization efforts will reduce

33. *MVU customer data is based on data from 2025. MVU's share of the community's electricity supply is based on MVU and SCE data from the 2019 community GHG emissions inventory.*

34. *Rocky Mountain Institute (2018). The Economics of Electrifying Buildings. Accessed December 2024 at:* ***https://rmi.org/insight/the-economics-of-electrifying-buildings/***

35. *California Energy Commission (2021). Integrated Energy Policy Report. Accessed December 2024 at:* ***https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2021-integrated-energy-policy-report***

natural gas consumption from new and existing buildings and help create a sustainable and resilient energy system for the Moreno Valley community.

Table 3-3. Building Energy Measures and Actions Table

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
Measure BE-1	**Procure or offset 70% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.[36]**	
BE-1a	Feasibility Study	Conduct comprehensive electrification infrastructure and capacity studies to assess the long-term viability of transitioning Moreno Valley Electric Utility (MVU) to 100% renewable energy by 2045. This study shall include the following steps: 1. Develop a community-wide electric energy and demand forecast that estimates future electricity usage and peak demands driven by the adoption rates of building electrification, electric vehicles, and other renewable energy technologies. This forecast will guide the planning of necessary infrastructure upgrades and inform the scale of new renewable energy sources required. 2. Review and assess long-term energy contracts to identify opportunities for replacing non-renewable sources with renewable power or Renewable Energy Credits (RECs). This analysis shall consider the potential impacts on achieving the renewable energy goals and include recommendations for contract renegotiations or terminations that align with the 2030 and 2045 targets. 3. Using the developed energy and demand forecast, create an Integrated Resource Plan (IRP) to meet Moreno Valley's future energy needs and renewable energy targets through 2045. This plan shall explore various generation resources, such as local and remote renewable generation sites, energy storage solutions, microgrids, RECs and the development of virtual power plants. 4. Formalize a long-term electric capital improvement plan, focusing on the infrastructure improvements necessary to meet the anticipated increase in renewable energy generation and distribution. The plan shall prioritize infrastructure upgrades and projects that support the renewable energy transition, evaluating potential barriers, funding sources, and impacts on electricity rates.
BE-1b	Feasibility Study	Develop a plan to convert all customers within the Moreno Valley City Limits to MVU. The plan shall prioritize customers that are lowest cost to acquire and establish phased targets for this conversion (e.g., share of annual revenue spent on converting Southern California Edison (SCE) customers to MVU).

36. *In 2022, the City of Moreno valley procured 33.4% eligible renewable electricity and is required to increase this to 60% procurement by 2030 in accordance with SB 100 (2018) and SB 1020 (2022) requirements. Accessed at:* ***https://moreno-valley.ca.us/mvu/pdfs/power-content2022.pdf***.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-1c	Structural Change	Develop and adopt a resolution to adopt Action BE-1a's IRP that will allow MVU to exceed the requirements of Senate Bill (SB) 100 (2018) and SB 1020 (2022) by 2030 where 70% of the electricity mix is sourced from a combination of eligible renewable sources, carbon-free sources, and/or offset by RECs. As part of this resolution include actions to: 1. Establish valuation rankings for various generation types and projects. 2. Address the reliability and cost benefits of energy storage and/or demand response by 2030. 3. Indicate what percent geothermal and other low-carbon eligible renewables will continue to make up in the overall electricity mix. The resolution shall exceed State renewable energy mandates, making sure that the City's legal framework supports a seamless transition to renewable energy.
BE-1d	Engagement	Work with MVU and SCE to develop a multi-faceted public engagement strategy to educate the community about the importance of transitioning to renewable energy. Include a variety of communication channels, such as social media, local media outlets, workshops, town hall meetings, and school programs. Highlight the environmental and economic benefits of renewable energy, the City's goals, and how residents and businesses can participate. Additionally, work with SCE to encourage customers to opt-up to SCE's Green Rate 100% Option.
BE-1e	Equity	Continue implementing MVU programs to provide equitable access to renewable energy for income-qualified families and those who require medical life-support devices (through the Energy Bill Assistance,[37] Medical Baseline Plan,[38] and Utility Tax Exemption programs[39]), in line with the City of Moreno Valley 2021-2029 Housing Element (Housing Element) Program 6-A. Regularly review the programs to assess their effectiveness in reducing energy bill burdens amongst MVU customers.
BE-1f	Funding	Facilitate MVU customers in utilizing GREEN MoVal[40] incentive and technical assistance programs targeting energy efficiency and solar installations, if applicable. Similarly, encourage SCE customers to utilize energy finance programs such as Western Riverside Council of Governments' (WRCOG) Property Assessed Clean Energy (PACE) program,[41] in line with the Housing Element Program 6-A. These funds can be used to support energy efficiency upgrades, rooftop solar installations, and other renewable energy improvements for homes and businesses. Conduct targeted outreach to public entities, such as public schools, which are eligible for the California Energy Commission (CEC) Energy Conservation Assistance Act (ECAA) Program loans,[42] which provide funding for energy efficiency and renewable energy projects.

37. *City of Moreno Valley. Payment Programs. Energy Bill Assistance. Accessed at:* **https://www.moval.org/mvu/payment-progs.html#tab-2**
38. *City of Moreno Valley. Payment Programs. Medical Baseline Plan. Accessed at:* **https://www.moval.org/mvu/payment-progs.html#tab-3**
39. *City of Moreno Valley. Payment Programs. Utility Tax Exemption. Accessed at:* **https://www.moval.org/mvu/payment-progs.html#tab-4**
40. *GREEN MoVal (Getting Really Energy Efficient Now) is a City of Moreno Valley program that offers rebates and incentives for energy-efficient upgrades, solar installations, and electric vehicles to help residents save money and reduce environmental impacts. Accessed at:* **https://moval.gov/green/index.html**
41. *Western Riverside Council of Governments (WRCOG). WRCOG PACE Programs. Accessed at:* **https://wrcog.us/230/PACE**
42. *California Energy Commission (CEC). Energy Conserrvation Assistance Act. Accessed at:* **https://www.energy.ca.gov/programs-and-topics/programs/energy-conservation-assistance-act**

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-1g	Partnership	Form strategic alliances with regional renewable energy providers, academic institutions, nonprofit organizations, and other municipalities to support the implementation of the renewable energy targets.
GHG Reduction Potential		**2030:** 13,399 MT CO_2e **2045:** 0 MT CO_2e[43]
Co-benefits		• Cleaner Air and Healthier Communities
Measure BE-2	**Decarbonize new residential construction by at least 95% by 2026.**	
BE-2a	Feasibility Study Equity	Carry out a detailed study to identify the challenges and costs associated with decarbonizing new residential developments. The study shall include: 1. A comprehensive decarbonization plan for new residential buildings, with a focus on assessing the financial implications of electrification. 2. Evaluation of the potential impact of electrification on the cost and feasibility of multifamily and affordable housing projects, and develop strategies to mitigate negative impacts, promoting equitable access to sustainable housing.
BE-2b	Structural Change	Adopt a single margin source energy score[44] to decarbonize at least 95% of new residential construction by 2026.[45] As part of decarbonization legislation development, incorporate the following: 1. Educate affordable housing developers on the cost-effectiveness of all-electric buildings and the future impact of stranded assets to encourage all-electric construction. 2. Establish a robust permitting compliance program to enforce the ordinance by streamlining the compliance process, training enforcement staff, and including regular inspections and penalties for non-compliance. Include major residential renovations under the single margin source energy score by 2026.
BE-2c	Engagement	Lead targeted engagement efforts with residential developers to maximize the adoption of all-electric, energy-efficient designs in new housing projects. This engagement shall focus on hosting educational workshops for residential developers to provide them with the latest information on electrification, funding opportunities, and the benefits of constructing all-electric homes.

43. SB 100 (2018) 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_2e per kilowatt-hour (kWh), resulting in no additional reductions for Measure BE-1 beyond the State-mandated baseline.

44. A single margin source energy score ordinance is a local amendment to the building code that establishes a single metric to evaluate a building's energy efficiency or GHG emissions. The single metric is established for buildings of all energy types to set a consistent standard for new construction.

45. The City's goal is to avoid stranded assets by requiring new residential construction be designed for long-term sustainability through electrification. However, the City acknowledges that certain specific uses may require continued natural gas usage, and any such exceptions shall be evaluated on a case-by-case basis to align with broader decarbonization objectives.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-2d	Partnership	Partner with key stakeholders involved in residential construction to facilitate the transition to decarbonized new homes. Develop comprehensive training programs in collaboration with local contractors, realtors, and homeowner associations. These programs shall cover the technical requirements and benefits of residential building decarbonization, provide education on the City's permitting compliance program (Action BE-2b) and offer guidance on avoiding service upgrade requirements through accurate load calculations.
BE-2e	Funding	Promote the use of State and federal incentives specifically for residential developers, such as the California Energy Commission's (CEC) Building Initiative for Low-Emissions Development (BUILD),[46] the Affordable Housing and Sustainable Communities (AHSC) Program,[47] and the California Electric Homes Program (CalEHP).[48] Continue to offer incentives (Density Bonus Program) for residential housing units built to green building standards, in line with the City of Moreno Valley 2021-2029 Housing Element Program 6-B.
GHG Reduction Potential		**2030:** 19,522 MT CO_2e **2045:** 121,094 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-3	**Decarbonize new nonresidential construction by at least 95% by 2026.**	
BE-3a	Feasibility Study	Conduct a comprehensive feasibility study that assesses the practical and economic implications of decarbonizing new nonresidential buildings in Moreno Valley. This study shall: 1. Explore the economic impacts of decarbonization requirements on key sectors such as logistics, manufacturing, and retail, which are central to the Moreno Valley's economy. 2. Identify technological and operational challenges that businesses might face, offering solutions like incentives for early adoption of low-carbon technologies. 3. Investigate potential incentive structures to encourage businesses to exceed minimum requirements, such as tax breaks, expedited permitting, or grants for renewable energy systems. 4. Analyze the potential cost impacts on businesses, particularly small to medium-sized enterprises, and propose strategies to mitigate these impacts, promoting equitable decarbonization. 5. Include an analysis of the effectiveness of promoting and incentivizing solar installations, energy-efficient building operations systems, and the use of alternative-fueled equipment in achieving the Moreno Valley's decarbonization goals.

46. *California Energy Commission (CEC). Building Initiative for Low-Emissions Development Program - BUILD. Accessed at:* ***https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program-build***

47. *California Department of Housing and Community Development. Affordable Housing & Sustainable Communities (AHSC). Accessed at:* ***https://www.hcd.ca.gov/grants-and-funding/programs-active/affordable-housing-and-sustainable-communities***

48. *California Energy Commission (CEC). California ELectric Homes Program - CalEHP. Accessed at:* ***https://www.energy.ca.gov/programs-and-topics/programs/california-electric-homes-program-calehp***

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-3b	Structural Change	Adopt a single margin source energy score to decarbonize 95% of new nonresidential construction (i.e., commercial and industrial buildings including warehouses) by 2026.[49] As part of decarbonization legislation development, incorporate the following: 1. Require developers of new nonresidential projects to submit infeasibility waivers if full electrification is not currently possible (due to technology constraints), enforcing a rigorous review process to validate these exemptions. 2. Mandate that any new nonresidential building deemed infeasible for full electrification must exceed Title 24 energy efficiency standards and be prewired and prepared for future electrification. 3. Incorporate flexibility in compliance paths, allowing businesses to choose cost-effective decarbonization strategies, such as investing in energy-efficient technologies or participating in Moreno Valley Electric Utility's (MVU) or Southern California Edison's (SCE) renewable energy programs. 4. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 5. Require regular review of and updates (at least every three years) to the ordinance to keep pace with technological advancements and market trends, so it supports both sustainability goals and economic development. Include nonresidential major renovations under the single margin source energy score by 2026.
BE-3c	Equity	Regularly monitor the implementation of the single margin source energy score to assess if it disproportionately affects small businesses. Engage with these community members to identify strategies to address any disproportionate effects identified and help them gain access to available electrification funding (identified in Action BE-3d) and MVU's GREEN MoVal programs. This shall include offering lower-interest financing options or rebates for businesses that might otherwise struggle to afford the upfront costs of electrification.

49. The City's goal is to avoid stranded assets by ensuring new nonresidential construction is designed for long-term sustainability through electrification. However, the City acknowledges that certain specific uses may require continued natural gas usage, and any such exceptions will be evaluated on a case-by-case basis to align with broader decarbonization objectives.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-3d	Funding	Identify and pursue funding opportunities to help developers and property owners offset the costs of decarbonizing new nonresidential buildings. Potential funding sources include: 1. Apply for grants through programs like the California Energy Commission's (CEC) Electric Program Investment Charge (EPIC) program,[50] the Inflation Reduction Act,[51] and the Infrastructure Investment and Jobs Act[52] to support large-scale decarbonization projects. 2. Create a local fund to provide low-interest loans, rebates, or grants to businesses that invest in high-performance, low-carbon building technologies. 3. Encourage public-private partnerships that allow businesses to share the costs of decarbonization with government or non-governmental entities, such as through joint investments in renewable energy infrastructure with MVU or SCE and cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of clean fuels and technologies that lower or eliminate emissions. 4. Investigate the use of innovative financing models, such as Property Assessed Clean Energy (PACE) financing, to help businesses spread the costs of decarbonization over time. PACE programs allow a property owner to finance the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than to an individual.
BE-3e	Engagement	Lead targeted engagement efforts with commercial developers and business stakeholders to promote the benefits of electrification and decarbonization. This shall include showcasing available incentives from the CEC and other programs, such as the Self-Generation Incentive Program (SGIP)[53] and federal tax credits. Regularly collaborate with business associations and chambers of commerce to educate developers and property owners on the long-term economic benefits of building decarbonization, aligning these efforts with Moreno Valley's economic development goals.
BE-3f	Partnership	Collaborate with local and regional stakeholders, including business associations, MVU, SCE, South Coast AQMD, and technology firms, to facilitate the decarbonization of nonresidential buildings and connect developers with funding (identified in Action BE-3d) for all-electric new nonresidential construction. Additionally, collaborate with local economic development agencies to align decarbonization efforts with broader business attraction and retention strategies and to position Moreno Valley as a leader in sustainable business practices.
GHG Reduction Potential		**2030:** 5,106 MT CO_2e **2045:** 32,231 MT CO_2e

50. *California Energy Commission (CEC). Building Initiative for Low-Emissions Development Program - BUILD. Accessed at:* ***https://www.energy.ca.gov/programs-and-topics/programs/building-initiative-low-emissions-development-program-build***
51. *United States Environmental Protection Agency (EPA). Climate Pollution Reduction Grants. Accessed at:* ***https://www.epa.gov/inflation-reduction-act/climate-pollution-reduction-grants***
52. *U.S. Department of Transportation. Infrastructure Investment and Jobs Act Grant Program. Accessed at:* ***https://www.transportation.gov/infrastructure-investment-and-jobs-act/infrastructure-investment-and-jobs-act-grant-programs***
53. *California Public Utilities Commission. Self-Generation Incentive Program (SGIP). Accessed at:* ***https://www.cpuc.ca.gov/sgip***

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-4	**Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% by 2030 and 31% by 2045.**	
BE-4a	Feasibility Study	Assess the feasibility and cost implications of retrofitting existing residential buildings for electrification. This study shall: 1. Determine the hurdles that residents living on low incomes may face with household electrification. Develop cost-saving strategies and potential funding solutions to address equity hurdles. 2. Assess the existing housing stock in Moreno Valley and the potential need for electrical panel upgrades due to electrification, including the need when paired with smart panels.[54] 3. Outline the necessary funding and financing mechanisms to support the community in achieving the decarbonization goals.
BE-4b	Structural Change	Develop and adopt a reach code[55] requiring all new residential central air conditioning unit installations and replacements be two-way, providing both heating and cooling with a single unit for residential buildings by 2026. Include the following aspects in the code development: 1. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 2. Monitor the effectiveness of the reach code through the permitting compliance program and revise the reach code during each update cycle as needed to meet the decarbonization goal.
BE-4c	Structural Change	Continue providing GREEN MoVal programs to Moreno Valley Electric Utility (MVU) customers and technical assistance for residential building retrofits. Expand the programs to focus incentives and technical assistance on panel upgrades,[56] heat pump water heater replacements, and heat pump heating, ventilation, and air conditioning (HVAC)[57] installations to support existing residential building electrification.

54. *A smart panel refers to an advanced electrical panel that monitors and controls a home's electricity. It can be used to help lower electricity bills and optimize energy usage by prioritizing certain loads, monitoring electricity usage in real-time with alerts, and connecting to solar panels and battery storage.*
55. *A reach code is a local or regional building code that goes beyond minimum Statewide or national energy efficiency requirements. Reach codes set higher standards to drive increased energy efficiency, reduce carbon emissions, and promote sustainable building practices.*
56. *A panel upgrade refers to replacing an existing electrical panel with a larger one that has more circuit slots, providing capacity for additional electrical load in the building.*
57. *A heat pump heating, ventilation, and air conditioning (HVAC) system is an all-electric HVAC system that transfers heat rather than generating it directly, and provides both heating and cooling for a building.*

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-4d	Structural Change	Streamline permitting processes for the installation of smart panels and other technologies that support electrical demand management in residential buildings to enforce Senate Bill (SB) 379 (2022)'s requirements. This action shall: 1. Simplify the permitting requirements for smart panels and demand management technologies to accelerate adoption in residential properties in alignment with SB 379 (2022)'s requirements. This shall include an online, automated permitting platform, easy-to-understand compliance checklists, and expedited permitting for these technologies. 2. Evaluate the opportunity to waive permit fees for projects that include smart panels and similar technologies that contribute to efficient electrical demand management and energy savings. 3. Collaborate with relevant City departments to implement the updated permitting procedures effectively and review them regularly to accommodate emerging demand management technologies. 4. Promote the streamlined process to homeowners and contractors, emphasizing the benefits of smart panels for managing electricity costs during electrification efforts.
BE-4e	Partnership	Collaborate with local unions, industrial groups, and Moreno Valley College to create training programs focused on the installation and retrofit of electric appliances in residential buildings. This program shall: 1. Help develop training or apprenticeships that prepare the local workforce for green jobs in electrification. 2. Work closely with industry partners to align training with current and future market demands.
BE-4f	Partnership	Continue engagement with Southern California Edison (SCE) to help it implement residential efficiency and electrification programs (modeled after MVU's GREEN MoVal programs including the Residential Energy Audit & Direct Install Program[58]) for customers in Moreno Valley.
BE-4g	Engagement	Continue to educate MVU residents on MVU's GREEN MoVal programs to support and fund existing building electrification; and SCE residents on SCE's Charge Ready Home program for electrical panel upgrades. Additionally, work with SCE to encourage enrollment in SCE's Demand Response programs[59] for to help residents mitigate electricity bill cost increases from electrification.
BE-4h	Funding	Identify and secure funding through various sources, including California Air Resources Board (CARB), the Inflation Reduction Act, and the Infrastructure Investment and Jobs Act to fund MVU's GREEN MoVal program expansion and provide residents with existing building electrification incentives. Additional funding options may include U.S. Department of Energy (DOE) block grants, community development block grants, green bonds, grant anticipation notes or short-term loans, tax-exempt lease purchases, energy as a service, and energy performance contracting from energy service companies.

58. *City of Moreno Valley. GREEN MoVal. Accessed at:* ***https://moval.gov/green/index.html***

59. *Southern California Edison. What is Demand Response? Accessed at:* ***https://www.sce.com/save-money/savings-programs/ways-to-save-at-home/what-is-demand-response***

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-4i	Equity	Collaborate with affordable housing owners, utilities, and community organizations to fund and implement a pilot project aimed at electrifying existing low-income housing. Work with MVU to develop a program that offsets the cost of electrification through on-bill financing and by sourcing grant funds. Engage with community groups to address the specific needs of residents living on low incomes in the pilot project.
GHG Reduction Potential		**2030:** 11,305 MT CO_2e **2045:** 134,341 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure BE-5	**Decarbonize existing nonresidential buildings to reduce existing nonresidential natural gas consumption by 3.8% by 2030 and 18% by 2045.**	
BE-5a	Feasibility Study	Initiate a comprehensive feasibility study to identify barriers to electrifying existing nonresidential buildings across various industries in Moreno Valley. This study should include an analysis of the cost range for retrofitting different types of nonresidential buildings, considering the unique challenges faced by warehouses, manufacturing facilities, and other large-scale operations prevalent in Moreno Valley. The study shall also assess the appropriate project threshold for requiring electric upgrades to achieve the goal of decarbonizing 3.8% of existing nonresidential buildings by 2030.
BE-5b	Structural Change	Develop and adopt a reach code requiring all new nonresidential central air conditioning unit installations and replacements be two-way, providing both heating and cooling with a single unit for nonresidential buildings by 2026. Include the following aspects in the code development: 1. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 2. Monitor the effectiveness of the reach code through the permitting compliance program and revise the reach code during each update cycle as needed to meet the decarbonization goal.
BE-5c	Structural Change	Continue providing GREEN MoVal programs to Moreno Valley Electric Utility (MVU) customers to provide funding and technical assistance for nonresidential building retrofits. Expand the programs to focus incentives and technical assistance on panel upgrades, heat pump water heater replacements, and heat pump HVAC installations to support existing nonresidential building electrification. Additionally, scale up the programs' incentives to cover a larger portion of nonresidential building retrofit costs.
BE-5d	Funding	Facilitate access to funding and incentives for nonresidential building owners aiming to electrify and businesses aiming to decarbonize their operations. This includes pursuing the funding options identified in Action BE-4h.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-5e	Engagement	Launch an outreach campaign to promote existing nonresidential building decarbonization. This campaign shall include: 1. Targeted outreach to businesses, contractors, property managers, and building owners highlighting the benefits of, available funding for, and available technical assistance for existing nonresidential building electrification. Tailor the information specifically for the commercial and industrial sectors in Moreno Valley including warehouses. Outreach shall include workshops/webinars and informational brochures including MVU bill inserts. 2. Promoting MVU's Energy Load Program to help customers manage their energy profile to reduce electricity bill cost increases with electrification. 3. Encouraging enrollment in Southern California Edison (SCE)'s Demand Response programs for businesses as well as the installation and use of smart panels and building management systems to manage electricity costs during electrification. 4. Maintaining an updated webpage on the City's website to promote the above information and available energy benchmarking tools like the ENERGY STAR Portfolio Manager[60] to help nonresidential building owners (>50,000 square feet) comply with the California Energy Commission's Building Energy Benchmarking Program.[61] 5. Highlighting opportunities for nonresidential carbon capture technology retrofits, showcasing potential co-benefits.
BE-5f	Equity	Regularly monitor the implementation of the two-way air conditioning reach code (Action BE-5b) to assess if it disproportionately affects small businesses and low-income nonresidential property owners. Engage with these community members to identify strategies to address any disproportionate effects identified and help them gain access to available electrification funding (identified in Action BE-4h) and MVU's GREEN MoVal programs. This shall include offering lower-interest financing options or rebates for businesses that might otherwise struggle to afford the upfront costs of electrification.
BE-5g	Partnership	Collaborate with regional business associations, local chambers of commerce, and industrial leaders to establish a coalition focused on decarbonizing nonresidential buildings. This coalition shall work closely with MVU and partner with SCE to help tailor energy solutions (in MVU's GREEN MoVal programs) and education campaigns (Action BE-5e's education campaign) that meet the specific needs of different industries within Moreno Valley. The coalition shall also support the City's efforts to pursue funding for existing nonresidential building electrification (including those in Action BE-4h).
GHG Reduction Potential		**2030:** 1,645 MT CO_2e **2045:** 24,124 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities

60. *ENERGY STAR Portfolio Manager footnote: ENERGY STAR Portfolio Manager. Accessed at:* ***https://portfoliomanager.energystar.gov/pm/login?testEnv=false***.

61. *Building Energy Benchmarking Program footnote: California Energy Commission. Building Energy Benchmarking Program. Accessed at:* ***https://www.energy.ca.gov/programs-and-topics/programs/building-energy-benchmarking-program***.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
Measure BE-6	**Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.**	
BE-6a	Structural Change	Streamline permitting processes for solar installations to accelerate the deployment of renewable energy generation and storage systems in residential buildings to enforce Senate Bill (SB) 379 (2022)'s requirements. This action shall: 1. Simplify the permitting requirements for solar and energy storage installations to accelerate adoption in residential properties in alignment with SB 379 (2022)'s requirements. This shall include an online, automated permitting platform, easy-to-understand compliance checklists, and expediated permitting for these technologies. 2. Evaluate the opportunity to waive permit fees for the installations that permit requirements. 3. Coordinate with relevant City departments to implement the updated permitting procedures effectively and review them regularly to accommodate emerging solar and storage technologies. 4. Promote this streamlined process through outreach to businesses and property owners to increase awareness and participation.
BE-6b	Feasibility Study	Conduct a feasibility study by 2027 to identify factors including capacity needs, costs, site suitability, and technology options for Moreno Valley Electric Utility (MVU) to install utility-scale energy storage infrastructure to support Measure BE-1's renewable energy goals. Based on the feasibility study's results, develop a plan to implement the utility-scale renewable energy storage projects.
BE-6c	Feasibility Study	Evaluate the adoption of an ordinance requiring a certain percentage of roof area on new and majorly renovated nonresidential buildings be dedicated to solar photovoltaic (PV) systems paired with energy storage. The ordinance shall: 1. Establish a mandatory solar coverage percentage (e.g., at least 50% of usable roof space) for qualifying buildings, with flexibility for property owners to either install the systems themselves or lease the space to MVU or Southern California Edison (SCE) for renewable energy production. 2. Require the inclusion of battery storage systems alongside PV installations, to enhance energy resilience and support grid stability. 3. Provide incentives such as expedited permitting or fee reduction for projects that exceed the minimum solar and storage requirements or integrate innovative renewable energy solutions like microgrids.

Building Energy		
Measure/ Action Number	**Pillar**	**Action**
BE-6d	Engagement	Partner with MVU and SCE to develop an education campaign to inform residential property owners and perform targeted outreach to large nonresidential property owners about the benefits of and available incentives for local renewable energy generation and storage. This campaign shall: 1. Provide detailed information on available incentives, rebates, and tax credits for installing solar PV and battery storage systems on homes and businesses, including the Self-Generation Incentive Program (SGIP),[62] Solar on Multifamily Affordable Housing (SOMAH),[63] and federal tax credits. 2. Highlight case studies and testimonials from businesses that have successfully implemented solar and storage solutions, including those that have used onsite solar installation as a way to comply with South Coast Air Quality Management District (AQMD)'s Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program.[64] 3. Create educational materials and host workshops on topics such as energy resilience, microgrids, and the financial benefits of renewable energy. 4. Organize events that connect nonresidential property owners with solar developers, financial institutions, and MVU representatives to explore partnership opportunities.
BE-6e	Partnership	Through Action BE-5g's coalition, support the development and implementation of renewable energy and storage projects. Key activities include: 1. Collaborating with local unions and educational institutions to provide training programs focused on the installation and maintenance of commercial solar and storage systems. 2. Exploring opportunities for shared renewable energy projects, such as community solar and energy storage or microgrids, that can be implemented on or near large commercial and industrial properties. Review opportunities to lease roof space for solar PV installations or the solar PVs to MVU. 3. Investigating opportunities for co-located energy generation facilities, where excess heat or power from industrial processes could be harnessed for additional renewable energy production.
BE-6f	Funding	Pursue State and federal funding (such as the U.S. Department of Energy's Long-Duration Energy Storage (LDES) Pilot Program[65] or the State's California Climate Investments for LDES in disadvantaged communities[66]) to implement Action BE-6b's utility-scale energy storage plan for MVU. Additionally, explore the issuance of green bonds or other financing mechanisms to fund MVU's utility-scale solar and storage projects. Pursue opportunities to partner with financial institutions that offer favorable terms for sustainable energy projects.

62. California Public Utilities Commission (CPUC). Self-Generation Incentive Program (SGIP). Accessed at: **https://www.cpuc.ca.gov/sgip**

63. CPUC. The Solar on Multifamily Affordable Housing (SOMAH) Program. Accessed at: **https://www.cpuc.ca.gov/somah/**

64. South Coast Air Quality Management District. WAIRE Program. Accessed at: **https://www.aqmd.gov/home/rules-compliance/compliance/waire-program**

65. U.S. Department of Energy. Long-Duration Energy Storage Pilot Program Notifications. Accessed at: **https://www.energy.gov/oced/long-duration-energy-storage-pilot-program-notifications**

66. California Energy Commission. Long Duration Energy Storage Program. Accessed at: **https://www.energy.ca.gov/programs-and-topics/programs/long-duration-energy-storage-program**

Building Energy		
Measure/ Action Number	Pillar	Action
BE-6g	Equity	Include direct outreach to building owners of residents living on low incomes and small businesses in Action BE-6d's education campaign to connect them with available incentives for renewable energy generation and storage.
GHG Reduction Potential		**2030:** Supportive **2045:** Supportive
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community and Business Resilience

Transportation Sector

Moreno Valley's Transportation sector aims to first reduce VMT then shift the remaining VMT to ZEVs to further reduce GHG emissions. VMT is a measure of the total miles driven by all vehicles within a specified region and timeframe, often used to gauge traffic levels and evaluate transportation policies. By promoting active transportation, improving public transit and increasing access to public transit through multi-modal transportation, and encouraging telecommuting, the Transportation sector aims to reduce VMT. The sector then aims to increase ZEV adoption to electrify or decarbonize the remaining VMT as well as offroad vehicle and equipment use to further reduce GHG emissions. This multifaceted strategy recognizes the importance of vehicle electrification and decarbonization to reduce GHG emissions while acknowledging the additional benefits of VMT reduction including decreased congestion, improved local commerce, and better community health.

Reducing Vehicle Miles Traveled

Providing sustainable and affordable mobility options without requiring significant lifestyle changes is central to Moreno Valley's approach to curbing VMT. Measure T-1 aims to increase the share of trips made through active transportation mode shares, including biking and walking, by improving Moreno Valley's bicycle and pedestrian infrastructure. Priorities include, updating and implementing the Moreno Valley Bicycle Master Plan, expanding the network of active transportation corridors,[67] enhancing "Safe Routes"[68] connections to schools and employment hubs, and offering resources to educate residents about the benefits of walking and cycling.

Measure T-2 centers around working with the Riverside Transit Agency (RTA) to improve public transit access and infrastructure in Moreno Valley. RTA provides bus and other public transit services to western Riverside County. Moreno Valley plans to continue this partnership to expand and refine bus routes and increase multi-modal transportation options to improve community members' access to regional public transit services. Multi-modal transportation options refer to all modes of transportation including cars, bicycles, walking, buses, rail, and micromobility like e-bikes, and scooters. A fully multi-modal transportation system allows people easy access to public transit and the ability to transition between transportation modes. These improvements will help increase access to RTA's buses and the Moreno Valley/March Field Metrolink Station. Microtransit options, or flexible forms of shared transportation operating on-demand or along dynamic routes, will also be specifically employed to improve first- and last-mile access to the Moreno Valley/March Field Metrolink Station. Altogether, these improvements will help increase public transit use and the community's overall mobility.

Measure T-3 aims to reduce VMT by encouraging and increasing access to work-from-home opportunities. The measure focuses on expanding broadband internet service infrastructure, collaborating with local employers to promote telecommuting policies, and educating the community on remote work's financial, environmental, and lifestyle benefits. These efforts will not only help reduce VMT and GHG emissions but also reduce peak traffic congestion and support flexibly workplace environments.

67. Active transportation corridors can include lanes that are reserved for active transportation modes and neighborhood shortcuts that connect streets to parks, schools, and other streets, shortening trips for people traveling by active transportation modes.

68. "Safe Routes" refers to the Safe Routes to School program, a national and statewide initiative that aims to improve safety and accessibility for children walking and biking to school. The program supports infrastructure improvements, education, and community engagement to encourage active transportation and reduce traffic-related injuries near schools. See Action T-1a(3) for more information on how this program will be implemented.

Transportation Decarbonization

After reducing VMT, Measure T-4 will address the remaining GHG emissions from VMT by electrifying or decarbonizing vehicles through ZEV adoption. ZEVs are vehicles that produce no direct or tailpipe GHG emissions. These vehicles include electric vehicles (EVs) and hydrogen fuel cell vehicles. Measure T-4 focuses on putting the right infrastructure and incentives in place so that the adoption of ZEVs becomes a sound, voluntary choice for community members. From increasing the number of publicly accessible EV charging stations through public-private partnerships and launching a public outreach campaign to promote available EV rebates, Moreno Valley's transportation strategies rely on encouraging market-based decisions rather than imposing top-down requirements on community members. This measure works in conjunction with the Cornerstone measure, Measure C-1, to make ZEVs an easy decision for both passenger and commercial vehicles in Moreno Valley.

Lastly, Measure T-5 aims to decarbonize off-road equipment and vehicles by supporting CARB's and South Coast Air Quality Management District's (AQMD) programs. CARB has begun to regulate the sale of gasoline- and diesel-powered small off-road engines—the engines used in most lawn and garden equipment—while South Coast AQMD has established the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program to regulate GHG emissions from warehouses, including emissions from their on-site off-road equipment and vehicles. Focusing on off-road equipment and vehicle decarbonization will not only help Moreno Valley community members and businesses comply with these State and regional regulations but also reduce communitywide GHG emissions, local air pollutants, and noise. Through phased ordinances, partnerships, and targeted outreach, local off-road fleets will transition to electric alternatives or utilize renewable diesel to decarbonize.

Table 3-4. Transportation Measures and Actions Table

Transportation		
Measure/ Action Number	**Pillar**	**Action**
Measure T-1	**Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.**	
T-1a	Feasibility Study	Conduct a comprehensive update of Moreno Valley's Bicycle Master Plan to assess and address current quality and connectivity conditions and gaps in the active transportation network, in line with Circulation Element Goal C-1, which emphasizes providing a well-connected, multimodal transportation system. The update shall: 1. Identify new areas and existing roadways to convert high stress streets to low stress bikeways with the goal of doubling Moreno Valley's Bicycle Network Analysis (BNA)[69] score (or similar bicycle network scoring criteria) by 2030. The identification shall include converting at least 20 miles of high stress streets to safe bikeways by 2030. 2. Prioritize projects such as the proposed bike lane extensions along Perris Boulevard and the creation of people-only pathways linking residential areas with key destinations like the Moreno Valley Mall, schools, and parks. 3. Prioritize "Safe Routes" initiatives, focusing on enhancing pedestrian and bicycle access to schools and employment centers. This shall include improvements to intersections, crosswalks, and signage around schools and major employment hubs, creating safer routes for students and workers. 4. Evaluate existing bicycle parking and recommend a policy or ordinance to require or encourage the installation of visible bicycle parking infrastructure in certain types of new construction.
T-1b	Structural Change	Update and implement the Bicycle Master Plan to double Moreno Valley's BNA score (or similar bicycle network scoring criteria) and convert at least 20 miles of high stress streets to safe bikeways throughout Moreno Valley by 2030 and implement City policies that align with Moreno Valley's 2040 General Plan Circulation Element to provide a safe and well-connected multi-modal system. This implementation shall include the development of Complete Streets, emphasized in Policy C.2-1, promoting the design of streets that are safe for all users, including pedestrians, bicyclists, and public transit riders.

69. *Bicycle Network Analysis People for Bikes. Moreno Valley, CA, US. Accessed at:* ***https://bna.peopleforbikes.org/#/places/161f90bb-3d30-44b8-953b-ca9a30c4ad95/***

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-1c	Funding Partnership	Pursue the following partnerships and fees to fund the implementation of the updated Bicycle Master Plan's active transportation projects: 1. Collaborate with Riverside County Transportation Commission (RCTC), Western Riverside Council of Governments (WRCOG), Caltrans, and other relevant agencies to identify and secure funding to implement the updated Bicycle Master Plan's active transportation projects. Pursue grants such as the Active Transportation Program,[70] Sustainable Transportation Equity Project (STEP),[71] and Caltrans Sustainable Transportation Planning Grants.[72] 2. Engage local businesses and developers to create Business Improvement Districts to drive investment in active transportation infrastructure, such as the construction of bike lanes or pedestrian-friendly zones in commercial areas. 3. Leverage Development Impact Fees (DIFs) as outlined in Policy C3-6 of the Circulation Element to fund transportation improvements that enhance connectivity between residential neighborhoods and employment centers, such as the proposed enhancements along major corridors like Alessandro Boulevard and Moreno Beach Drive.
T-1d	Partnership	Partner with Moreno Valley Unified School District, Val Verde Unified School District, and Moreno Valley College to promote active transportation. Conduct events like "Bike to School" or "Walk to Work" days, supported by the Circulation Element's Goal C-4, which advocates for increasing non-motorized transportation modes. Engage these institutions in implementing safety measures, such as enhanced crosswalks and bike racks, particularly at schools and college campuses.
T-1e	Partnership	Work with Caltrans to incorporate active transportation infrastructure, such as bike lanes and pedestrian bridges, into State highway improvement projects within Moreno Valley, including planned improvements along State Route 60. This aligns with Action C.4-C, which focuses on coordinating with State and regional agencies to improve transportation facilities and services.

70. *Caltrans. Active Transportation Program (ATP). Accessed at:* **https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/active-transportation-program**

71. *California Air Resources Board (CARB). Sustainable Transportation Equity Project. Accessed at:* **https://ww2.arb.ca.gov/our-work/programs/sustainable-transportation-equity-project**

72. *Caltrans. Grant Management Branch - Sustainable Transportation Planning Grants. Accessed at:* **https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/regional-and-community-planning/sustainable-transportation-planning-grants**

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-1f	Engagement	Develop an educational campaign to promote the benefits of active transportation and available rebates. The campaign shall include: 1. The creation of a user-friendly webpage or app that provides real-time information on Moreno Valley's active transportation options, including bike lanes, trails, and transit routes. 2. Showcasing projects like the planned pedestrian bridge over the Perris Valley Storm Drain, which will connect key parts of Moreno Valley. 3. Hosting community events, such as "Open Streets" days, where sections of Moreno Valley are temporarily closed to vehicular traffic to encourage non-motorized transportation modes, such as walking and biking. 4. Informing community members on the availability of rebates for electric bicycles through CARB and Pedal Ahead's California E-Bike Incentive Project.[73]
T-1g	Equity	Prioritize the development of active transportation projects through the Bicycle Master Plan update in Moreno Valley's disadvantaged communities, consistent with Goal C-1 of the Circulation Element, which emphasizes the importance of equitable access to transportation facilities. Additionally, focus on projects in neighborhoods with limited pedestrian and bicycle infrastructure, such as those in the eastern and southern parts of Moreno Valley, where connectivity improvements are most needed.
GHG Reduction Potential		**2030:** 2,352 MT CO_2e **2045:** 6,079 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community Mobility Improvements • Enhanced Community Character

73. *California E-Bike Incentive Project. Accessed at:* ***https://www.ebikeincentives.org/***

Transportation		
Measure/ Action Number	**Pillar**	**Action**
Measure T-2	**Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.**	
T-2a	Feasibility Study Partnership	Work with Riverside Transit Agency (RTA) to identify public and multi-modal transportation (including micro-transit services which are flexible, on-demand transportation services like shuttle services) opportunities in Moreno Valley, as aligned with Moreno Valley's Circulation Element Goal C-2. The identification shall involve assessing current public transit routes, schedules, and infrastructure in Moreno Valley; and identifying gaps in service and areas for improvement. Identified opportunities shall: 1. Prioritize enhancing connections between residential neighborhoods and key employment centers like the Moreno Valley Business Park, the planned World Logistics Center, the Moreno Valley Mall, and the Riverside University Health System Medical Center. 2. Identify infrastructure improvements for safety and comfort including installing seating, shading, and lighting at bus stops, particularly in neighborhoods that currently lack adequate transit facilities. 3. Work with RTA to improve first- and last-mile access to major transit hubs, such as the Moreno Valley/March Field Metrolink Station, through connections to active transportation networks and micro-transit services.
T-2b	Feasibility Study	Conduct annual average vehicle ridership (AVR) surveys of Moreno Valley's businesses to measure weekday AVR and mode split among commuters. The survey shall also identify perceived barriers to sustainable commuting options (such as carpooling, public transportation, biking, and telecommuting) and assess interest in transportation-related infrastructure improvements and resources aimed at increasing participation in alternative transportation modes.
T-2c	Structural Change	Analyze and revise parking policies to support increased public transportation use, as outlined in Goal C-5 of the Circulation Element, which encourages the integration of land use and transportation planning. Enforce Aseembly Bill (AB) 2097 (2022)'s requirements for buildings near High Quality Transit Stops to eliminate or reduce parking minimums and implement parking maximums to discourage excessive vehicle use.
T-2d	Structural Change Partnership	Work closely with RTA to implement the public and multi-modal transportation opportunities identified in Moreno Valley (through Action T-2a) and improvements to bus routes in Moreno Valley outlined in RTA's Short Range Transit Plan.[74] Implementation shall be done in line with Goal C-5 of the Circulation Element, which emphasizes enhancing transportation options to reduce vehicle trips.

74. *Riverside Transit Agency. Short Range Transit Plan. Accessed at:* ***https://www.slorta.org/wordpress/wp-content/uploads/RTA_SRTP_WorkingPaper_8.pdf***

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-2e	Equity	Focus Action T-2a's efforts on making public and multi-modal transportation more accessible and comfortable in disadvantaged community census tracts, consistent with Goal C-2 of the Circulation Element, which advocates for equitable transportation access. Include direct outreach to community members living on low incomes, seniors, and students to identify opportunities to improve accessibility.
T-2f	Engagement	Cross-promote RTA's public transit and multi-modal transportation options on the City's website and at Moreno Valley community events (e.g., the Moreno Valley Regional Job Fair, Farmers Markets, and Earth Day Celebration) and community centers (e.g., the Moreno Valley Senior Center, Moreno Valley Business and Employment Resource Center, and City Library). Include promotion of: 1. The environmental benefits of public transit and multi-modal transportation uses, including vehicle miles traveled (VMT) reduction. 2. Available RTA bus routes in Moreno Valley, including up-to-date routes and schedules, scheduled improvements/expansions, and RTA's GoMobile App to purchase passes, plan trips, and track buses. 3. RTA's subsidized transit programs including summer fare discounts (i.e., 25-cent fares from June 1 to August 31) and reduced fare offerings (e.g., seniors and disabled; veterans; active military, police, and fire personnel; jury duty; youth; and children).
T-2g	Funding Partnership	Work with RTA and other regional partners continue offering subsidized transit programs (i.e., free or discounted bus passes) for seniors and students (i.e., Go-Pass/U-Pass)[75] and to develop subsidized transit programs for residents living on low incomes or in disadvantaged communities, as aligned with Goal C-2 of the Circulation Element. Additionally, seek funding opportunities through State and federal grants, such as the Low Carbon Transit Operations Program (LCTOP),[76] to support these initiatives.
GHG Reduction Potential		**2030:** 9,767 MT CO_2e **2045:** 59,435 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Community Mobility Improvements • Enhanced Community Character

75. *Riverside Transit Agency. Go-Pass / U-Pass. Accessed at:* **https://www.riversidetransit.com/index.php/fares-a-passes/go-pass-u-pass**

76. *Caltrans. Low Carbon Transit Operations Program (LCTOP). Accessed at:* **https://dot.ca.gov/programs/rail/low-carbon-transit-operations-program-lctop**

Transportation		
Measure/ Action Number	**Pillar**	**Action**
Measure T-3	**Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce vehicle miles traveled.**	
T-3a	Feasibility Study	Complete the development of the broadband internet service plan to expand access to robust broadband internet service in the community and increase opportunities for residents to work from home. The plan shall include: 1. An inventory of existing systems and service availability to understand the current broadband internet service environment. 2. Community outreach, including an online broadband internet service survey and workshops to engage stakeholders about their needs. Outreach shall include engagement to understand hurdles and identify solutions for community members to work from home as well as partnership with community-based organizations such as RIVCOconnect[77] to understand hurdles and solutions for equitable access to broadband internet service in the community. 3. A high-level network design that leverages existing assets and supports the needs of the City and the community that will use the network. 4. A financial and cost/benefit analysis to identify the business and financial sustainability of the program.
T-3b	Structural Change	Continue to maintain a list of recommended Transportation Demand Management strategies for employers and new development to adopt in accordance with Action C.5-B of the Circulation Element. Include in the list strategies that prove businesses accommodate and encourage employees to work from home (e.g., hybrid and alternate work schedules) and use public transit (e.g., flexible schedules that accommodate public transit delays).
T-3c	Funding	Continue to offer Hire MoVal[78] incentives to businesses to encourage businesses to employ Moreno Valley residents to reduce VMT. Monitor the use of the incentives and expand the program to incorporate resources and incentives (e.g., stipends, license discounts) for businesses that maintain remote work policies for employees.
T-3d	Engagement	Develop an educational campaign to promote the benefits of remote work and available resources. The campaign shall highlight cost savings, work-life balance improvements, and environmental benefits of reduced VMT as well as strategies to help employees maintain productivity, collaboration, and energy-efficiency in home offices.

77. *RivcoConnect is a Riverside County initiative that expands access to affordable, high-speed internet and digital literacy resources. It works with local communities to improve broadband infrastructure, offer low-cost internet plans, and provide digital skills training, including programs like "Tech On Wheels" that bring Wi-Fi and device support to underserved areas. Accessed at:* ***https://rivcoconnect.org/***

78. *Hire MoVal is a City of Moreno Valley program that offers incentives to businesses for hiring local residents, including stipends for hiring graduates and veterans, job advertising assistance, and business license fee waivers. Accessed at:* ***https://moval.gov/edd/hire-moval.html***

Transportation

Measure/ Action Number	Pillar	Action
T-3e	Partnership Equity	Partner with RIVCOconnect to improve broadband connectivity and high-speed internet access to disadvantaged communities in Moreno Valley. Directly connect residents living on low incomes to their services and Riverside County's Tech on Wheels program.
GHG Reduction Potential		**2030:** 61,426 MT CO_2e **2045:** 125,963 MT CO_2e
Co-benefits		• Cleaner Air and Healthier Communities • Community and Business Resilience
Measure T-4	**Achieve zero-emission vehicle adoption rates of 31% for passenger vehicles and 19% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.**	
T-4a	Feasibility Study	Identify and engage with commercial vehicle fleets in Moreno Valley to identify opportunities for and hurdles to decarbonization. This effort shall: 1. Identify commercial vehicle fleets, including those belonging to small businesses, those subject to the California Air Resources Board's (CARB) Advanced Clean Fleets Regulation,[79] and those with significant decarbonization potential, to focus Action T-4d's outreach campaign on. 2. Engage with commercial vehicle fleets to understand hurdles to decarbonization including gaps in Moreno Valley's charging and refueling network. 3. Engage Moreno Valley Electric Utility (MVU) with commercial vehicle fleets to identify electric infrastructure and capacity hurdles to fleet decarbonization and opportunities to address them. 4. Explore opportunities to support businesses in developing cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of commercial zero-emission vehicles (ZEV).
T-4b	Structural Change	Develop and adopt an electric vehicle (EV) reach code by 2026 requiring new multifamily and commercial construction install the minimum number of EV chargers based on CalGreen Tier 2 requirements. Incorporate the Moreno Valley EV Charging Infrastructure Master Plan's[80] recommendations for charger density and location into the reach code requirements.

79. *California Air Resources Board (CARB). Advanced Clean Fleets. Accessed at:* ***https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets***

80. *City of Moreno Valley. Electric Vehicle Charging Infrastructure Master Plan. Accessed at:* ***https://moreno-valley.ca.us/departments/public-works/transportation/pdfs/MV-EV-ChargingInfrastructure-Plan.pdf***

Transportation		
Measure/ Action Number	Pillar	Action
T-4c	Structural Change Partnership	Through public-private partnerships, install 961 new publicly accessible chargers by 2030 and 7,376 by 2045. Prioritize installation locations and charger types (i.e., Level 2 and direct current fast charging [DCFC]) based on guidance from the Moreno Valley EV Charging Infrastructure Master Plan[81] (including the equity analysis) and leverage partnerships identified in the Master Plan to fund, operate, and maintain the installations.

81. *City of Moreno Valley. 2024. Moreno Valley Electric Vehicle Charging Infrastructure Master Plan. Accessed at:* ***https://moreno-valley.ca.us/departments/public-works/transportation/pdfs/MV-EV-ChargingInfrastructure-Plan.pdf***

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-4d	Engagement	Launch a public outreach campaign to inform residents and commercial vehicle fleet owners about the benefits of ZEVs (including environmental, health, and economic advantages) and the available incentives for ZEVs. This campaign shall: 1. Continue to promote MVU's 555 EV Program for residential customers and MVU's Clean EV Program for commercial customers.[82] 2. Promote the availability of Southern California Edison (SCE)'s Charge Ready program,[83] Pre-Owned EV Rebates,[84] and Clean Vehicle Rebate Project[85] to residents and businesses. 3. Promote the availability of CARB's Truck and Bus Vouchers (HVIP)[86] and Cal Fleet Advisors' fleet electrification concierge service[87] to businesses and commercial vehicle fleet owners subject to the Advanced Clean Fleets Regulation (identified in Action T-4a). 4. Highlight case studies and testimonials from businesses that have successfully adopted ZEVs, including those that have used ZEV purchases, ZEV truck visits, and ZEV charging/fueling infrastructure as a way to comply with South Coast Air Quality Management District's (AQMD) Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. 5. Host webinars and informational sessions connecting the commercial vehicle fleets with significant decarbonization potential (identified in Action T-4a) with the Low Carbon Fuel Standard's[88] infrastructure, fueling, and solar (i.e., low carbon intensity electricity) credits for ZEV charging and fueling to accelerate commercial ZEV adoption. Likewise, connect businesses to the Low Carbon Fuel Standard's workplace EV charging credits to support passenger ZEV adoption. 6. Perform direct outreach to the small businesses with commercial vehicle fleets (identified in Action T-4a) to connect them with incentives for smaller fleets such as the California Capital Access Program's Zero-Emission Heavy-Duty Programs.[89]
T-4e	Partnership	Collaborate with local unions, industrial groups, and Moreno Valley College to create training programs focused on the installation and maintenance of ZEVs and ZEV charging/fueling infrastructure. This program shall: 1. Offer comprehensive training or apprenticeships that prepare the local workforce for green jobs in vehicle electrification such as ZEV mechanics and ZEV charging and fueling technicians. 2. Work closely with industry partners to align training with current and future market demands.

82. *City of Moreno Valley. Electric Vehicle Incentives. Accessed at:* **https://www.moval.org/mvu/ev-incentives.html**
83. *Southern California Edison (SCE). Charge Ready Program. Accessed at:* **https://evhome.sce.com/**
84. *SCE. Pre-Owned Electric Vehicle Rebate Program. Accessed at:* **https://evrebates.sce.com/**
85. *California Clean Vehicle Rebate Project. Accessed at:* **https://cleanvehiclerebate.org/en**
86. *California Air Resources Board (CARB). Clean Truck & Bus Vouchers (HVIP). Accessed at:* **https://ww2.arb.ca.gov/our-work/programs/clean-truck-bus-vouchers-hvip**
87. *Cal Fleet Advisor. Accessed at:* **https://calfleetadvisor.org/**
88. *CARB. Low Carbon Fuel Standard. Accessed at:* **https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard**
89. *California Pollution Control Financing Authority. CalCAP Zero-Emission Heavy-Duty Programs. Accessed at:* **https://www.treasurer.ca.gov/cpcfa/calcap/zero-emission/index.asp**

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-4f	Equity Partnership	Work with Western Riverside Council of Governments (WRCOG) to implement the Western Riverside County Municipal Green Zones Pilot Project[90] to deploy zero emission car-share vehicles in Moreno Valley. Monitor the implementation of the pilot project and use the results to pursue partnerships with private ZEV car-share providers (e.g., ZipCar[91]) to bring more ZEV car-share vehicles to Moreno Valley to provide ZEV access to all residents and improve mobility options in the community.
T-4g	Funding	Pursue funding to support Action T-4c's publicly accessible EV chargers including Low Carbon Fuel Standard's credits for public EV charging. Additionally, align the expansion scale-up of MVU's GREEN MoVal programs (Action BE-5c) with panel upgrades needed to support EV charging infrastructure.
GHG Reduction Potential		**2030:** 111,067 MT CO_2e **2045:** 646,245 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities
Measure T-5	**Implement programs to support California Air Resources Board and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.**	
T-5a	Structural Change	Develop a phased ordinance by 2027 to ban the local operation of gasoline and diesel-powered off-road equipment by type. To align with California Air Resources Board (CARB) regulations, the ordinance shall enforce the use of R99 and R100 renewable diesel per CARB's Off-Road Diesel-Fueled Fleets Regulation[92] requirements and enforce the sale of new zero-emission small off-road engines (SORE) per CARB's SORE regulations.[93]

90. *CEQA. Western Riverside County Municipal Green Zones Pilot Project. Accessed at:* **https://ceqanet.lci.ca.gov/2024081233**
91. *Zipcar. Wheels when you want them. Accessed at:* **https://www.zipcar.com/**
92. *California Air Resources Board (CARB). In-Use Off-Road Diesel-Fueled Fleets Regulation. Accessed at:* **https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation**
93. *CARB. Small Off-Road Engines (SORE). Accessed at:* **https://ww2.arb.ca.gov/our-work/programs/small-off-road-engines-sore**

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-5b	Feasibility Study	Identify and engage with off-road equipment and vehicle fleets in Moreno Valley to identify opportunities for and hurdles to decarbonization. This effort shall: 1. Identify off-road vehicle and equipment fleets, including those belonging to small businesses and those with significant decarbonization potential, to focus Action T-5d's outreach campaign on. 2. Inventory the current off-road equipment and vehicle types used in Moreno Valley and identify available electric or biofuel alternatives available for each equipment type. 3. Explore opportunities to support businesses in developing cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of zero-emission off-road equipment and vehicles.
T-5c	Equity Funding	Collaborate with South Coast AQMD to review existing off-road equipment replacement rebate programs for procedural equity and connect small businesses (identified in Action T-5b), as well as residents living on low incomes, to these rebates. This shall include offering grant application support to these small businesses.
T-5d	Engagement	Launch a public outreach campaign to inform contractors, residents, and off-road fleet owners in Moreno Valley about the health and safety benefits of transitioning to zero-emission off-road equipment and vehicles, and funding opportunities. The campaign shall: 1. Work with South Coast AQMD to promote the availability of off-road rebates under their Residential and Commercial Electric Lawn and Garden Equipment Rebate Programs[94] and Carl Moyer Program.[95] Additionally, promote the availability of CARB's Clean Off-Road Equipment Voucher Incentive Program.[96] 2. Highlight case studies and testimonials from businesses that have successfully adopted zero-emission off-road equipment and vehicles, including those that have used zero-emission yard trucks as a way to comply with South Coast AQMD's Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. 3. Host webinars and informational sessions connecting the off-road fleet owners with significant decarbonization potential (identified in Action T-5b) with the Low Carbon Fuel Standard's credits for off-road transportation.

94. *South Coast Air Quality Management District (AQMD). Electric Lawn & Garden Programs. Accessed at:* ***https://www.aqmd.gov/home/programs/community/electric-lawn-and-garden-programs***

95. *South Coast Air Quality Management District (AQMD). The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program). Accessed at:* ***https://www.aqmd.gov/home/programs/business/carl-moyer-memorial-air-quality-standards-attainment-(carl-moyer)-program***

96. *California Air Resources Board (CARB). Clean Off-Road Equipment Vouchers. Accessed at:* ***https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project***

Transportation		
Measure/ Action Number	**Pillar**	**Action**
T-5e	Partnership	Collaborate with neighboring jurisdictions and South Coast AQMD to establish an Off-road Equipment Replacement Program. This program shall provide free consultations to fleet operators identified in the feasibility study, helping them transition to zero-emission equipment. The program shall also offer support for accessing rebates and incentives and connect operators with local repair services capable of maintaining the new equipment.
GHG Reduction Potential		**2030:** 18,335 MT CO_2e **2045:** 38,918 MT CO_2e
Co-benefits		• Cleaner Air and Healthier Communities

Solid Waste Sector

Sustainable solid waste management is vital for a healthy Moreno Valley. When organic waste decomposes in landfills, it produces methane, a potent GHG. Diverting organics from landfills avoids these methane emissions and repurposes the waste into valuable resources for community use such as compost and surplus edible food. California's SB 1383 (2016) requires a 75 percent reduction in landfilled organic waste from 2014 levels by 2025 to help communities leverage these resources and reduce GHG emissions. Through Measure SW-1, Moreno Valley intends to achieve and maintain this goal by 2030. By updating franchise agreements, monitoring contamination, and performing meaningful community outreach with regional partners, Moreno Valley will divert organic waste from the landfill and recover edible food. Together, these efforts will help reduce GHG emissions, create local resilience, and value organics as a community asset.

Table 3-5. Solid Waste Measures and Actions Table

Solid Waste		
Measure/ Action Number	**Pillar**	**Action**
Measure SW-1	**Achieve, monitor, and maintain Senate Bill 1383 (2016) requirements to reduce waste sent to landfills by 75% by 2030, below 2014 levels.**	
SW-1a	Feasibility Study	Partner with Waste Management[97] to conduct annual community waste characterization studies to determine organic waste landfill and diversion rates and track community progress on Senate Bill (SB) 1383 (2016) compliance. Use findings to inform policies and programs aimed at increasing organic waste diversion rates and reducing contamination.
SW-1b	Structural Change	Review the City's existing waste hauler franchise agreement(s) with Waste Management and amend as needed to include SB 1383 (2016) organic waste diversion compliance. Include a new SB 1383 (2016) fee to provide a sustainable revenue source for a new full- or part-time City staff person to manage organic waste diversion programs. The agreement shall include: 1. Implementation of contamination checks on routes to identify compost and recycling contamination and issue fees for incorrectly sorted materials with sensitivity to shared collection. Earmark the fee revenues to fund to the new City staff position and implementation City programs to increase communitywide organic waste diversion. 2. Quarterly meetings between Waste Management and the City to review progress reports, the annual waste characterization results (Action SW-1a), and establish prioritized actions, as needed, for Waste Management to implement to improve SB 1383 (2016) compliance. 3. Adding organics collection and recycling bins and service to public areas, where needed. Public areas shall include a community compost hub at the Moreno Valley Community Demonstration Garden to increase communitywide access to composting services. 4. Free food scrap collection pail distribution to single-family and multi-family residences. 5. Distribution of informational material to Waste Management customers to educate community members on the availability of curbside composting services and proper disposal methods to reduce contamination. 6. Establishing composting and recycling services for special events such as Fun Color Run, El Grito, MoVal Movies, MoVal Rocks!, Springtastic, Multicultural & Art Festival, Farmers Market, etc.

97. *The City of Moreno Valley provides trash, recycling, organic waste, and special waste handling services to residents and businesses through a contract with Waste Management. Waste Management is a provider of comprehensive waste management services.*

Solid Waste		
Measure/ Action Number	**Pillar**	**Action**
SW-1c	Engagement Partnership	Work with the Riverside County Department of Waste Resources to educate Moreno Valley community members on organic waste diversion and recycling. Education efforts shall include: 1. Creation of multi-lingual training/education material to educate residents and businesses on the availability of curbside composting, benefits of organic waste diversion, and proper disposal methods. 2. Promotion of the Riverside County Department of Waste Resources' free classes on backyard composting, food waste, zero waste, and more. 3. Access to these resources the City's website.
SW-1d	Engagement Partnership	Partner with the Riverside County Department of Waste Resources to continue offering school resources (i.e., free worm bin kits, free composting bins, composting program mentors and volunteers, landfill tours, and speakers on waste reduction and sustainability) to Moreno Valley Unified School District (MVUSD) and Val Verde Unified School District to educate students on the importance of composting and waste diversion as well as proper disposal methods.
SW-1e	Engagement Partnership	Partner with the Western Riverside Council of Governments' (WRCOG) Regional Food Rescue Program[98] to identify commercial food generators in Moreno Valley and directly connect them with the Regional Food Rescue Program's Food Recovery Network,[99] CAREIT Food Recovery App,[100] and 1-on-1 program training as well as the City's Food Recovery Program. Efforts shall support compliance with SB 1383 (2016) to recover at least 20% of edible food currently disposed of.
SW-1f	Equity	Continue offering the Multifamily Recycling Program Support[101] (i.e., site visits and waste reduction consultations, presentations at tenant associations and community room events, information for tenant newsletters, emails, and packets, and assistance promoting reuse and waste prevention) to increase organic waste diversion in rental and multi-family housing. Evaluate expanding the program to connect participants with Waste Management to receive free food scrap collection pails. Monitor the program's participation rates and update the program as needed to optimize organic waste diversion.

98. Western Riverside Council of Governments. WRCOG Regional Food Rescue Program. Accessed at: **https://wrcog.us/336/WRCOG-Regional-Food-Rescue-Program**

99. Ibid.

100. CAREIT. Share it with Careit. Food Donation + Rescue Software. Accessed at: **https://careit.com/**

101. City of Moreno Valley. Multifamily Programs. Accessed at: **https://moval.gov/resident_services/waste/business-multifamily.html**

Solid Waste		
Measure/ Action Number	**Pillar**	**Action**
SW-1g	Funding	Pursue funding opportunities through State programs like the California's Department of Resources Recycling and Recovery's (CalRecycle) Organics Grant Program[102] or California Climate Investments[103] to support the expansion of organic waste diversion programs and the implementation of SB 1383 (2016) requirements in Moreno Valley.
SW-1h	Partnership	Continue to work with WRCOG's Solid Waste Cooperative to regionally address the SB 1383 (2016) organic waste diversion goals. Work with the cooperative to pursue Action SW-1h's funding opportunities. Additionally, include attendance of WRCOG's quarterly Solid Waste Committee meeting and preparation of quarterly reports on Moreno Valley's organic waste diversion progress (to be presented at the quarterly committee meetings and submitted by the committee to CalRecycle) in the new City staff person's role (Action SW-1b).
GHG Reduction Potential		**2030:** 195,661 MT CO_2e **2045:** 282,198 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities

102. CalRecycle. Organics Grant Program. Accessed at: **https://calrecycle.ca.gov/funding/organics/**

103. California Climate Investments. Cap-and-Trade Dollars at Work. Accessed at: **https://www.caclimateinvestments.ca.gov/**

Water and Wastewater Sector

Water and wastewater operations can be optimized to lower both energy consumption and GHG emissions. In residential and commercial settings, water is used indoors for cooking, cleaning, and bathing, and outdoors for irrigation. Reducing water use cuts the energy needed for pumping and treatment, while also minimizing wastewater generation. Measure WW-1 focuses on working with the Eastern Municipal Water District (EMWD) and the Box Springs Mutual Water Company (BSMWC)—the primary water and wastewater treatment suppliers in Moreno Valley—to lower potable water demand and explore expanded recycled water service. These efforts will not only reduce GHG emissions by lowering related energy needs but also help maintain robust, adaptable water infrastructure that meets current and future needs. Frequent drought cycles make decreasing the community's reliance on potable water sources a critical component of the community's resilience. Through partnerships on planning efforts and community education, Moreno Valley will help safeguard a sustainable water supply for the community.

Table 3-6. Water and Wastewater Measures and Actions Table

Water and Wastewater		
Measure/ Action Number	**Pillar**	**Action**
Measure WW-1	**Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.**	
WW-1a	Structural Change Partnership	Partner with Eastern Municipal Water District (EMWD) to support and implement updates to their Urban Water Management Plan (UWMP) every five years, as required by the State. These updates shall include identified demand reduction actions to comply with the State's "Making Water Conservation a Way of Life" regulations.[104] Specific actions shall include: 1. Amending the Water Shortage Contingency Plans[105] to enforce water waste restrictions for households, businesses, and public infrastructure in Moreno Valley. 2. Engaging with large water users to develop an On-Site Water Reuse Plan that maximizes local water supplies and reduces the energy intensity of distribution. 3. Updating the City's Model Water Efficient Landscape Ordinance,[106] as needed, and working with regional partners to keep developers in Moreno Valley informed of these requirements. 4. Promoting City ordinances or guidelines developed by EMWD for the installation of dual-plumbing systems that utilize greywater or recycled water for irrigation in new residential and commercial constructions. 5. Enhancing community engagement efforts, especially among residents living on low-to-moderate incomes, to increase awareness of water conservation incentives, rebates, and programs aimed at reducing per capita water use. 6. Revising water and wastewater rates in Moreno Valley as necessary to cover the cost of service and promote conservation efforts.
WW-1b	Engagement	Work with EMWD and Box Springs Mutual Water Company (BSMWC) to develop water conservation promotional materials, programs, and outreach efforts. Continue to offer and expand water conservation programs to the community including water education program for schools, water-wise landscape classes, and incentives for water conservation upgrades (e.g., free water conserving devices, rebates for rainwater collection systems).
WW-1c	Feasibility Study	Work with EMWD and BSMWC to assess the feasibility and necessity of expanding the recycled water system within Moreno Valley, identifying key areas that could benefit from recycled water use. Based on the results of the assessment, identify projects for the relevant utility agencies to implement to expand recycled water supply and access in Moreno Valley.
GHG Reduction Potential		**2030:** Supportive **2045:** Supportive

104. *State Water Resources Control Board. Making Conservation a California Way of Life Regulation. Accessed at:* ***https://www.waterboards.ca.gov/conservation/regs/water_efficiency_legislation.html***

105. *Eastern Municipal Water District (EMWD). Water Shortage Contingency Plan. Accessed at:* ***https://www.emwd.org/what-we-do/water-supply/water-supply-status/water-shortage-contingency-plan***

106. *City of Moreno Valley. Municipal Code. Chapter 9.17 Landscape and Water Efficiency Requirements. Accessed at:* ***https://ecode360.com/43233174***

Water and Wastewater		
Measure/ Action Number	Pillar	Action
Co-benefits		• Cleaner Air and Healthier Communities • Community and Business Resilience

Carbon Sequestration Sector

Moreno Valley's plan for reducing GHG emissions leverages natural systems including parks, open spaces, and tree-lined streets to capture and store atmospheric carbon. These nature-based strategies are not only crucial for working towards Moreno Valley's long-term carbon neutrality target but also provide multiple benefits, including localized cooling, improved air quality, and neighborhood beautification.

Measure CS-1 centers on procuring and distributing compost citywide in accordance with SB 1383 (2016). SB 1383 (2016) requires communities to procure recovered organic waste products (0.08 short tons per person) including compost. Along with local carbon sequestration, this requirement provides many benefits. By applying compost to community lands, Moreno Valley will meet SB 1383 (2016) requirements, sequester carbon, enrich soil health, and repurpose the valuable resources captured under Measure SW-1 to work towards a closed-loop system. This measure aims to achieve these benefits through strategic regional partnerships and meaningful community outreach and education.

Measure CS-2 focuses on carbon sequestration by protecting existing trees and Moreno Valley's urban forest. Trees are not only important for their carbon sequestration benefits but also for their benefits to mitigate urban heat island effect, improve local air quality, increase stormwater retention, lower utility bills, and beautify neighborhoods. To realize these benefits, Moreno Valley will create an Urban Forest Master Plan to identify areas needing tree coverage, prioritize communities vulnerable to heat, and guide species selection while aligning with the City's Tree Care ordinance. Altogether, these carbons sequestration measures will chart a course towards a carbon-neutral future while building resilience against climate impacts.

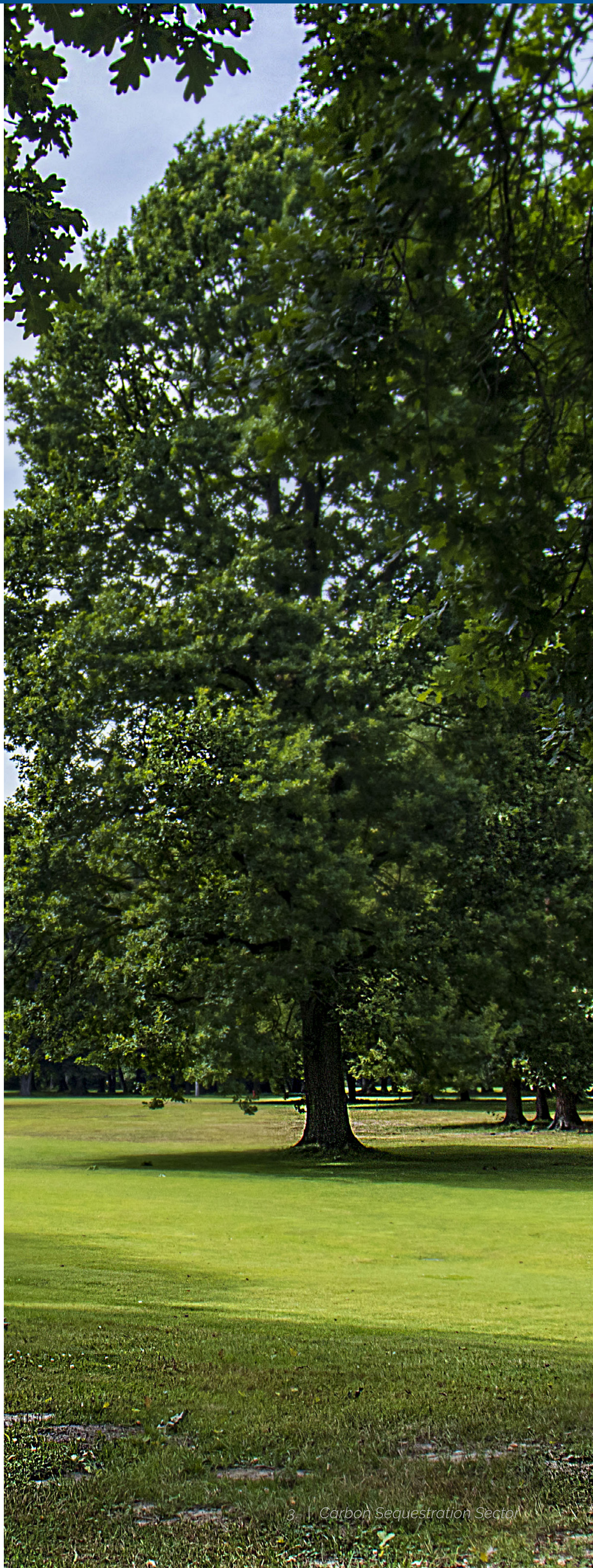


Table 3-7. Carbon Sequestration Measures and Actions Table

Carbon Sequestration		
Measure/ Action Number	**Pillar**	**Action**
Measure CS-1	**Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve Senate Bill 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.**	
CS-1a	Structural Change	Enhance compost application in Moreno Valley to comply with Senate Bill (SB) 1383 (2016) through: 1. Enforcing compliance with SB 1383 (2016) in Moreno Valley by establishing a minimum annual level of compost application on public and private lands. 2. Maintaining procurement policies to purchase recovered organic waste products, including compost, in accordance with SB 1383 (2016) requirements. 3. Continuing the regional compost broker program in partnership with Waste Management, Zero Foodprint, and the Western Riverside Council of Governments' (WRCOG) Solid Waste Cooperative.
CS-1b	Engagement	Collaborate with Waste Management and the Riverside County Department of Waste Resources to create and distribute promotional materials and educational resources to residents, businesses, and developers on the benefits of compost use, where compost can be obtained (including the free compost offered by the Riverside County Department of Waste Resources at the Lamb Canyon Landfill and Badlands Landfill), and how it can be applied effectively in landscaping and agricultural projects.
CS-1c	Equity	Perform direct outreach to residents living on low incomes, small businesses, and community gardens to connect them with the free compost offered by the Riverside County Department of Water Resources at the Lamb Canyon Landfill and Badlands Landfill. Work with the Riverside County Department of Water Resources to track the compost tonnage used by Moreno Valley community members.
CS-1d	Feasibility Study	Conduct a study to identify applicable locations (including City-owned properties, schools, and open spaces) and the quantity of compost that can be applied within the Moreno Valley community to help meet the procurement requirements of SB 1383 (2016). As part of study, evaluate other carbon sequestration opportunities associated with soil amendments such as biochar.[107]
CS-1e	Funding	Dedicate staff time and resources to researching pathways for maintaining SB 1383 (2016) compliance and applying the compost to lands within the community, including exploring grant funding opportunities for compost procurement and distribution incentive programs.

107.Note that biochar is not considered SB 1383 (2016) recovered waste product; however, biochar is a known soil amendment opportunity with enhanced carbon sequestration which is why it should also be considered as part of the soil amendment study.

Carbon Sequestration		
Measure/ Action Number	**Pillar**	**Action**
CS-1f	Partnership	Continue partnerships with Waste Management, Zero Foodprint,[108] and the WRCOG's Solid Waste Cooperative[109] to use the regional compost broker program to facilitate the distribution of high-quality compost within the Moreno Valley community to meet SB 1383 (2016) organics procurement goals. Include locations identified in Action CS-1d's compost application study.
GHG Reduction Potential		**2030:** 4,424 MT CO_2e **2045:** 6,025 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Enhanced Community Character • Sustainable Resource Management • Community and Business Resilience
Measure CS-2	**Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.**	
CS-2a	Feasibility Study	Develop an Urban Forest Master Plan aimed at promoting tree health, enhancing urban resilience, and increasing the co-benefits of tree planting and shading, including urban heat relief. As part of this master plan: 1. Use the Tree Equity Score[110] or conduct an urban tree canopy study to establish a baseline of current canopy coverage by census block, set a percentage coverage goal for each census block, and identify priority planting areas to plant a minimum of 200 new trees per year beginning in 2026. Priority planting areas shall include disadvantaged communities. 2. Engage the community during the development of the plan to identify areas, including public gathering areas, to increase the community's access to trees and shade as well as identify hurdles and solutions to tree maintenance. Focus engagement within disadvantaged communities. The engagement shall include partnerships with local organizations such as Neighborhood Forest. 3. Align the plan with Moreno Valley's Tree Care ordinance[111] by integrating urban heat island mitigation strategies into the master plan and prioritizing tree species that are indigenous to the area and/or suitable for the local climate. Strategies shall include planting trees to create safe, inviting, and functional pedestrian and cyclist environments in residential developments, including street trees planted to provide shade on pedestrian paths, sidewalks, and walkways. 4. Establish a monitoring plan to regularly review the Tree Equity Score or conduct a new urban tree canopy study to assess progress.

108. *Zero Foodprint is a nonprofit organization dedicated to combating climate change by promoting regenerative agriculture practices. It unites farmers, food businesses, and consumers to fund and implement farming methods that sequester carbon in the soil, aiming to enhance food quality, support farmers, and restore the climate. Accessed at:* **https://www.zerofoodprint.org/**

109. *Western Riverside Council of Governments. Solid Waste & Recycling Program. Accessed at:* **https://wrcog.us/234/Solid-Waste-Cooperative**

110. *Tree Equity Score. Moreno Valley, CA. Accessed at:* **https://www.treeequityscore.org/map#9/33.9242/-117.2222**

111. *City of Moreno Valley. Municipal Code. Chapter 14.40 Tree Care. Accessed at:* **https://ecode360.com/43237349**

Carbon Sequestration		
Measure/ Action Number	**Pillar**	**Action**
CS-2b	Structural Change	Continue to enforce the tree maintenance and protection policies in Moreno Valley's Tree Care ordinance, including the financial penalties for violations of the ordinance. Additionally, continue to implement the Keep MoVal Beautiful initiatives[112] to enable residents, businesses, and community organizations to Adopt a Park, Trail, or Road to help increase tree maintenance and coverage.
CS-2c	Engagement	Update the City's Keep MoVal Beautiful website to highlight tree maintenance and plantings as a focus of the adopt a park, trail, and road programs. Include a webpage that lists the tree species that are indigenous to the area and/or suitable for the local climate and list local nurseries that carry such species. Additionally, continue to partner with Neighborhood Forest to offer children free trees for Earth Day. Pursue partnerships with Moreno Valley Unified School District and Val Verde Unified School District to offer the free trees at schools.
CS-2d	Equity	Prioritize tree plantings and engagement efforts for Action CS-2a's Urban Forest Master Plan in disadvantaged communities to reduce urban heat island effect and address hurdles to tree maintenance.
CS-2e	Funding	Secure funding through State and federal urban and community forestry grant programs such as CAL FIRE.[113] Continue to reach out to local businesses and community groups to acquire sponsors for the implementation of Keep MoVal Beautiful and for neighborhoods to fund Landscape Maintenance Districts. In Action CS-2a's Urban Forest Master Plan, establish a goal to apply for at least one major grant every three years to sustain and expand the plan's implementation.
GHG Reduction Potential		**2030:** 106 MT CO_2e **2045:** 1,487 MT CO_2e
Co-benefits		• Local Economic Development and Job Creation • Cleaner Air and Healthier Communities • Enhanced Community Character • Community and Business Resilience

112. *Keep MoVal Beautiful is a City of Moreno Valley initiative that engages community volunteers and businesses in beautifying parks, roads, and trails through clean-ups and enhancements. The program fosters civic pride and improves the quality of life in the community. Accessed at:* **https://moval.org/beautify/**

113. *CAL FIRE. Urban and Community Forestry Grants. Accessed at:* **https://www.fire.ca.gov/what-we-do/grants/urban-and-community-forestry-grants**

4.

IMPLEMENTATION AND MONITORING

This CAP serves as a roadmap for Moreno Valley to meet its 2030 GHG emissions reduction target and make substantial progress towards the 2045 carbon neutrality target through the implementation of measures and actions. These measures and actions outlined in this CAP align with State regulations and climate science while incorporating assumptions about technological advancements, adoption trends, and cost trajectories. This CAP will be regularly monitored and updated to effectively respond to emerging developments. This chapter outlines the implementation strategy for the CAP's measures and actions, detailing how progress will be tracked, reported, and integrated into future updates to keep Moreno Valley on the path to achieving the GHG emissions reduction targets.

Climate Action Plan Implementation

The effectiveness of Moreno Valley's CAP in achieving its goals relies on the cooperation, innovation, and participation by the City, residents, businesses, utilities, and other local organizations and agencies. Just as important is the ongoing monitoring of its measures and actions. The following sections detail the administration and staffing, funding strategies, and schedule to implement the CAP.

Climate Action Plan Administration and Staffing

To support successful implementation, the City will establish internal administration and staffing by:

- Appointing an Implementation Coordinator to oversee, manage, and coordinate the implementation of the CAP, as well as track metrics, analyze GHG emissions reduction progress, and report to the City Council.
- Forming a City Climate Action Team made up of responsible City department representatives to guide and assist the City's efforts in CAP implementation.

The Climate Action Team will lead CAP implementation, facilitate coordination across City departments responsible for implementing each action, and recommend updates and improvements to the CAP over time. Table 4-1 details the City department(s) responsible for leading implementation of each action.

Climate Action Plan Funding Strategies

A successful CAP requires adequate funding to successfully implement its measures and actions. While some initiatives may be low-cost or supported by existing City resources, many actions require dedicated funding to implement. Moreno Valley will primarily rely on grants and public-private partnerships as key funding mechanisms to implement the CAP while minimizing the fiscal burden on the City. Table 4-1 identifies potential funding sources for each measure, emphasizing the need for proactive financial planning to secure necessary resources.

Grants

State, federal, and philanthropic grants provide critical funding opportunities for climate action, offering billions of dollars for projects that align with GHG emissions reduction, equity, and climate resilience goals. By tracking available funding sources, monitoring grant cycles, and setting annual application goals, Moreno Valley can maximize its ability to secure competitive grants. Successful grant applications require strategic planning, strong partnerships, and data-driven proposals that demonstrate measurable benefits. The City will engage with regional agencies, leverage technical assistance programs, and continue to align its climate initiatives with State and federal priorities to increase the likelihood of funding awards.

Public-Private Partnerships

Public-private partnerships offer a valuable mechanism for financing large-scale climate projects. By collaborating with private investors, Moreno Valley can leverage external expertise and capital to accelerate the deployment of renewable energy, sustainable infrastructure, and resilient transportation systems. Public-private partnerships provide financial flexibility while fostering innovation, creating local jobs, and attracting green businesses. Establishing Moreno Valley as a leader in sustainability can further expand funding opportunities and strengthen regional collaborations. The City will actively explore partnership opportunities with the private sector to enhance project feasibility and long-term economic resilience.

Climate Action Plan Funding Monitoring and Implementation

To ensure the CAP remains financially viable, Moreno Valley will implement a structured approach to monitor and implement CAP funding. The City will maintain an ongoing inventory of available grants and private partners, monitor the number of applications submitted annually, and set clear targets for grant procurement and partnership development. By taking a proactive and diverse approach to funding, the City can sustain momentum in its climate efforts and effectively implement the CAP's measures and actions.

Climate Action Plan Implementation Timeline

A key element to successful CAP implementation is the monitoring and maintenance of an implementation timeline for the reduction measures. Implementation will follow a phased approach, with regular monitoring and adjustments throughout each phase. Table 4-1 identifies the implementation phase, defined below, for each action.

- **Phase 1** actions will occur in the short-term, within the next year (2026).
- **Phase 2** actions will occur over the mid-term (2027-2030).
- **Phase 3** actions will occur over the long-term, after dependent actions (e.g., feasibility studies) are implemented (2030+).

Climate Action Plan Implementation Summary

Table 4-1 summarizes the implementation timeline for each CAP action, the City department(s) responsible for leading implementation of each action, the key performance indicators and associated data sources that will be used to monitor progress of each measure, and the available funding opportunities for each measure.

Table 4-1. CAP Implementation Timeline, Responsibility, Monitoring Metrics, and Funding

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure C-1	**Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along the SR-60 corridor to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with California Air Resources Board's Advanced Clean Fleets regulation.**	**Entitled MDHD ZEV Refueling Projects (#) or Installed MDHD ZEV Refueling Stations (#)**	**Land Development Engineering Group, Transportation Engineering Division**	• **California's Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)** • **California Energy Commission's (CEC) Clean Transportation Program** • **CALSTART's Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles** • **California Air Resources Board (CARB)'s Low Carbon Fuel Standard** • **Public-private partnerships**
Action C-1a	Review and assess California Transportation Commission's (CTC) Clean Freight Corridor Efficiency Assessment, which lists SR-60 as a "priority freight corridor" and recommends a hydrogen refueling station in Moreno Valley; build off existing analyses to conduct a site-specific feasibility study which shall include: **1. Market Analysis** • Demand Forecasting: Analysis of current and future demand for zero-emission vehicle (ZEV) refueling among MDHD vehicles. This includes understanding the growth of ZEV fleets, trucking routes, and regional freight volumes. • Competitive Landscape: Assessment of existing and planned ZEV refueling stations in the area, including electric charging stations and hydrogen refueling stations. This shall cover the types of services offered, pricing models, and utilization rates. • Policy and Regulatory Environment: Examination of federal, State, and local regulations and incentives that impact ZEV adoption and refueling infrastructure, including emissions regulations, tax incentives, grants, and subsidies. **2. Site Analysis** • Location Selection: Identification of potential sites based on proximity to SR-60, industrial hubs, and distribution centers. Factors like land availability, zoning, and access to utilities would be key considerations. • Utility Infrastructure: Evaluation of the existing electric grid or hydrogen supply infrastructure, and what upgrades might be necessary to support the depot. This includes power capacity and/or potential for renewable energy integration.	Transportation Engineering Division, Community Development	Phase 1	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action C-1b	Identify and secure funding for the planning and development of the medium- and heavy-duty (MDHD) ZEV refueling depot through State funding sources such as: 1. California's Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) program which has the goal of building more than 60 hydrogen fueling stations for Class 6-8 fuel cell electric vehicles (FCEV). 2. The California Energy Commission's (CEC) Clean Transportation Program and CALSTART's Energy Infrastructure Incentives for Zero-Emission Commercial Vehicles which includes $1.02B in funding for zero-emission truck and bus infrastructure to be distributed between 2023 and 2027 (Class 2b-8). 3. California Air Resources Board (CARB)'s Low Carbon Fuel Standard which provides infrastructure credits based on unused fueling capacity to fund the initial build-out of ZEV refueling infrastructure when fuel demand is low in early years.	Transportation Engineering Division, MVU, Public Works	Phase 1-2	
Action C-1c	Establish a project-specific partnership with local and/or regional agencies such as Southern California Association of Governments (SCAG), South Coast Air Quality Management District (AQMD), Riverside County Transportation Commission (RCTC), and/or Western Riverside Council of Governments' (WRCOG) Western Riverside County Clean Cities Coalition to pursue State and federal funding. Additionally, establish partnerships with utility providers (i.e., Moreno Valley Electric Utility and Southern California Edison) as part of the feasibility study to evaluate existing energy infrastructure at the site and facilitate effective planning and deployment of the refueling depot.	Community Development, Transportation Engineering Division	Phase 1-2	
Action C-1d	Identify potential private-sector project sponsors, such as the Ports of Los Angeles and Long Beach, warehouse owners and operators, utilities, truck stops and fuel station owners, private charging station networks, and ZEV truck manufacturers (that have expressed intent to invest in ZEV infrastructure), to understand future demand of ZEV infrastructure, pursue financing opportunities, and facilitate development/implementation.	Economic Development	Phase 1-2	
Action C-1e	Develop an outreach and engagement program with community-based organizations (CBO) to address concerns around the proposed development, collect feedback, and educate residents/stakeholders on the effects additional refueling infrastructure has on advancing MDHD ZEV adoption and therefore public health benefits.	Community Development	Phase 1-2	
Action C-1f	Work with local fleet operators, vehicle operators, and fleet maintenance staff to support the development of a comprehensive training program, including hosting workforce development trainings to discuss the benefits and technical requirements of ZEV fleets and supporting infrastructure. Work with Moreno Valley College and Business and Employment Resource Center to develop, advertise, and promote workforce training programs to attract additional workforce support such as ZEV charging and fueling infrastructure technicians.	Economic Development	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action C-1g	Adopt a zoning ordinance to enforce Assembly Bill (AB) 1236 (2015), AB 970 (2021), and Senate Bill (SB) 1418 (2024)'s requirements for an expedited, streamlined permitting process for ZEV refueling stations (i.e., electric vehicle (EV) charging and hydrogen-fueling stations). Refer to the recommendations in the California Governor's Office of Business and Economic Development's EV Charging Station Permitting Guidebook or the Hydrogen Station Permitting Guidebook, where necessary. Steps include: 1. **Establish ZEV Refueling Zones:** Designate suitable geographic areas near the SR-60 corridor suitable as ZEV Refueling development. 2. **Environmental Impact Assessment (EIA):** Analyze the environmental implications of constructing and operating the depot, including emissions, land use, noise, and potential hazards. 3. **Develop ZEV Refueling Zoning Guidelines:** Establish guidelines for permissible uses and restrictions that balance zero- emission vehicle refueling activity with the environment. The guidelines shall be carefully designed to mitigate factors like noise, traffic flow, and pollution levels.	Land Development Engineering Group, Planning Division	Phase 1	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure BE-1	**Procure or offset 75% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.**	**Share (%) of total MVU electricity from renewable energy sources**	**Source: California Energy Commission Power Content Labels[65]**	**• California Energy Commission Energy Conservation Assistance Act (ECAA) Program**
Action BE-1a	Conduct comprehensive electrification infrastructure and capacity studies to assess the long-term viability of transitioning Moreno Valley Electric Utility (MVU) to 100% renewable energy by 2045. This study shall include the following steps: 1. Develop a community-wide electric energy and demand forecast that estimates future electricity usage and peak demands driven by the adoption rates of building electrification, electric vehicles, and other renewable energy technologies. This forecast should guide the planning of necessary infrastructure upgrades and inform the scale of new renewable energy sources required. 2. Review and assess long-term energy contracts to identify opportunities for replacing non-renewable sources with renewable power or Renewable Energy Credits (RECs). This analysis shall consider the potential impacts on achieving the renewable energy goals and include recommendations for contract renegotiations or terminations that align with the 2030 and 2045 targets. 3. Using the developed energy and demand forecast, create an Integrated Resource Plan (IRP) to meet Moreno Valley's future energy needs and renewable energy targets through 2045. This plan shall explore various generation resources, such as local and remote renewable generation sites, energy storage solutions, microgrids, RECs and the development of virtual power plants. 4. Formalize a long-term electric capital improvement plan, focusing on the infrastructure improvements necessary to meet the anticipated increase in renewable energy generation and distribution. The plan shall prioritize infrastructure upgrades and projects that support the renewable energy transition, evaluating potential barriers, funding sources, and impacts on electricity rates.	MVU	Phase 1	
Action BE-1b	Develop a plan to convert all customers within the Moreno Valley City Limits to MVU. The plan shall prioritize customers that are lowest cost to acquire and establish phased targets for this conversion (e.g., share of annual revenue spent on converting Southern California Edison (SCE) customers to MVU).	MVU	Phase 2	

65. California Energy Commission (CEC). Power Content Label. Available at: *https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program/power-content-label*.

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-1c	Develop and adopt a resolution to adopt Action BE-1a's IRP that will allow MVU to exceed the requirements of Senate Bill (SB) 100 (2018) and SB 1020 (2022) by 2030 where 70% of the electricity mix is sourced from a combination of eligible renewable sources, carbon-free sources, and/or offset by RECs. As part of this resolution include actions of: 1. Establish valuation rankings for various generation types and projects. 2. Address the reliability and cost benefits of energy storage and/or demand response by 2030. 3. Indicate what percent geothermal and other low-carbon eligible renewables will continue to make up in the overall electricity mix. The resolution shall exceed State renewable energy mandates, making sure that the City's legal framework supports a seamless transition to renewable energy.	Planning Division, MVU	Phase 1	
Action BE-1d	Work with MVU and SCE to develop a multi-faceted public engagement strategy to educate the community about the importance of transitioning to renewable energy. Include a variety of communication channels, such as social media, local media outlets, workshops, town hall meetings, and school programs. Highlight the environmental and economic benefits of renewable energy, the City's goals, and how residents and businesses can participate. Additionally, work with SCE to encourage customers to opt-up to SCE's Green Rate 100% Option.	MVU, Community Development, Media and Communications Division	Phase 2-3	
Action BE-1e	Continue implementing MVU programs to provide equitable access to renewable energy for income-qualified families and those who require medical life-support devices (through the Energy Bill Assistance, Medical Baseline Plan, and Utility Tax Exemption programs), in line with the City of Moreno Valley 2021-2029 Housing Element (Housing Element) Program 6-A. Regularly review the programs to assess their effectiveness in reducing energy bill burdens amongst MVU customers.	Community Development, MVU	Phase 1-3	
Action BE-1f	Facilitate MVU customers in utilizing GREEN MoVal incentive and technical assistance programs targeting energy efficiency and solar installations, if applicable. Similarly, encourage SCE customers to utilize energy finance programs such as Western Riverside Council of Governments' (WRCOG) Property Assessed Clean Energy (PACE) program, in line with the Housing Element Program 6-A. These funds can be used to support energy efficiency upgrades, rooftop solar installations, and other renewable energy improvements for homes and businesses. Conduct targeted outreach to public entities, such as public schools, which are eligible for the California Energy Commission (CEC) Energy Conservation Assistance Act (ECAA) Program loans, which provide funding for energy efficiency and renewable energy projects.	Community Development, MVU	Phase 1-3	
Action BE-1g	Form strategic alliances with regional renewable energy providers, academic institutions, nonprofit organizations, and other municipalities to support the implementation of the renewable energy targets.	MVU	Phase 2-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure BE-2	**Decarbonize new residential construction by at least 95% by 2026.**	**Share (%) of new building permits for all-electric residential buildings**	**Source: Community Development**	• **California Energy Commission's Building Initiative for Low-Emissions Development (BUILD)** • **Affordable Housing and Sustainable Communities (AHSC) Program** • **California Electric Homes Program (CalEHP)**
Action BE-2a	Carry out a detailed study to identify the challenges and costs associated with decarbonizing new residential developments. The study shall include: 1. A comprehensive decarbonization plan for new residential buildings, with a focus on assessing the financial implications of electrification. 2. Evaluation of the potential impact of electrification on the cost and feasibility of multifamily and affordable housing projects, and develop strategies to mitigate negative impacts, promoting equitable access to sustainable housing.	Community Development, Building and Safety Division	Phase 1	
Action BE-2b	Adopt a single margin source energy score to decarbonize at least 95% of new residential construction by 2026. As part of decarbonization legislation development, incorporate the following: 1. Educate affordable housing developers on the cost-effectiveness of all-electric buildings and the future impact of stranded assets to encourage all-electric construction. 2. Establish a robust permitting compliance program to enforce the ordinance by streamlining the compliance process, training enforcement staff, and including regular inspections and penalties for non-compliance. Include major residential renovations under the single margin source energy score by 2026.	Planning Division, Building and Safety Division	Phase 1	
Action BE-2c	Lead targeted engagement efforts with residential developers to maximize the adoption of all-electric, energy-efficient designs in new housing projects. This engagement shall focus on hosting educational workshops for residential developers to provide them with the latest information on electrification, funding opportunities, and the benefits of constructing all-electric homes.	Community Development	Phase 1-2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-2d	Partner with key stakeholders involved in residential construction to facilitate the transition to decarbonized new homes. Develop comprehensive training programs in collaboration with local contractors, realtors, and homeowner associations. These programs shall cover the technical requirements and benefits of residential building decarbonization, provide education on the City's permitting compliance program (BE-2b) and offer guidance on avoiding service upgrade requirements through accurate load calculations.	Economic Development	Phase 1-2	
Action BE-2e	Promote the use of State and federal incentives specifically for residential developers, such as the California Energy Commission's (CEC) Building Initiative for Low-Emissions Development (BUILD), the Affordable Housing and Sustainable Communities (AHSC) Program, and the California Electric Homes Program (CalEHP). Continue to offer incentives (Density Bonus Program) for residential housing units built to green building standards, in line with the City of Moreno Valley 2021-2029 Housing Element Program 6-B.	Community Development	Phase 1-2	
Measure BE-3	**Decarbonize new nonresidential construction by at least 95% by 2026.**	**Share (%) of new building permits for all-electric nonresidential buildings**	**Source: Community Development**	• **California Energy Commission's Electric Program Investment Charge (EPIC)** • **Inflation Reduction Act** • **Infrastructure Investment and Jobs Act** • **Public-private partnerships** • **Property Assessed Clean Energy (PACE)**
Action BE-3a	Conduct a comprehensive feasibility study that assesses the practical and economic implications of decarbonizing new nonresidential buildings in Moreno Valley. This study shall: 1. Explore the economic impacts of decarbonization requirements on key sectors such as logistics, manufacturing, and retail, which are central to the Moreno Valley's economy. 2. Identify technological and operational challenges that businesses might face, offering solutions like incentives for early adoption of low-carbon technologies. 3. Investigate potential incentive structures to encourage businesses to exceed minimum requirements, such as tax breaks, expedited permitting, or grants for renewable energy systems. 4. Analyze the potential cost impacts on businesses, particularly small to medium-sized enterprises, and propose strategies to mitigate these impacts, promoting equitable decarbonization. 5. Include an analysis of the effectiveness of promoting and incentivizing solar installations, energy-efficient building operations systems, and the use of alternative-fueled equipment in achieving the Moreno Valley's decarbonization goals.	Planning Division, Building and Safety Division	Phase 1	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-3b	Adopt a single margin source energy score to decarbonize 95% of new nonresidential construction (i.e., commercial and industrial buildings including warehouses) by 2026. As part of decarbonization legislation development, incorporate the following: 1. Require developers of new nonresidential projects to submit infeasibility waivers if full electrification is not currently possible (due to technology constraints), enforcing a rigorous review process to validate these exemptions. 2. Mandate that any new nonresidential building deemed infeasible for full electrification must exceed Title 24 energy efficiency standards and be pre-wired and prepared for future electrification. 3. Incorporate flexibility in compliance paths, allowing businesses to choose cost-effective decarbonization strategies, such as investing in energy-efficient technologies or participating in Moreno Valley Electric Utility's (MVU) or Southern California Edison's (SCE) renewable energy programs. 4. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 5. Require regular review of and updates (at least every three years) to the ordinance to keep pace with technological advancements and market trends, so it supports both sustainability goals and economic development. Include nonresidential major renovations under the single margin source energy score by 2026.	Planning Division, Building and Safety Division	Phase 1	
Action BE-3c	Regularly monitor the implementation of the single margin source energy score to assess if it disproportionately affects small businesses. Engage with these community members to identify strategies to address any disproportionate effects identified and help them gain access to available electrification funding (identified in Action BE-3d) and MVU's GREEN MoVal programs. This shall include offering lower-interest financing options or rebates for businesses that might otherwise struggle to afford the upfront costs of electrification.	Community Development, MVU	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-3d	Identify and pursue funding opportunities to help developers and property owners offset the costs of decarbonizing new nonresidential buildings. Potential funding sources include: 1. Apply for grants through programs like the California Energy Commission's (CEC) Electric Program Investment Charge (EPIC) program, the Inflation Reduction Act, and the Infrastructure Investment and Jobs Act to support large-scale decarbonization projects. 2. Create a local fund to provide low-interest loans, rebates, or grants to businesses that invest in high-performance, low-carbon building technologies. 3. Encourage public-private partnerships that allow businesses to share the costs of decarbonization with government or non-governmental entities, such as through joint investments in renewable energy infrastructure with MVU or SCE and cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of clean fuels and technologies that lower or eliminate emissions. 4. Investigate the use of innovative financing models, such as Property Assessed Clean Energy (PACE) financing, to help businesses spread the costs of decarbonization over time. PACE programs allow a property owner to finance the up-front cost of energy or other eligible improvements on a property and then pay the costs back over time through a voluntary assessment. The unique characteristic of PACE assessments is that the assessment is attached to the property rather than to an individual.	Public Works, MVU, Grants Division	Phase 1-2	
Action BE-3e	Lead targeted engagement efforts with commercial developers and business stakeholders to promote the benefits of electrification and decarbonization. This shall include showcasing available incentives from the CEC and other programs, such as the Self-Generation Incentive Program (SGIP) and federal tax credits. Regularly collaborate with business associations and chambers of commerce to educate developers and property owners on the long-term economic benefits of building decarbonization, aligning these efforts with Moreno Valley's economic development goals.	Community Development, Economic Development	Phase 1-2	
Action BE-3f	Collaborate with local and regional stakeholders, including business associations, MVU, SCE, South Coast AQMD, and technology firms, to facilitate the decarbonization of nonresidential buildings and connect developers with funding (identified in Action BE-3d) for all-electric new nonresidential construction. Additionally, collaborate with local economic development agencies to align decarbonization efforts with broader business attraction and retention strategies and to position Moreno Valley as a leader in sustainable business practices.	Community Development, Economic Development	Phase 1-2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure BE-4	**Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% by 2030 and 31% by 2045.**	**Change (%) in residential natural gas consumption and share (%) of residential building permits for electric appliances**	**Sources: GHG Inventories and Community Development**	• **California Air Resources Board** • **Inflation Reduction Act** • **Infrastructure Investment and Jobs Act** • **Block grants** • **Green bonds**
Action BE-4a	Assess the feasibility and cost implications of retrofitting existing residential buildings for electrification. This study shall: 1. Determine the hurdles that residents living on low incomes may face with household electrification. Develop cost-saving strategies and potential funding solutions to address equity hurdles. 2. Assess the existing housing stock in Moreno Valley and the potential need for electrical panel upgrades due to electrification, including the need when paired with smart panels. 3. Outline the necessary funding and financing mechanisms to support the community in achieving the decarbonization goals.	Planning Division, Building and Safety Division	Phase 1	
Action BE-4b	Develop and adopt a reach code requiring all new residential central air conditioning unit installations and replacements be two-way, providing both heating and cooling with a single unit for residential buildings by 2026. Include the following aspects in the code development: 1. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 2. Monitor the effectiveness of the reach code through the permitting compliance program and revise the reach code during each update cycle as needed to meet the decarbonization goal.	Planning Division, Building and Safety Division	Phase 1	
Action BE-4c	Continue providing GREEN MoVal programs to Moreno Valley Electric Utility (MVU) customers and technical assistance for residential building retrofits. Expand the programs to focus incentives and technical assistance on panel upgrades, heat pump water heater replacements, and heat pump heating, ventilation, and air conditioning (HVAC) installations to support existing residential building electrification.	Public Works, MVU	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-4d	Streamline permitting processes for the installation of smart panels and other technologies that support electrical demand management in residential buildings to enforce Senate Bill (SB) 379 (2022)'s requirements. This action shall: 1. Simplify the permitting requirements for smart panels and demand management technologies to accelerate adoption in residential properties in alignment with SB 379 (2022)'s requirements. This should include an online, automated permitting platform, easy-to-understand compliance checklists, and expedited permitting for these technologies. 2. Evaluate the opportunity to waive permit fees for projects that include smart panels and similar technologies that contribute to efficient electrical demand management and energy savings. 3. Collaborate with relevant City departments to implement the updated permitting procedures effectively and review them regularly to accommodate emerging demand management technologies. 4. Promote the streamlined process to homeowners and contractors, emphasizing the benefits of smart panels for managing electricity costs during electrification efforts.	Building and Safety Division	Phase 1	
Action BE-4e	Collaborate with local unions, industrial groups, and Moreno Valley College to create training programs focused on the installation and retrofit of electric appliances in residential buildings. This program shall: 1. Help develop training or apprenticeships that prepare the local workforce for green jobs in electrification. 2. Work closely with industry partners to align training with current and future market demands.	Economic Development	Phase 1-2	
Action BE-4f	Continue engagement with Southern California Edison (SCE) to help them implement residential efficiency and electrification programs (modeled after MVU's GREEN MoVal programs including the Residential Energy Audit & Direct Install Program) for customers in Moreno Valley.	MVU, Public Works	Phase 1-2	
Action BE-4g	Continue to educate MVU residents on MVU's GREEN MoVal programs to support and fund existing building electrification; and SCE residents on SCE's Charge Ready Home program for electrical panel upgrades. Additionally, work with SCE to encourage enrollment in SCE's Demand Response programs for to help residents mitigate electricity bill cost increases from electrification.	MVU, Public Works	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-4h	Identify and secure funding through various sources, including California Air Resources Board (CARB), the Inflation Reduction Act, and the Infrastructure Investment and Jobs Act to fund MVU's GREEN MoVal program expansion and provide residents with existing building electrification incentives. Additional funding options may include U.S. Department of Energy (DOE) block grants, community development block grants, green bonds, grant anticipation notes or short-term loans, tax-exempt lease purchases, energy as a service, and energy performance contracting from energy service companies.	Grants Division, City Manager's Office, MVU	Phase 1-2	
Action BE-4i	Collaborate with affordable housing owners, utilities, and community organizations to fund and implement a pilot project aimed at electrifying existing low-income housing. Work with MVU to develop a program that offsets the cost of electrification through on-bill financing and by sourcing grant funds. Engage with community groups to address the specific needs of residents living on low incomes in the pilot project.	Planning Division, Economic Development	Phase 1-2	
Measure BE-5	**Decarbonize existing nonresidential buildings to reduce existing nonresidential natural gas consumption by 3.8% by 2030 and 18% by 2045.**	**Change (%) in nonresidential natural gas consumption and share (%) of nonresidential building permits for electric appliances**	**Sources: GHG Inventories and Community Development**	• **California Air Resources Board** • **Inflation Reduction Act** • **Infrastructure Investment and Jobs Act** • **Block grants** • **Green bonds**
Action BE-5a	Initiate a comprehensive feasibility study to identify barriers to electrifying existing nonresidential buildings across various industries in Moreno Valley. This study shall include an analysis of the cost range for retrofitting different types of nonresidential buildings, considering the unique challenges faced by warehouses, manufacturing facilities, and other large-scale operations prevalent in Moreno Valley. The study shall also assess the appropriate project threshold for requiring electric upgrades to achieve the goal of decarbonizing 3.8% of existing nonresidential buildings by 2030.	Planning Division, MVU	Phase 1	
Action BE-5b	Develop and adopt a reach code requiring all new nonresidential central air conditioning unit installations and replacements be two-way, providing both heating and cooling with a single unit for nonresidential buildings by 2026. Include the following aspects in the code development: 1. Enforce the ordinance through the same permitting compliance program developed under Action BE-2b. 2. Monitor the effectiveness of the reach code through the permitting compliance program and revise the reach code during each update cycle as needed to meet the decarbonization goal.	Building and Safety Division, Planning Division	Phase 1	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-5c	Continue providing GREEN MoVal programs to Moreno Valley Electric Utility (MVU) customers to provide funding and technical assistance for nonresidential building retrofits. Expand the programs to focus incentives and technical assistance on panel upgrades, heat pump water heater replacements, and heat pump HVAC installations to support existing nonresidential building electrification. Additionally, scale up the programs' incentives to cover a larger portion of nonresidential building retrofit costs.	Community Development, MVU	Phase 1-3	
Action BE-5d	Facilitate access to funding and incentives for nonresidential building owners aiming to electrify and businesses aiming to decarbonize their operations. This includes pursuing the funding options identified in Action BE-4h.	Community Development, Grants Division	Phase 1-2	
Action BE-5e	Launch an outreach campaign to promote existing nonresidential building decarbonization. This campaign shall include: 1. Targeted outreach to businesses, contractors, property managers, and building owners highlighting the benefits of, available funding for, and available technical assistance for existing nonresidential building electrification. Tailor the information specifically for the commercial and industrial sectors in Moreno Valley including warehouses. Outreach may include workshops/webinars and informational brochures including MVU bill inserts. 2. Promoting MVU's Energy Load Program to help customers manage their energy profile to reduce electricity bill cost increases with electrification. 3. Encouraging enrollment in Southern California Edison (SCE)'s Demand Response programs for businesses as well as the installation and use of smart panels and building management systems to manage electricity costs during electrification. 4. Maintaining an updated webpage on the City's website to promote the above information and available energy benchmarking tools like the ENERGY STAR Portfolio Manager to help nonresidential building owners (>50,000 square feet) comply with the California Energy Commission's Building Energy Benchmarking Program. 5. Highlighting opportunities for nonresidential carbon capture technology retrofits, showcasing potential co-benefits.	Community Development, Economic Development, MVU	Phase 1-2	
Action BE-5f	Regularly monitor the implementation of the two-way air conditioning reach code (Action BE-5b) to assess if it disproportionately affects small businesses and low-income nonresidential property owners. Engage with these community members to identify strategies to address any disproportionate effects identified and help them gain access to available electrification funding (identified in Action BE-4h) and MVU's GREEN MoVal programs. This shall include offering lower-interest financing options or rebates for businesses that might otherwise struggle to afford the upfront costs of electrification.	Economic Development, Building and Safety Division, Planning Division	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-5g	Collaborate with regional business associations, local chambers of commerce, and industrial leaders to establish a coalition focused on decarbonizing nonresidential buildings. This coalition shall work closely with MVU and partner with SCE to help tailor energy solutions (in MVU's GREEN MoVal programs) and education campaigns (Action BE-5e's education campaign) that meet the specific needs of different industries within Moreno Valley. The coalition shall also support the City's efforts to pursue funding for existing nonresidential building electrification (including those in Action BE-4h).	Community Development, Economic Development	Phase 1	
Measure BE-6	**Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.**	**Solar and battery capacity added (Megawatts)**	**Source: Community Development and MVU**	• **U.S. Department of Energy's Long-Duration Energy Storage (LDES) Pilot Program** • **California Climate Investments for LDES in disadvantaged communities** • **Green bonds** • **Public-private partnerships**
Action BE-6a	Streamline permitting processes for solar installations to accelerate the deployment of renewable energy generation and storage systems in residential buildings to enforce Senate Bill (SB) 379 (2022)'s requirements. This action shall: 1. Simplify the permitting requirements for solar and energy storage installations to accelerate adoption in residential properties in alignment with SB 379 (2022)'s requirements. This should include an online, automated permitting platform, easy-to-understand compliance checklists, and expediated permitting for these technologies. 2. Evaluate the opportunity to waive permit fees for the installations that permit requirements. 3. Coordinate with relevant City departments to implement the updated permitting procedures effectively and review them regularly to accommodate emerging solar and storage technologies. 4. Promote this streamlined process through outreach to businesses and property owners to increase awareness and participation.	Building and Safety Division, Planning Division	Phase 2	
Action BE-6b	Conduct a feasibility study by 2027 to identify factors including capacity needs, costs, site suitability, and technology options for Moreno Valley Electric Utility (MVU) to install utility-scale energy storage infrastructure to support Measure BE-1's renewable energy goals. Based on the feasibility study's results, develop a plan to implement the utility-scale renewable energy storage projects.	MVU, Public Works	Phase 2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-6c	Evaluate the adoption of an ordinance requiring a certain percentage of roof area on new and majorly renovated nonresidential buildings be dedicated to solar photovoltaic (PV) systems paired with energy storage. The ordinance shall: 1. Establish a mandatory solar coverage percentage (e.g., at least 50% of usable roof space) for qualifying buildings, with flexibility for property owners to either install the systems themselves or lease the space to MVU or Southern California Edison (SCE) for renewable energy production. 2. Require the inclusion of battery storage systems alongside PV installations, to enhance energy resilience and support grid stability. 3. Provide incentives such as expedited permitting or fee reduction for projects that exceed the minimum solar and storage requirements or integrate innovative renewable energy solutions like microgrids.	Planning Division, Building and Safety Division	Phase 2	
Action BE-6d	Partner with MVU and SCE to develop an education campaign to inform residential property owners and perform targeted outreach to large nonresidential property owners about the benefits of and available incentives for local renewable energy generation and storage. This campaign shall: 1. Provide detailed information on available incentives, rebates, and tax credits for installing solar PV and battery storage systems on homes and businesses, including the Self-Generation Incentive Program (SGIP), Solar on Multifamily Affordable Housing (SOMAH), and federal tax credits. 2. Highlight case studies and testimonials from businesses that have successfully implemented solar and storage solutions, including those that have used onsite solar installation as a way to comply with South Coast Air Quality Management District's (AQMD) Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. 3. Create educational materials and host workshops on topics such as energy resilience, microgrids, and the financial benefits of renewable energy. 4. Organize events that connect nonresidential property owners with solar developers, financial institutions, and MVU representatives to explore partnership opportunities.	Community Development	Phase 2-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action BE-6e	Through Action BE-5g's coalition, support the development and implementation of renewable energy and storage projects. Key activities include: 1. Collaborating with local unions and educational institutions to provide training programs focused on the installation and maintenance of commercial solar and storage systems. 2. Exploring opportunities for shared renewable energy projects, such as community solar and energy storage or microgrids, that can be implemented on or near large commercial and industrial properties. Review opportunities to lease roof space for solar PV installations or the solar PVs to MVU. 3. Investigating opportunities for co-located energy generation facilities, where excess heat or power from industrial processes could be harnessed for additional renewable energy production.	Economic Development	Phase 2-3	
Action BE-6f	Pursue State and federal funding (such as the U.S. Department of Energy's Long-Duration Energy Storage (LDES) Pilot Program or the State's California Climate Investments for LDES in disadvantaged communities) to implement Action BE-6b's utility-scale energy storage plan for MVU. Additionally, explore the issuance of green bonds or other financing mechanisms to fund MVU's utility-scale solar and storage projects. Pursue opportunities to partner with financial institutions that offer favorable terms for sustainable energy projects.	Grants Division, Public Works, MVU	Phase 2-3	
Action BE-6g	Include direct outreach to building owners of residents living on low incomes and small businesses in Action BE-6d's education campaign to connect them with available incentives for renewable energy generation and storage.	Community Development	Phase 2-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure T-1	**Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.**	**Active transportation mode share (%)**	**Source: US Census Bureau[66]**	• **Active Transportation Program** • **Sustainable Transportation Equity Project (STEP)** • **Caltrans Sustainable Transportation Planning Grants**
Action T-1a	Conduct a comprehensive update of Moreno Valley's Bicycle Master Plan to assess and address current quality and connectivity conditions and gaps in the active transportation network, in line with Circulation Element Goal C-1, which emphasizes providing a well-connected, multimodal transportation system. The update shall: 1. Identify new areas and existing roadways to convert high stress streets to low stress bikeways with the goal of doubling Moreno Valley's Bicycle Network Analysis (BNA) score (or similar bicycle network scoring criteria) by 2030. The identification shall include converting at least 20 miles of high stress streets to low stress bikeways by 2030. 2. Prioritize projects such as the proposed bike lane extensions along Perris Boulevard and the creation of people-only pathways linking residential areas with key destinations like the Moreno Valley Mall, schools, and parks. 3. Prioritize "Safe Routes" initiatives, focusing on enhancing pedestrian and bicycle access to schools and employment centers. This shall include improvements to intersections, crosswalks, and signage around schools and major employment hubs, creating safer routes for students and workers. 4. Evaluate existing bicycle parking and recommend a policy or ordinance to require or encourage the installation of visible bicycle parking infrastructure in certain types of new construction.	Transportation Engineering Division	Phase 1	
Action T-1b	Update and implement the Bicycle Master Plan to double Moreno Valley's BNA score (or similar bicycle network scoring criteria) and convert at least 20 miles of high stress streets to safe bikeways throughout Moreno Valley by 2030 and implement City policies that align with Moreno Valley's 2040 General Plan Circulation Element to provide a safe and well-connected multi-modal system. This implementation shall include the development of Complete Streets, emphasized in Policy C.2-1, promoting the design of streets that are safe for all users, including pedestrians, bicyclists, and public transit riders.	Transportation Engineering Division	Phase 2	

66. U.S. Census Bureau. American Community Survey (ACS) 5-Year Estimates Subject Tables: S0801|Commuting Characteristics by Sex. Available at: ***https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270***

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-1c	Pursue the following partnerships and fees to fund the implementation of the updated Bicycle Master Plan's active transportation projects: 1. Collaborate with Riverside County Transportation Commission (RCTC), Western Riverside Council of Governments (WRCOG), Caltrans, and other relevant agencies to identify and secure funding to implement the updated Bicycle Master Plan's active transportation projects. Pursue grants such as the Active Transportation Program, Sustainable Transportation Equity Project (STEP), and Caltrans Sustainable Transportation Planning Grants. 2. Engage local businesses and developers to create Business Improvement Districts to drive investment in active transportation infrastructure, such as the construction of bike lanes or pedestrian-friendly zones in commercial areas. 3. Leverage Development Impact Fees (DIFs) as outlined in Policy C3-6 of the Circulation Element to fund transportation improvements that enhance connectivity between residential neighborhoods and employment centers, such as the proposed enhancements along major corridors like Alessandro Boulevard and Moreno Beach Drive.	Transportation Engineering Division, Grants Division	Phase 1-2	
Action T-1d	Partner with Moreno Valley Unified School District, Val Verde Unified School District, and Moreno Valley College to promote active transportation. Conduct events like "Bike to School" or "Walk to Work" days, supported by the Circulation Element's Goal C-4, which advocates for increasing non-motorized transportation modes. Engage these institutions in implementing safety measures, such as enhanced crosswalks and bike racks, particularly at schools and college campuses.	Transportation Engineering Division, Parks and Community Services	Phase 2	
Action T-1e	Work with Caltrans to incorporate active transportation infrastructure, such as bike lanes and pedestrian bridges, into State highway improvement projects within Moreno Valley, including planned improvements along State Route 60. This aligns with Action C.4-C, which focuses on coordinating with State and regional agencies to improve transportation facilities and services.	Transportation Engineering Division	Phase 2-3	

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<tr><th>Measure/ Action ID</th><th>Measure/Action</th><th>Key Performance Indicator/ Responsible City Department(s)</th><th>Key Performance Indicator Source/ Implementation Timeframe</th><th>Identified Funding Sources</th></tr>
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<tr><td>Action T-1f</td><td>Develop an educational campaign to promote the benefits of active transportation and available rebates. The campaign shall include:
1. The creation of a user-friendly webpage or app that provides real-time information on Moreno Valley's active transportation options, including bike lanes, trails, and transit routes.
2. Showcasing projects like the planned pedestrian bridge over the Perris Valley Storm Drain, which will connect key parts of Moreno Valley.
3. Hosting community events, such as "Open Streets" days, where sections of Moreno Valley are temporarily closed to vehicular traffic to encourage non-motorized transportation modes, such as walking and biking.
4. Informing community members on the availability of rebates for electric bicycles through CARB and Pedal Ahead's California E-Bike Incentive Project.</td><td>Transportation Engineering Division, Parks and Community Services</td><td>Phase 1-3</td><td></td></tr>
<tr><td>Action T-1g</td><td>Prioritize the development of active transportation projects through the Bicycle Master Plan update in Moreno Valley's disadvantaged communities, consistent with Goal C-1 of the Circulation Element, which emphasizes the importance of equitable access to transportation facilities. Additionally, focus on projects in neighborhoods with limited pedestrian and bicycle infrastructure, such as those in the eastern and southern parts of Moreno Valley, where connectivity improvements are most needed.</td><td>Transportation Engineering Division</td><td>Phase 2</td><td></td></tr>
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Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure T-2	**Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.**	**Public transit mode share (%)**	**Source: US Census Bureau[67]**	• **Subsidized transit programs** • **Low Carbon Transit Operations Program (LCTOP)**
Action T-2a	Work with Riverside Transit Agency (RTA) to identify public and multi-modal transportation (including micro-transit services which are flexible, on-demand transportation services like shuttle services) opportunities in Moreno Valley, as aligned with Moreno Valley's Circulation Element Goal C-2. The identification shall involve assessing current public transit routes, schedules, and infrastructure in Moreno Valley; and identifying gaps in service and areas for improvement. Identified opportunities shall: 1. Prioritize enhancing connections between residential neighborhoods and key employment centers like the Moreno Valley Business Park, the planned World Logistics Center, the Moreno Valley Mall, and the Riverside University Health System Medical Center. 2. Identify infrastructure improvements for safety and comfort including installing seating, shading, and lighting at bus stops, particularly in neighborhoods that currently lack adequate transit facilities. 3. Work with RTA to improve first- and last-mile access to major transit hubs, such as the Moreno Valley/March Field Metrolink Station, through connections to active transportation networks and micro-transit services.	Community Development, Public Works	Phase 1-2	
Action T-2b	Conduct annual average vehicle ridership (AVR) surveys of Moreno Valley's businesses to measure weekday AVR and mode split among commuters. The survey shall also identify perceived barriers to sustainable commuting options (such as carpooling, public transportation, biking, and telecommuting) and assess interest in transportation-related infrastructure improvements and resources aimed at increasing participation in alternative transportation modes.	Public Works	Phase 1-3	
Action T-2c	Analyze and revise parking policies to support increased public transportation use, as outlined in Goal C-5 of the Circulation Element, which encourages the integration of land use and transportation planning. Enforce Assembly Bill (AB) 2097 (2022)'s requirements for buildings near High Quality Transit Stops to eliminate or reduce parking minimums and implement parking maximums to discourage excessive vehicle use.	Community Development, Public Works	Phase 1	

67. U.S. Census Bureau. American Community Survey (ACS) 5-Year Estimates Subject Tables: S0801|Commuting Characteristics by Sex. Available at: ***https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270***

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-2d	Work closely with RTA to implement the public and multi-modal transportation opportunities identified in Moreno Valley (through Action T-2a) and improvements to bus routes in Moreno Valley outlined in RTA's Short Range Transit Plan. Implementation shall be done in line with Goal C-5 of the Circulation Element, which emphasizes enhancing transportation options to reduce vehicle trips.	Community Development, Public Works	Phase 1-2	
Action T-2e	Focus Action T-2a's efforts on making public and multi-modal transportation more accessible and comfortable in disadvantaged community census tracts, consistent with Goal C-2 of the Circulation Element, which advocates for equitable transportation access. Include direct outreach to community members living on low incomes, seniors, and students to identify opportunities to improve accessibility.	Public Works, Community Development	Phase 1-2	
Action T-2f	Cross-promote RTA's public transit and multi-modal transportation options on the City's website and at Moreno Valley community events (e.g., the Moreno Valley Regional Job Fair, Farmers Markets, and Earth Day Celebration) and community centers (e.g., the Moreno Valley Senior Center, Moreno Valley Business and Employment Resource Center, and City Library). Include promotion of: 1. The environmental benefits of public transit and multi-modal transportation uses, including vehicle miles traveled (VMT) reduction. 2. Available RTA bus routes in Moreno Valley, including up-to-date routes and schedules, scheduled improvements/expansions, and RTA's GoMobile App to purchase passes, plan trips, and track buses. 3. RTA's subsidized transit programs including summer fare discounts (i.e., 25-cent fares from June 1 to August 31) and reduced fare offerings (e.g., seniors and disabled; veterans; active military, police, and fire personnel; jury duty; youth; and children).	Public Works, Media and Communications Division, Community Development	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-2g	Work with RTA and other regional partners continue offering subsidized transit programs (i.e., free or discounted bus passes) for seniors and students (i.e., Go-Pass/U-Pass) and to develop subsidized transit programs for residents living on low incomes or in disadvantaged communities, as aligned with Goal C-2 of the Circulation Element. Additionally, seek funding opportunities through State and federal grants, such as the Low Carbon Transit Operations Program (LCTOP), to support these initiatives.	Public Works, Community Development, Grants Division	Phase 1-3	
Measure T-3	**Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce commuter vehicle miles traveled.**	**Work from home rate (%)**	**Source: US Census Bureau[68]**	• **Hire MoVal incentives** • **Stipends, license discounts**
Action T-3a	Complete the development of the broadband internet service plan to expand access to robust broadband internet service in the community and increase opportunities for residents to work from home. The plan shall include: 1. An inventory of existing systems and service availability to understand the current broadband internet service environment. 2. Community outreach, including an online broadband internet service survey and workshops to engage stakeholders about their needs. Outreach shall include engagement to understand hurdles and identify solutions for community members to work from home as well as partnership with community-based organizations such as RIVCOconnect to understand hurdles and solutions for equitable access to broadband internet service in the community. 3. A high-level network design that leverages existing assets and supports the needs of the City and the community that will use the network. 4. A financial and cost/benefit analysis to identify the business and financial sustainability of the program.	Planning Division	Phase 1	
Action T-3b	Continue to maintain a list of recommended Transportation Demand Management strategies for employers and new development to adopt in accordance with Action C.5-B of the Circulation Element. Include in the list strategies that prove businesses accommodate and encourage employees to work from home (e.g., hybrid and alternate work schedules) and use public transit (e.g., flexible schedules that accommodate public transit delays).	Transportation Engineering Division	Phase 1-3	
Action T-3c	Continue to offer Hire MoVal incentives to businesses to encourage businesses to employ Moreno Valley residents to reduce VMT. Monitor the use of the incentives and expand the program to incorporate resources and incentives (e.g., stipends, license discounts) for businesses that maintain remote work policies for employees.	Economic Development	Phase 1-3	

68. U.S. Census Bureau. American Community Survey (ACS) 5-Year Estimates Subject Tables: S0801|Commuting Characteristics by Sex. Available at: ***https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270***

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-3d	Develop an educational campaign to promote the benefits of remote work and available resources. The campaign shall highlight cost savings, work-life balance improvements, and environmental benefits of reduced VMT as well as strategies to help employees maintain productivity, collaboration, and energy-efficiency in home offices.	Economic Development, Community Development	Phase 1-3	
Action T-3e	Partner with RIVCOconnect to improve broadband connectivity and high-speed internet access to disadvantaged communities in Moreno Valley. Directly connect residents living on low incomes to their services and Riverside County's Tech on Wheels program.	City Manager's Office	Phase 1-2	
Measure T-4	**Achieve zero-emission vehicle adoption rates of 35% for passenger vehicles and 20% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.**	**ZEV share (%) of passenger and commercial vehicles and publicly accessible chargers installed (#)**	**Sources: GHG Inventories or California Department of Motor Vehicles[69] and Public Works Department**	• **Low Carbon Fuel Standard's credits**
Action T-4a	Identify and engage with commercial vehicle fleets in Moreno Valley to identify opportunities for and hurdles to decarbonization. This effort shall: 1. Identify commercial vehicle fleets, including those belonging to small businesses, those subject to the California Air Resources Board's (CARB) Advanced Clean Fleets Regulation, and those with significant decarbonization potential, to focus Action T-4d's outreach campaign on. 2. Engage with commercial vehicle fleets to understand hurdles to decarbonization including gaps in Moreno Valley's charging and refueling network. 3. Engage Moreno Valley Electric Utility (MVU) with commercial vehicle fleets to identify electric infrastructure and capacity hurdles to fleet decarbonization and opportunities to address them. 4. Explore opportunities to support businesses in developing cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of commercial zero emission vehicles (ZEV).	Public Works, MVU, Fleet and Facilities Maintenance Division, Maintenance and Operations Division	Phase 1	

69. CARB and the CEC summarize and publish vehicle registration data by fuel technology type (e.g., battery electric, fuel cell, gasoline) from the California Department of Motor Vehicles.

California Air Resources Board (CARB). EMFAC: Fleet Database. Available at: ***https://arb.ca.gov/emfac/fleet-db/214ee9d70a02c2aec4c7ac68c47b9d6c2eec357c***

California Energy Commission (CEC). Light-Duty Vehicle Population in California. Available at: ***https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics-collection/light***

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-4b	Develop and adopt an electric vehicle (EV) reach code by 2026 requiring new multifamily and commercial construction install the minimum number of EV chargers based on CalGreen Tier 2 requirements. Incorporate the Moreno Valley EV Charging Infrastructure Master Plan's recommendations for charger density and location into the reach code requirements.	Planning Division, Transportation Engineering Division	Phase 1	
Action T-4c	Through public-private partnerships, install 961 new publicly accessible chargers by 2030 and 7,376 by 2045. Prioritize installation locations and charger types (i.e., Level 2 and direct current fast charging [DCFC]) based on guidance from the Moreno Valley EV Charging Infrastructure Master Plan (including the equity analysis) and leverage partnerships identified in the Master Plan to fund, operate, and maintain the installations.	Transportation Engineering Division, MVU	Phase 1-3	
Action T-4d	Launch a public outreach campaign to inform residents and commercial vehicle fleet owners about the benefits of ZEVs (including environmental, health, and economic advantages) and the available incentives for ZEVs. This campaign shall: 1. Continue to promote MVU's 555 EV Program for residential customers and MVU's Clean EV Program for commercial customers. 2. Promote the availability of Southern California Edison (SCE)'s Charge Ready program, Pre-Owned EV Rebates, and Clean Vehicle Rebate Project to residents and businesses. 3. Promote the availability of CARB's Clean Truck and Bus Vouchers (HVIP) and Cal Fleet Advisors' fleet electrification concierge service to businesses and commercial vehicle fleet owners subject to the Advanced Clean Fleets Regulation (identified in Action T-4a). 4. Highlight case studies and testimonials from businesses that have successfully adopted ZEVs, including those that have used ZEV purchases, ZEV truck visits, and ZEV charging/fueling infrastructure as a way to comply with South Coast AQMD's Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. 5. Host webinars and informational sessions connecting the commercial vehicle fleets with significant decarbonization potential (identified in Action T-4a) with the Low Carbon Fuel Standard's infrastructure, fueling, and solar (i.e., low carbon intensity electricity) credits for ZEV charging and fueling to accelerate commercial ZEV adoption. Likewise, connect businesses to the Low Carbon Fuel Standard's workplace EV charging credits to support passenger ZEV adoption. 6. Perform direct outreach to the small businesses with commercial vehicle fleets (identified in Action T-4a) to connect them with incentives for smaller fleets such as the California Capital Access Program's Zero-Emission Heavy-Duty Programs.	Community Development, MVU	Phase 1-2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-4e	Collaborate with local unions, industrial groups, and Moreno Valley College to create training programs focused on the installation and maintenance of ZEVs and ZEV charging/fueling infrastructure. This program shall: 1. Offer comprehensive training or apprenticeships that prepare the local workforce for green jobs in vehicle electrification such as ZEV mechanics and ZEV charging and fueling technicians. 2. Work closely with industry partners to align training with current and future market demands.	Economic Development	Phase 1-2	
Action T-4f	Work with Western Riverside Council of Governments (WRCOG) to implement the Western Riverside County Municipal Green Zones Pilot Project to deploy zero emission car-share vehicles in Moreno Valley. Monitor the implementation of the pilot project and use the results to pursue partnerships with private ZEV car-share providers (e.g., ZipCar) to bring more ZEV car-share vehicles to Moreno Valley to provide ZEV access to all residents and improve mobility options in the community.	Public Works, Transportation Engineering Division	Phase 1	
Action T-4g	Pursue funding to support Action T-4c's publicly accessible EV chargers including Low Carbon Fuel Standard's credits for public EV charging. Additionally, align the expansion scale-up of MVU's GREEN MoVal programs (Action BE-5c) with panel upgrades needed to support EV charging infrastructure.	Grants Division	Phase 1-2	
Measure T-5	**Implement programs to support California Air Resources Board and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.**	**Rebates issued (#) or equipment replaced through Off-road Equipment Replacement Program (#)**	**Sources: South Coast AQMD, Community Development, and Public Works**	
Action T-5a	Develop a phased ordinance by 2027 to ban the local operation of gasoline and diesel-powered off-road equipment by type. To align with CARB regulations, the ordinance shall enforce the use of R99 and R100 renewable diesel per California Air Resources Board's (CARB) Off-Road Diesel-Fueled Fleets Regulation requirements and enforce the sale of new zero-emission small off-road engines (SORE) per CARB's SORE regulations.	Planning Division, Public Works	Phase 1-2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action T-5b	Identify and engage with off-road equipment and vehicle fleets in Moreno Valley to identify opportunities for and hurdles to decarbonization. This effort shall: 1. Identify off-road vehicle and equipment fleets, including those belonging to small businesses and those with significant decarbonization potential, to focus Action T-5d's outreach campaign on. 2. Inventory the current off-road equipment and vehicle types used in Moreno Valley and identify available electric or biofuel alternatives available for each equipment type. 3. Explore opportunities to support businesses in developing cooperative partnerships with South Coast Air Quality Management District (AQMD) to cosponsor projects demonstrating the successful use of zero-emission off-road equipment and vehicles.	Public Works	Phase 1	
Action T-5c	Collaborate with South Coast AQMD to review existing off-road equipment replacement rebate programs for procedural equity and connect small businesses (identified in Action T-5b), as well as residents living on low incomes, to these rebates. This shall include offering grant application support to these small businesses.	Public Works	Phase 1-2	
Action T-5d	Launch a public outreach campaign to inform contractors, residents, and off-road fleet owners in Moreno Valley about the health and safety benefits of transitioning to zero-emission off-road equipment and vehicles, and funding opportunities. The campaign shall: 1. Work with South Coast AQMD to promote the availability of off-road rebates under their Residential and Commercial Electric Lawn and Garden Equipment Rebate Programs and Carl Moyer Program. Additionally, promote the availability of CARB's Clean Off-Road Equipment Voucher Incentive Program. 2. Highlight case studies and testimonials from businesses that have successfully adopted zero-emission off-road equipment and vehicles, including those that have used zero-emission yard trucks as a way to comply with South Coast AQMD's Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. 3. Host webinars and informational sessions connecting the off-road fleet owners with significant decarbonization potential (identified in Action T-5b) with the Low Carbon Fuel Standard's credits for off-road transportation.	Public Works, Media and Communications Division	Phase 1-3	
Action T-5e	Collaborate with neighboring jurisdictions and South Coast AQMD to establish an Off-road Equipment Replacement Program. This program will provide free consultations to fleet operators identified in the feasibility study, helping them transition to zero-emission equipment. The program shall also offer support for accessing rebates and incentives and connect operators with local repair services capable of maintaining the new equipment.	Public Works	Phase 2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Measure SW-1	**Achieve, monitor, and maintain Senate Bill 1383 (2016) requirements to reduce waste sent to landfills by 75% below 2014 levels by 2030.**	**Change (%) in landfilled organic waste**	**Sources: Waste Management audits and GHG Inventories**	• **CalReycle Organics Grant Program** • **California Climate Investments**
Action SW-1a	Partner with Waste Management to conduct annual community waste characterization studies to determine organic waste landfill and diversion rates and track community progress on Senate Bill (SB) 1383 (2016) compliance. Use findings to inform policies and programs aimed at increasing organic waste diversion rates and reducing contamination.	Purchasing and Sustainability Division	Phase 1-3	
Action SW-1b	Review the City's existing waste hauler franchise agreement(s) with Waste Management and amend as needed to include SB 1383 (2016) organic waste diversion compliance. Include a new SB 1383 (2016) fee to provide a sustainable revenue source for a new full- or part-time City staff person to manage organic waste diversion programs. The agreement shall include: 1. Implementation of contamination checks on routes to identify compost and recycling contamination and issue fees for incorrectly sorted materials with sensitivity to shared collection. Earmark the fee revenues to fund to the new City staff position and implementation City programs to increase communitywide organic waste diversion. 2. Quarterly meetings between Waste Management and the City to review progress reports, the annual waste characterization results (Action SW-1a), and establish prioritized actions, as needed, for Waste Management to implement to improve SB 1383 (2016) compliance. 3. Adding organics collection and recycling bins and service to public areas, where needed. Public areas shall include a community compost hub at the Moreno Valley Community Demonstration Garden to increase communitywide access to composting services. 4. Free food scrap collection pail distribution to single-family and multi-family residences. 5. Distribution of informational material to Waste Management customers to educate community members on the availability of curbside composting services and proper disposal methods to reduce contamination. 6. Establishing composting and recycling services for special events such as Fun Color Run, El Grito, MoVal Movies, MoVal Rocks!, Springtastic, Multicultural & Art Festival, Farmers Market, etc.	Public Works	Phase 1	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action SW-1c	Work with the Riverside County Department of Waste Resources to educate Moreno Valley community members on organic waste diversion and recycling. Education efforts shall include: 1. Creation of multi-lingual training/education material to educate residents and businesses on the availability of curbside composting, benefits of organic waste diversion, and proper disposal methods. 2. Promotion of the Riverside County Department of Waste Resources' free classes on backyard composting, food waste, zero waste, and more. 3. Access to these resources the City's website.	Purchasing and Sustainability Division	Phase 1-3	
Action SW-1d	Partner with the Riverside County Department of Waste Resources to continue offering school resources (i.e., free worm bin kits, free composting bins, composting program mentors and volunteers, landfill tours, and speakers on waste reduction and sustainability) to Moreno Valley Unified School District (MVUSD) and Val Verde Unified School District to educate students on the importance of composting and waste diversion as well as proper disposal methods.	Purchasing and Sustainability Division	Phase 1-3	
Action SW-1e	Partner with the Western Riverside Council of Governments' (WRCOG) Regional Food Rescue Program to identify commercial food generators in Moreno Valley and directly connect them with the Regional Food Rescue Program's Food Recovery Network, CAREIT Food Recovery App, and 1-on-1 program training as well as the City's Food Recovery Program. Efforts shall support compliance with SB 1383 (2016) to recover at least 20% of edible food currently disposed of.	Public Works	Phase 1-3	
Action SW-1f	Continue offering the Multifamily Recycling Program Support (i.e., site visits and waste reduction consultations, presentations at tenant associations and community room events, information for tenant newsletters, emails, and packets, and assistance promoting reuse and waste prevention) to increase organic waste diversion in rental and multi-family housing. Evaluate expanding the program to connect participants with Waste Management to receive free food scrap collection pails. Monitor the program's participation rates and update the program as needed to optimize organic waste diversion.	Purchasing and Sustainability Division	Phase 1-3	
Action SW-1g	Pursue funding opportunities through State programs like the California's Department of Resources Recycling and Recovery's (CalRecycle) Organics Grant Program or California Climate Investments to support the expansion of organic waste diversion programs and the implementation of SB 1383 (2016) requirements in Moreno Valley.	Public Works, Grants Division	Phase 1-2	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action SW-1h	Continue to work with WRCOG's Solid Waste Cooperative to regionally address the SB 1383 (2016) organic waste diversion goals. Work with the cooperative to pursue Action SW-1h's funding opportunities. Additionally, include attendance of WRCOG's quarterly Solid Waste Committee meeting and preparation of quarterly reports on Moreno Valley's organic waste diversion progress (to be presented at the quarterly committee meetings and submitted by the committee to CalRecycle) in the new City staff person's role (Action SW-1b).	Public Works	Phase 1-3	
Measure WW-1	**Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.**	**Change (%) in per capita potable water consumption**	**Sources: Eastern Municipal Water District, Box Springs Mutual Water Company, and GHG Inventories**	
Action WW-1a	Partner with Eastern Municipal Water District (EMWD) to support and implement updates to their Urban Water Management Plan (UWMP) every five years, as required by the State. These updates will include identified demand reduction actions to comply with the State's "Making Water Conservation a Way of Life" regulations. Specific actions shall include: 1. Amending the Water Shortage Contingency Plans to enforce water waste restrictions for households, businesses, and public infrastructure in Moreno Valley. 2. Engaging with large water users to develop an On-Site Water Reuse Plan that maximizes local water supplies and reduces the energy intensity of distribution. 3. Supporting the City in updating the Model Water Efficient Landscape Ordinance as needed, and work with regional partners to keep developers in Moreno Valley informed of these requirements. 4. Promoting City ordinances or guidelines developed by EMWD for the installation of dual-plumbing systems that utilize greywater or recycled water for irrigation in new residential and commercial constructions. 5. Enhancing community engagement efforts, especially among residents living on low-to-moderate incomes, to increase awareness of water conservation incentives, rebates, and programs aimed at reducing per capita water use. 6. Revising water and wastewater rates in Moreno Valley as necessary to cover the cost of service and promote conservation efforts.	Public Works, Planning Division	Phase 2	
Action WW-1b	Work with EMWD and Box Springs Mutual Water Company (BSMWC) to develop water conservation promotional materials, programs, and outreach efforts. Continue to offer and expand water conservation programs to the community including water education program for schools, water-wise landscape classes, and incentives for water conservation upgrades (e.g., free water conserving devices, rebates for rainwater collection systems).	Public Works	Phase 2-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action WW-1c	Work with EMWD and BSMWC to assess the feasibility and necessity of expanding the recycled water system within Moreno Valley, identifying key areas that could benefit from recycled water use. Based on the results of the assessment, identify projects for the relevant utility agencies to implement to expand recycled water supply and access in Moreno Valley.	Public Works	Phase 2	
Measure CS-1	**Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve Senate Bill 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.**	**Compost procured and applied to lands (tons)**	**Source: Public Works Department**	
Action CS-1a	Enhance compost application in Moreno Valley to comply with Senate Bill (SB) 1383 (2016) through: 1. Enforcing compliance with SB 1383 (2016) in Moreno Valley by establishing a minimum annual level of compost application on public and private lands. 2. Maintaining procurement policies to purchase recovered organic waste products, including compost, in accordance with SB 1383 (2016) requirements. 3. Continuing the regional compost broker program in partnership with Waste Management, Zero Foodprint, and the Western Riverside Council of Governments' (WRCOG) Solid Waste Cooperative.	Purchasing and Sustainability Division	Phase 1-2	
Action CS-1b	Collaborate with Waste Management and the Riverside County Department of Waste Resources to create and distribute promotional materials and educational resources to residents, businesses, and developers on the benefits of compost use, where compost can be obtained (including the free compost offered by the Riverside County Department of Waste Resources at the Lamb Canyon Landfill and Badlands Landfill), and how it can be applied effectively in landscaping and agricultural projects.	Public Works	Phase 1-3	
Action CS-1c	Perform direct outreach to residents living on low incomes, small businesses, and community gardens to connect them with the free compost offered by the Riverside County Department of Water Resources at the Lamb Canyon Landfill and Badlands Landfill. Work with the Riverside County Department of Water Resources to track the compost tonnage used by Moreno Valley community members.	Public Works	Phase 1-3	
Action CS-1d	Conduct a study to identify applicable locations (including City-owned properties, schools, and open spaces) and the quantity of compost that can be applied within the Moreno Valley community to help meet the procurement requirements of SB 1383 (2016). As part of study, evaluate other carbon sequestration opportunities associated with soil amendments such as biochar.[70]	Purchasing and Sustainability Division	Phase 1	

70. *Note that biochar is not considered SB 1383 (2016) recovered waste product; however, biochar is a known soil amendment opportunity with enhanced carbon sequestration which is why it should also be considered as part of the soil amendment study.*

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action CS-1e	Dedicate staff time and resources to researching pathways for maintaining SB 1383 (2016) compliance and applying the compost to lands within the community, including exploring grant funding opportunities for compost procurement and distribution incentive programs.	Public Works, Grants Division	Phase 1-2	
Action CS-1f	Continue partnerships with Waste Management, Zero Foodprint, and the WRCOG's Solid Waste Cooperative to use the regional compost broker program to facilitate the distribution of high-quality compost within the Moreno Valley community to meet SB 1383 (2016) organics procurement goals. Include locations identified in Action CS-1d's compost application study.	Purchasing and Sustainability Division	Phase 1-3	
Measure CS-2	**Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.**	**Change (#) in urban tree stock**	**Source: Community Development**	• **State and federal urban and community forestry gran programs (CALFIRE)**
Action CS-2a	Develop an Urban Forest Master Plan aimed at promoting tree health, enhancing urban resilience, and increasing the co-benefits of tree planting and shading, including urban heat relief. As part of this master plan: 1. Use the Tree Equity Score or conduct an urban tree canopy study to establish a baseline of current canopy coverage by census block, set a percentage coverage goal for each census block, and identify priority planting areas to plant a minimum of 200 new trees per year beginning in 2026. Priority planting areas shall include disadvantaged communities. 2. Engage the community during the development of the plan to identify areas, including public gathering areas, to increase the community's access to trees and shade as well as identify hurdles and solutions to tree maintenance. Focus engagement within disadvantaged communities. The engagement shall include partnerships with local organizations such as Neighborhood Forest. 3. Align the plan with Moreno Valley's Tree Care ordinance by integrating urban heat island mitigation strategies into the master plan and prioritizing tree species that are indigenous to the area and/or suitable for the local climate. Strategies shall include planting trees to create safe, inviting, and functional pedestrian and cyclist environments in residential developments, including street trees planted to provide shade on pedestrian paths, sidewalks, and walkways. 4. Establish a monitoring plan to regularly review the Tree Equity Score or conduct a new urban tree canopy study to assess progress.	Planning Division, Parks and Community Services	Phase 1	
Action CS-2b	Continue to enforce the tree maintenance and protection policies in Moreno Valley's Tree Care ordinance, including the financial penalties for violations with the ordinance. Additionally, continue to implement the Keep MoVal Beautiful initiatives to enable residents, businesses, and community organizations to adopt a park, trail, or road to help increase tree maintenance and coverage.	Public Works, Parks and Community Services	Phase 1-3	

Measure/ Action ID	Measure/Action	Key Performance Indicator/ Responsible City Department(s)	Key Performance Indicator Source/ Implementation Timeframe	Identified Funding Sources
Action CS-2c	Update the City's Keep MoVal Beautiful website to highlight tree maintenance and plantings as a focus of the Adopt a Park, Trail, and Road programs. Include a webpage that lists the tree species that are indigenous to the area and/or suitable for the local climate and list local nurseries that carry such species. Additionally, continue to partner with Neighborhood Forest to offer children free trees for Earth Day. Pursue partnerships with Moreno Valley Unified School District and Val Verde Unified School District to offer the free trees at schools.	Parks and Community Services	Phase 1	
Action CS-2d	Prioritize tree plantings and engagement efforts for Action CS-2a's Urban Forest Master Plan in disadvantaged communities to reduce urban heat island effect and address hurdles to tree maintenance.	Public Works, Parks and Community Services	Phase 1-2	
Action CS-2e	Secure funding through State and federal urban and community forestry grant programs such as CAL FIRE. Continue to reach out to local businesses and community groups to acquire sponsors for the Keep MoVal Beautiful initiative and neighborhoods to fund Landscape Maintenance Districts. In Action CS-2a's Urban Forest Master Plan, establish a goal to apply for at least one major grant every three years to sustain and expand the plan's implementation.	Public Works, Grants Division	Phase 1-2	

Climate Action Plan Monitoring and Updates

Ongoing monitoring and assessment of Moreno Valley's progress are essential for achieving communitywide GHG emissions reductions. Regular tracking, reporting, and updates will ensure accountability in meeting the City's adopted targets. To this end, the City will conduct routine community GHG emissions inventories in alignment with established protocols and climate commitments every two to three years. If the next GHG emissions inventories demonstrate that the City is on track to meet the 2030 targets, further adjustments to CAP strategies may not be necessary.

However, if Moreno Valley does not make measurable and sufficient progress toward its GHG emissions reduction targets by the next GHG emissions inventory, the City may need to revise the CAP to establish new or more ambitious measures and associated actions. This revision would aim to enhance reduction efforts and maintain the CAP's status as a CEQA-qualified GHG emissions reduction plan. The updated CAP may require scaling up of the implementation of existing actions and/or introducing new measures, such as transitioning incentive-based or educational programs into mandatory requirements. Additionally, because Moreno Valley's targets are set using per capita GHG emissions, the City may need to revise the CAP if Moreno Valley's population exceeds projected levels.

Regardless, by 2029, the City is expected to initiate a comprehensive CAP update to address GHG emissions reduction beyond 2030 and prepare for achieving the 2045 carbon neutrality target. This process will involve developing or strengthening of this CAP's measures and actions to align with the 2045 target while also leveraging advancements in technology and new State regulations. To support this effort, the City will continue to implement and monitor the CAP's GHG emissions reduction measures, through the GHG emissions inventory updates and the key performance indicators outlined in Table 4-1, which track the effectiveness of each measure.

APPENDIX A

REGULATORY BACKGROUND AND EXISTING CLIMATE/SUSTAINABILITY EFFORTS

Appendix A - Regulatory Background and Existing Climate/Sustainability Efforts

California Regulatory Background

California remains a global leader in the effort to reduce greenhouse gas (GHG) emissions and combat climate change through its mitigation and adaptation strategies. With the passage of Assembly Bill (AB) 32 in 2006, California became the first state in the United States (U.S.) to mandate GHG emission reductions across its entire economy. To support AB 32, California has enacted legislation, regulations, and executive orders (EO) that put it on course to achieve robust emission reductions and address the impacts of a changing climate. The following is a summary of executive and legislative actions most relevant to the City of Moreno Valley's Climate Action Plan (CAP).

Senate Bill 1078 (2002)

In 2002, (Senate Bill) SB 1078 established the California Renewables Portfolio Standards (RPS) Program and was accelerated in 2006 by SB 107, requiring that 20 percent of retail electricity sales be composed of renewable energy sources by 2010. EO S-14-08 was signed in 2008 to further streamline California's renewable energy project approval process and increase the State's RPS to the most aggressive in the nation at 33 percent renewable power by 2020.

Assembly Bill 1493 (2002)

In 2002, the California State Legislature enacted Assembly Bill 1493 (aka. the Pavley Bill), which directs the California Air Resources Board (CARB) to adopt standards that will achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles," considering environmental, social, technological, and economic factors. In September 2009, CARB adopted amendments to the Pavley regulations to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The Pavley Bill is considered to be the national model for vehicle emissions standards. In January of 2012, CARB approved a new emissions control program for vehicle model years 2017 through 2025. The program combines the control of smog, soot, and GHGs and the requirement for greater numbers of zero emission vehicles into a single package of standards called Advanced Clean Cars.

Executive Order S-3-05 (2005)

EO S-3-05 was signed by the Governor in 2005 establishing Statewide GHG emissions reduction targets for the years 2020 and 2050. The EO calls for the reduction of GHG emissions in California to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The 2050 emission reductions target would put the State's GHG emissions in line with the worldwide reductions needed to reach long-term climate stabilization as concluded by the IPCC *2007 Fourth Assessment Report*.

Assembly Bill 32 (2006)

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the Statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of Statewide GHG emissions.

Based on this guidance, CARB approved a 1990 Statewide GHG baseline and 2020 emissions limit of 427 million metric tons of CO_2 equivalent (MMT CO_2e). The Scoping Plan was approved by CARB on December 11, 2008, and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2014 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 Statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the State's longer-term GHG reduction strategies with other State policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use.

Senate Bill 107 (2006)

SB 107 builds on SB 1078 and requires investor-owned utilities, energy service providers, and Community Choice Aggregations to procure an additional one percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. The California Public Utilities Commission and California Energy Commission are jointly responsible for implementing the program.

Executive Order S-1-07 (2007)

Also known as the Low Carbon Fuel Standard, EO S-1-07, issued in 2007, established a Statewide goal that requires transportation fuel providers to reduce the carbon intensity of California's transportation fuels by at least ten percent by 2020. EO S-1-07 was readopted and amended in 2015 to require a 20 percent reduction in carbon intensity by 2030, the most stringent requirement in the nation. The new requirement aligns with California's overall 2030 target of reducing climate changing emissions 40 percent below 1990 levels by 2030, which was set by SB 32 and signed by the Governor in 2016.

Senate Bill 97 (2007)

Signed in August 2007, SB 97 acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

Senate Bill 375 (2008)

SB 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved by passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the State's 18 major Metropolitan Planning Organizations (MPOs) to prepare a sustainable communities strategy that contains a growth strategy to meet these emission targets for inclusion in the MPO's Regional Transportation Plan (RTP).

Executive Order S-14-08 (2008)

EO S-14-08 was issued in 2008 and sets a Statewide target of 33 percent renewable energy use by 2020.

California Green Building Code (2009)

The California Green Building Standards Code (CALGreen) is Part 11 of the California Building Standards Code or Title 24 of the California Code of Regulations and is the first Statewide "green" building code in the nation. The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings. Enhancements include reduced negative impact designs, positive environmental impact designs, and encouragement of sustainable construction practices. The first CALGreen Code was adopted in 2009 and has been updated in 2013, 2016, and 2019. The CALGreen Code will have subsequent, and continually more stringent, updates every three years.

Senate Bill X7-7 (2009)

In 2009, SB X7-7, also known as the Water Conservation Act, was signed, requiring all water suppliers to increase water use efficiency. This legislation sets an overall goal of reducing per capita urban water use by 20 percent by 2020.

Senate Bill 2X (2011)

In 2011, SB 2X was signed, requiring California energy providers to buy (or generate) 33 percent of their electricity from renewable energy sources by 2020.

Assembly Bill 341 (2012)

AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 2012, businesses were required to recycle, and jurisdictions had to implement a program that includes education, outreach, and monitoring. AB 341 also set a Statewide goal of 75 percent waste diversion by the year 2020.

Assembly Bill 32 Scoping Plan Update (2014)

In 2014, CARB approved the first update to the Scoping Plan. This update defined CARB's climate change priorities and set the groundwork to reach the post-2020 targets set forth in EO S-3-05. The update highlighted California's progress toward meeting the near-term 2020 GHG emissions reduction target, defined in the original Scoping Plan. It also evaluated how to align California's longer-term GHG reduction strategies with other Statewide policy priorities, such as water, waste, natural resources, clean energy, transportation, and land use.

Assembly Bill 1826 (2014)

AB 1826 was signed in 2014 to increase the recycling of organic material. GHG emissions produced by the decomposition of these materials in landfills were identified as a significant source of emissions contributing to climate change. Therefore, reducing organic waste and increasing composting and mulching are goals set out by the AB 32 Scoping Plan. AB 1826 specifically required jurisdictions to establish organic waste recycling programs by 2016 and phased in mandatory commercial organic waste recycling over time.

Senate Bill 350 (2015)

SB 350, the Clean Energy and Pollution Reduction Act of 2015, has two objectives: to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and to double the energy efficiency of electricity and natural gas end users through energy efficiency and conservation.

Executive Order B-30-15 (2015)

In 2015, EO B-30-15 was signed, establishing an interim GHG emissions reduction target to reduce emissions to 40 percent below 1990 levels by 2030. The EO also calls for another update to the CARB Scoping Plan.

Assembly Bill 1236 (2015)

AB 1236 includes specific provisions to streamline the permitting process for electric vehicle (EV) charging stations. This includes expedited permitting, standardized review, electronic applications, and administrative approval to facilitate a more efficient EV charging station permitting process. These measures aim to accelerate the deployment of EV charging infrastructure, supporting California's goals to reduce GHG emissions and promote the use of zero-emission vehicles.

Senate Bill 32 (2016)

On September 8, 2016, the governor signed SB 32 into law, extending AB 32 by requiring the State to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). The bill charged CARB to adopt the regulation so that the maximum technologically feasible emissions reductions are achieved in the most cost-effective way.

Senate Bill 1383 (2016)

Adopted in September 2016, SB 1383 required CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. The bill requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also required CalRecycle, in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. The bill further required 20 percent of edible food disposed of at the time to be recovered by 2025.

Scoping Plan Update (2017)

On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 goal set by SB 32. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted policies, such as SB 350 and SB 1383.

The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2014 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with Statewide per capita goals of six metric tons (MT) CO_2e by 2030 and two MT CO_2e by 2050. As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State (CARB 2017).

Senate Bill 100 (2018)

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the State's RPS Program, which was last updated by SB 350 in 2015. SB 100 required electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

Executive Order B-55-18 (2018)

On September 10, 2018, the governor issued EO B-55-18, which established a new Statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing Statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

Executive Order N-79-20 (2020)

In September 2020, EO N-79-20 requires that, by 2035, all new cars and passenger trucks sold in California be zero-emission vehicles. EO N-79-20 also requires that 100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks and notes that the State shall transition to 100 percent zero-emission off-road vehicles and equipment by 2035, where feasible.

Executive Order N-79-20 (2020)

On September 23, 2020, the governor issued EO N-79-20, which sets new Statewide goals for phasing out gasoline-powered cars and trucks in California, which is applicable to State agencies. The EO requires 100 percent of in-State sales of new passenger cars and trucks to be zero-emission by 2035; 100 percent of in-State sales of medium- and heavy-duty trucks and buses to be zero-emission by 2045, where feasible; and 100 percent of off-road vehicles and equipment sales to be zero-emission by 2035, where feasible.

Senate Bill 27 (2021)

Adopted on September 23, 2021, SB 27 required the State Natural Resources Agency to establish carbon sequestration goals for natural and working lands by July 2023. SB 27 also required the Natural Resources Agency to create a registry of projects for public and private investment and track the carbon benefits of each project. The projects that would be part of this program may not generate compliance offsets under California's Cap-and-Trade program. Additionally, as part of the next Scoping Plan Update, CARB was required to establish specific CO_2 removal targets starting in 2030.

Assembly Bill 970 (2021)

This bill requires applications for EV charging stations to be deemed complete within five or ten business days, depending on the number of stations proposed, unless a written correction notice is issued. Applications must be approved within 20 or 40 business days after being deemed complete, unless there are specific findings or appeals. The bill does not change the role of local publicly owned electric utilities in providing new electric services. Cities and counties must reduce the required parking spaces to accommodate EV charging stations. The provisions took effect on January 1, 2022, for larger cities and January 1, 2023, for smaller ones.

Small Off-road Engine Regulations (2021)

In 2021, CARB approved amendments to the Small Off-road Engine (SORE) Regulations. The SORE regulations are intended to reduce emissions from equipment with SOREs and transition such equipment to zero-emission equipment. SORE equipment includes spark-ignition engines 25 horsepower, or below, which are used in most lawn and garden equipment. The regulations set emission standards for smog-forming pollutants to zero for all new SOREs (except for generator and large pressure washer engines) beginning with model year 2024. The regulations set more stringent emission standards for new portable generators and large pressure washer engines beginning with model year 2028. The regulations apply to manufacturers, sellers, retailers, and distributors producing, distributing, and selling new SOREs.

U.S. EPA has granted CARB an authorization to waive federal preemption for its current SORE regulations. CARB will fully implement the regulations beginning with the 2026 model year and implement the regulations for the remainder of the 2025 model year.[1]

Senate Bill 379 (2022)

Adopted September 16, 2022, SB 379 requires cities and counties to implement an online, automated permitting platform to verify solar installation code compliance and issue permits in real time for residential solar energy systems no larger than 38.4 kilowatt hours.

[1] California Air Resources Board (CARB). Small Off-Road Engine Regulations Frequently Asked Questions (January 2025). Accessed at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/sore21/carb_sore_faq.pdf.

Senate Bill 1020 (2022)

Adopted September 16, 2022, SB 1020 expedites the previous goals established by SB 100, by establishing a clean electricity goal for end-use customers of 90 percent by 2035, and 95 percent by 2040. Additionally, SB 1020 requires 100 percent of all electricity procured to serve all State agencies to be clean energy by December 31, 2035.

Senate Bill 1063 (2022)

Adopted September 16, 2022, SB 1063 creates appliance efficiency standards set by the State Energy Resources Conservation and Development Commission, which may now take effect sooner than one year after their adoption/revision. SB 1063 builds on Title 20 efficiency standards enforced through the California Energy Commission and first adopted in 1977.

Assembly Bill 1909 (2022)

Adopted September 16, 2022, AB 1909 removed prohibition of operating motorized electric bicycles or Class 3 bikes on bicycle paths or trails, bikeways, or bicycle lanes. However, the bill also included an exemption for the Department of Parks and Recreation, which may prohibit these classes of bicycles on any bicycle path or trail within the Department's jurisdiction, where appropriate.

Assembly Bill 1857 (2022)

Adopted September 16, 2022, AB 1857 amended various sections of the California Integrated Waste Management Act of 1989, which required jurisdictions to divert 50 percent of solid waste through source reduction, recycling, and composting activities, with no more than ten percent through transformation. AB 1857 repealed the provision that jurisdictions may divert ten percent through transformation (e.g., incineration). Additionally, AB 1857 required the Department of Resources Recycling and Recovery to establish the Zero-Waste Equity Grant Program to support targeted strategies and investments in communities transitioning to zero-waste circular economies.

Assembly Bill 1985 (2022)

Adopted September 16, 2022, AB 1985 established penalties applied to jurisdictions for not meeting SB 1383 requirements. Penalties will be based on the percentage of the target the jurisdiction was able to achieve.

Assembly Bill 1279 (2022)

In September 2022, AB 1279 (e.g., the California Climate Crisis Act) was approved, which established a legally binding requirement for California to achieve and maintain carbon neutrality no later than 2045. Assembly Bill 1279 also established the requirement to achieve a Statewide reduction in GHG emissions of 85 percent below 1990 levels by 2045. This indicates that the remaining 15 percent to achieve carbon neutrality can be achieved via carbon sequestration and other non-direct-GHG-emissions-reductions techniques.

2022 Scoping Plan Update (2022)

In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality in November 2022. The 2022 Scoping Plan builds upon the framework established by the 2008 Climate Change Scoping Plan and previous updates while identifying new, technologically feasible, cost-effective, and equity-focused paths to achieve California's climate goals. The 2022 Scoping Plan includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action in natural working lands to reduce emissions and sequester carbon, and the capture and storage of carbon. The 2022 Scoping Plan assesses the progress California is making toward reducing its GHG emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan, addresses recent legislation and direction from Governor Newsom, extends and expands upon these earlier plans, and implements a goal of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045, as well as taking an additional step of adding carbon neutrality as a science-based guide for California's climate work.[2]

Advanced Clean Cars II (2022)

By 2035 all new passenger cars, trucks and SUVs sold in California will be zero emission vehicles. The Advanced Clean Cars II regulations take the State's already growing zero-emission vehicle market and robust motor vehicle emission control rules and augments them to meet more aggressive tailpipe emissions standards and ramp up to 100 percent zero-emission vehicles.

Enforcement of the Advanced Clean Cars II regulation remains uncertain at this time. On June 12, 2025, House Joint Resolution 88 was signed into law nullifying the U.S. EPA's notice which granted CARB's request for the regulation. The future of implementation remains unclear as California pursues legal action against the resolution.

Senate Bill 1020 (2022)

SB 1020, also known as the Clean Energy, Jobs, and Affordability Act of 2022, would build off of existing laws and require that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and 100 percent of electricity procured to serve all State agencies by December 31, 2035, as specified.

Advanced Clean Fleets Regulation (2023)

Adopted by CARB in 2023, the Advanced Clean Fleets (ACF) regulation requires fleets that are well suited for electrification to reduce emissions through requirements to phase-in the use of zero-emission vehicles (ZEVs) for targeted fleets.

In 2025, California withdrew the request for a federal waiver for the addition of the ACF regulation to the State's emissions control program. At this time, CARB is not enforcing the portions of the ACF regulation that require a federal waiver. However, not all elements of the ACF regulation require a federal waiver or authorization. The State and local government fleets portion of the ACF regulation remains unaffected. Additionally, CARB is encouraging affected industries and fleets to continue reducing their GHG emissions.

In-Use Off-Road Diesel-Fueled Fleets Regulation (2023)

In 2023, CARB's amendments to the In-Use Off-Road Diesel-Fueled Fleets Regulation were approved. The amended regulation requires all subject fleets to procure and use renewable diesel

[2] CARB. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf (accessed November 2023)

(R99 or R100) in self-propelled off-road diesel vehicles over 25 horsepower and most two-engine vehicles beginning January 1, 2024. The amended regulation has limited exceptions including exceptions for locomotives, marine vessels, and personal-use off-road vehicles.

Senate Bill 1418 (2024)

SB 1418 requires every city, county, or city and county to adopt an ordinance that creates an expedited, streamlined permitting process for certain hydrogen-fueling stations. Cities and counties must create a checklist of requirements for expedited review. Those with populations of 250,000 or more must comply by September 30, 2025, while smaller cities and counties must comply by September 30, 2028. This bill imposes additional duties on local governments, creating a State-mandated local program.

Assembly Bill 98 (2024)

On September 29, 2024, AB 98 was signed into law, enhancing California's regulation of warehouses and trucking to reduce emissions and improve community health. Effective January 1, 2026, the bill requires cities and counties to update their circulation elements, including truck routes, by January 1, 2028. AB 98 aligns with existing regulations like the South Coast Air Quality Management District's warehouse indirect source rule (i.e., the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program) and the CARB's Advanced Clean Trucks and Fleets regulations. The bill mandates energy-saving features such as solar panels and EV charging stations, a transition to zero-emission forklifts by 2030, buffer zones between warehouses and sensitive areas, and truck routes that avoid residential neighborhoods. While it imposes additional costs and regulatory burdens on warehouse and truck operators, it aims to significantly reduce emissions and enhance community health.

Existing Moreno Valley Climate/Sustainability Efforts

Moreno Valley has been proactive in its climate and sustainability efforts through various initiatives. From energy efficiency programs to EV charger planning, the City has implemented many climate and sustainability initiatives which set the foundation for the CAP. The following is a summary of the City of Moreno Valley's existing climate and sustainability initiatives.

Moreno Valley 2024 General Plan Update

The City of Moreno Valley 2024 General Plan Update serves as Moreno Valley's roadmap for growth through 2040. It includes policies that direct various aspects such as economic development, transportation, housing types, open-space preservation, community spaces, and public health and safety. In addition to the preparation of the General Plan Update, the City is also developing the CAP and will assess potential environmental impacts resulting from the implementation of the General Plan Update and the CAP through a Revised Program Environmental Impact Report (Revised EIR). Adoption of the 2024 General Plan Update is anticipated for August 2025.

Energy Efficiency and Climate Action Strategy

Approved in 2012, Moreno Valley's Energy Efficiency and Climate Action Strategy (Strategy) served as a policy document to identify ways that the City can reduce municipal energy consumption, water consumption, and GHG emissions as an organization and outline the actions that the City can implement to encourage community members to reduce their own energy consumption, water consumption, and GHG emissions. The primary goals of the Strategy were to minimize the environmental and financial impacts of energy use and GHG emissions in municipal facilities and the community. The Strategy originated from the Federal Energy Efficiency and Conservation Block Grant awarded to the City to implement energy efficiency projects. At the City Council's request, the grant's scope was expanded to include the development of a climate action strategy. With the support of the City Council, City staff applied for additional energy efficiency grants. In June 2010, the City received a $375,000 grant from Southern California Edison (SCE) to expand the Strategy's scope and implementation, including preparing a GHG inventory for the community.[3]

Moreno Valley Electric Utility

The Moreno Valley Electric Utility (MVU) provides electrical services to the City of Moreno Valley, as well as infrastructure enhancement, community development, and environmentally responsible resource management.[4] MVU was established in 2001 to grow the business and industrial community within the City of Moreno Valley, serving about 8,900 customers or approximately ten percent of the Moreno Valley community today. MVU offers several discount and subsidy programs to help customers manage their utility costs. Programs include the Medical Baseline Plan, Utility Tax Exemption, Emergency Assistance Fund, and Energy Bill Assistance Program.

- **Medical Baseline Plan:** provides additional energy at a lower rate for customers with medical conditions requiring life-support devices or other medical equipment. The plan offers an extra 16.5 kilowatt-hours of electricity per day to help manage increased energy needs.[5]
- **Utility Tax Exemption:** allows low-income households in Moreno Valley to apply for an exemption from the utility users tax. To qualify, the combined gross income of all household members must be less than 65 percent of the median household income for Riverside County, as defined by the U.S. Department of Housing and Urban Development (HUD).[6]
- **Emergency Assistance Fund**: provides a one-time bill credit of up to $1,200 for customers facing financial hardships.
- **Energy Assistance Program:** offers a 23 percent or 35 percent discount on monthly energy charges for income-qualified households.[7]

MVU also offers the GREEN MoVal and following EV programs to residential and commercial customers.

GREEN MoVal

GREEN MoVal is an initiative by the City of Moreno Valley to promote energy efficiency among residents and businesses. The initiative provides rebate and technical assistance programs to support MVU customers in installing items or appliances that help save energy, lower bills, boost economic growth, reduce the need for energy generation, and minimize environmental impacts. GREEN MoVal provides each eligible MVU household up to $4,000 to cover expenses for new whole house fans, energy star ceiling fans, solar screens, smart thermostats, high-efficiency heating,

[3] City of Moreno Valley. 2012. Energy Efficiency and Climate Action Strategy. Accessed at: https://www.moval.org/pdf/efficiency-climate112012nr.pdf.
[4] City of Moreno Valley Public Works. 2025. About Moreno Valley Utility. Accessed at: https://www.moval.org/mvu/.
[5] Moreno Valley Utility. Medical Baseline Allowance Application. Accessed at: https://moval.gov/mvu/pdfs/med-base-appl.pdf.
[6] City of Moreno Valley. 2025. Utility Users Tax Exemption. Accessed at: https://moval.gov/city_hall/forms/business-gen/utilitytax-exemption.pdf.
[7] Moreno Valley Utility. Energy Bill Assistance for Qualified Customers. Accessed at: https://moval.org/mvu/pdfs/low-income.pdf.

ventilation, and air conditioning (HVAC) motors, and more. GREEN MoVal also includes the following energy efficiency programs for MVU residents and businesses.[8]

FOR RESIDENTS

- Residential Energy Audits and Direct Install
- Energy Star Appliance Rebate
- Central Air Conditioning (AC) and Heat Pump Replacement
- Central AC and Heat Pump Tune-up
- Cooling Rewards
- Customer Energy-Efficiency Programs

FOR BUSINESS

- Commercial Energy Load Program
- New Construction and Major Tenant Renovation
- Commercial Energy Audits and Direct Install
- Commercial Central AC & Heat Pump Tune-up
- Commercial Heating, Ventilation, and HVAC Retrofits
- Chiller Retrofits
- Thermal Energy Storage
- Lighting Retrofits
- Motor Replacements
- Miscellaneous Energy-Saving Retrofits

555 Electric Vehicle Program and CLEAN Charge Program

MVU offers the 5-5-5 EV Incentive Program (555 EV Program) to residential customers and the Commercial EV Assistance for New Energy (CLEAN) Charge Program to commercial customers. The 555 EV Program, introduced in 2024, offers a $500 rebate on EV purchases or leases, a $500 rebate on charging station purchases and installations, and a $50 discount on monthly electric bills for registered EV owners. The CLEAN Charge Program, introduced in 2025, offers a $1,000 rebate for the purchase and installation of a charging station.[9]

Bicycle Master Plan

Adopted in 2014, the Bicycle Master Plan (Plan) guides design and implementation of infrastructure, programs, and policies as Moreno Valley grows and facilities are planned and sited. The Bicycle Master Plan was funded by a California Department of Transportation (Caltrans) Community Based Transportation Planning (CBTP) Grant and served to update Moreno Valley's Bicycle Transportation Plan to align with other regional plans. The Bicycle Master Plan has three main purposes:

- Align with the Western Riverside Council of Governments (WRCOG) Non-Motorized Transportation Plan and other regional plans to support the Southern California Association of Governments (SCAG) GHG reduction efforts;
- Incorporate the latest innovations in bicycle planning, such as buffered lanes and enhanced signal detection, and integrate cycling with other transportation modes like Metrolink and Amtrak; and,

[8] City of Moreno Valley. GREEN MoVal. Accessed at: https://moval.gov/green/index.html#tab-1.
[9] City of Moreno Valley. Electric Vehicle Incentives. Accessed at: https://moval.gov/mvu/ev-incentives.html.

- Identify and address deficiencies in the existing bicycle network to improve connectivity and safety, thereby increasing ridership and making cycling a more viable transportation option.[10]

Hire MoVal Program

Hire MoVal is an initiative offering incentives to businesses in Moreno Valley that employ local residents. First piloted in 2017, the program rewards businesses in Moreno Valley that hire from within the community. Within the latest expansion, eligible businesses can receive a discount equivalent to the annual Business License Processing Fee. Currently, there are three Hire MoVal incentives:

- **Hire a MoVal Grad**: a $1,000 stipend for hiring Moreno Valley residents who have graduated from local colleges or schools.
- **Hire MoVal**: Assists businesses in advertising job openings locally and offers Moreno Valley Utility customers electrical rate discounts for hiring local residents.
- **Hire MoVal for Small Business**: provides business license discounts, free counseling, and job advertisement.[11]

EV Charging Infrastructure Master Plan

Developed in 2024, the City of Moreno Valley's EV Charging Infrastructure Master Plan acts as a strategic guide, enabling the City to leverage future federal, State, and regional funding opportunities aimed at expanding the public EV charging network.[12] This plan outlines a detailed roadmap for developing EV infrastructure over the next five to ten years, directing strategic investments and infrastructure placement to accommodate the expected increase in EV usage.

Keep MoVal Beautiful Program

Keep MoVal Beautiful is a program supporting initiatives to beautify the community.[13] Launched in 2021, the program has three main goals:

- **Beautify MoVal Parks.** Participants can commit to annual clean-ups, provide monetary or in-kind donations, and receive recognition for their efforts. The program aims to enhance the quality of life and civic pride in Moreno Valley through community engagement and environmental stewardship.[14]
- **Beautify MoVal Trails.** Volunteers can choose to volunteer for any of the 40 trail segment opportunities available to conduct clean-ups and enhancements. Those who are not able to volunteer can also encourage environmental awareness and community pride through donations or corporate sponsorships.[15]

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[10] City of Moreno Valley Public Works. Bicycle Master Plan. Accessed at: https://moreno-valley.ca.us/departments/public-works/plan-bicycle-master.html.
[11] City of Moreno Valley Financial and Management Services. Hire MoVal. Accessed at: https://moval.gov/departments/financial-mgmt-svcs/prog-hireMoVal.html.
[12] City of Moreno Valley Public Works. Electric Vehicle Charging Master Plan. Accessed at: https://moreno-valley.ca.us/departments/public-works/plan-ev-charging-master.html.
[13] City of Moreno Valley. 2023-2024. Keep MoVal Beautiful. Accessed at: https://moval.org/beautify/.
[14] City of Moreno Valley. Beautify MoVal Parks. Accessed at: https://moval.org/beautify/docs/KMVB-Parks.pdf.
[15] City of Moreno Valley. Beautify MoVal Trails. Accessed at: https://moval.org/beautify/docs/KMVB-Trails.pdf.

- **Beautify MoVal Roads.** This program provides opportunities for community volunteers and businesses to help beautify over 100 Moreno Valley road segments through volunteer programs, service days, or sponsorship/donation opportunities.[16]

World Logistics Center

The World Logistics Center (Center) is a planned logistics and business park development encompassing over 100 million square feet of available land. The Center has made several sustainability efforts to mitigate its GHG emissions impact. Through the purchase and retirement of verified carbon offset credits, the Center has offset the GHG emissions resulting from the construction and operation of the Center from about 6.3 MMT CO_2e to net zero.[17] The Center also adopted several policies to mitigate GHG emissions at the Center and within the community. These include installing the maximum amount of on-site solar generation, providing EV chargers, and using zero- or low-emission off-road equipment at the Center. The policies also include funding grants for the purchase of electric heavy-duty trucks, medium-duty trucks, delivery trucks, and passenger vehicles within the community; funding outreach, education, and training on zero-emission vehicles and maintenance; and funding a regional approach to encourage solar generation.

[16] City of Moreno Valley. Beautify MoVal Roads. Accessed at: https://moval.org/beautify/docs/KMVB-Roads.pdf.

[17] In a conservative approach, the GHG emissions inventory, forecasts, targets, and reduction measures developed for the Moreno Valley CAP do not include any of the GHG emissions reduction associated with the purchase and retirement of the Center's carbon offset credits.

MORENO VALLEY
WHERE DREAMS SOAR

APPENDIX B

2019 GREENHOUSE GAS EMISSIONS INVENTORY

Rincon Consultants, Inc.
250 East 1st Street, Suite 1400
Los Angeles, California 90012
213-788-4842

April 21, 2025
Project No: 24-16405

Angelica Frausto-Lupo
Community Development Director, City of Moreno Valley
14177 Frederick Street
Moreno Valley, California 92553
Via email: angelicaf@moval.org

Subject: City of Moreno Valley 2019 Community Greenhouse Gas Inventory Summary – Updated Climate Action Plan for the City of Moreno Valley

A greenhouse gas (GHG) emissions inventory was prepared for the City of Moreno Valley (the City) as part of the City's Updated Climate Action Plan (CAP). The 2019 Community GHG emissions inventory (the Inventory) includes communitywide emissions from residents and businesses operating within City. The inventory includes sources within sectors that are under the jurisdictional control of the City and is intended to provide an understanding of emissions during the 2019 calendar year and ultimately help track the trajectory of the City's GHG emissions over time. The City selected 2019 as the calendar year for Moreno Valley's community GHG emissions inventory because this was the year with most complete data available at the time of completion.[1]

GHG Emissions Inventory Methodology

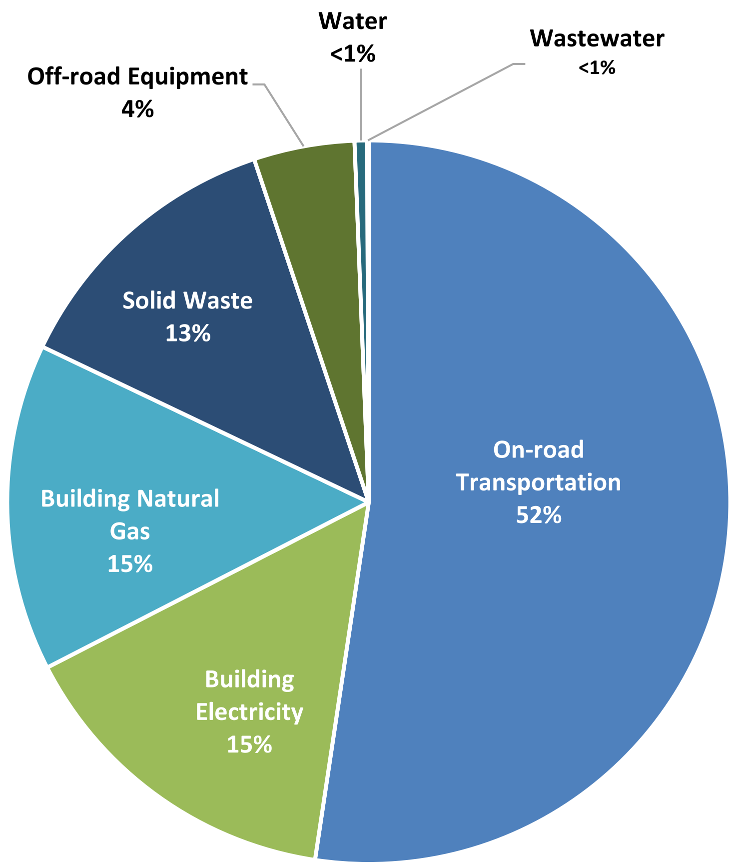
The Inventory was developed pursuant to the International Council for Local Environmental Initiatives (ICLEI) methodologies,[2] specifically, the United States Community Protocol for Accounting and Reporting Greenhouse Gas Emissions Version 1.2 (Community Protocol).[3] The GHG inventory was conducted in alignment with the most recent available data sources, emission factors, and Global Warming Potentials (GWP) from the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (AR4).[4] AR4 GWPs were selected to align with the methodology used in the California Air Resources Board's (CARB) State GHG Emission Inventory, allowing for consistency and comparability with State-level data.[5] The Inventory encompasses sectors associated with City's community activities and over which the local government has jurisdictional control or influence (i.e., building energy, transportation, solid waste, water, and wastewater). Other sectors, such as industrial and agriculture emissions, were excluded due to jurisdictional control constraints or considerations related to State legislation.[6] The included sectors align with the Community Protocol best practices.

[1] Selecting a pre-COVID-19 pandemic baseline year also avoids potential distortions in GHG emissions trends due to the temporary reductions in activity caused by the COVID-19 pandemic. Studies have shown that global daily GHG emissions in April 2020 were approximately 17 percent lower than in the same month of 2019, with the most significant reductions occurring in the transportation, manufacturing, and power generation sectors (Le Quéré et al., 2020).
Le Quéré et al., 2020. COVID-19 impact on an academic Institution's greenhouse gas inventory: The case of Cornell University. Accessed at: https://www.sciencedirect.com/science/article/pii/S0959652622020418#bib13
[2] ICLEI. Accessed at: https://iclei.org/
[3] ICLEI. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Accessed at: https://icleiusa.org/us-community-protocol/
[4] Intergovernmental Panel on Climate Change's (IPCC). 2007. Climate Change 2007: Synthesis Report. Available at: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf
[5] California Air Resources Board (CARB). Current California GHG Emission Inventory Data. Accessed at: https://ww2.arb.ca.gov/ghg-inventory-data
[6] The inventory excludes point source industrial emissions because these emissions activities are generally outside the jurisdictional control of the City and are instead regulated by the State's Cap-and-Trade program. The inventory also excludes Southern California Edison electricity consumption and natural gas consumption by industrial and agricultural customers in Moreno Valley; but, due to data limitations, includes Moreno Valley Utility electricity consumption from all nonresidential customers (i.e., commercial, industrial, and agricultural customers).

Summary of Results

In 2019, the City of Moreno Valley emitted 1,257,593 metric tons of carbon dioxide equivalents (MT CO_2e).[7] Figure 1 shows the share of total emissions for the community broken out by sector. Table 1 provides more detail by providing the activity data, emission factors, and the associated emissions for each sector. Table 2 provides details on activity data and emissions factor sources. GHG emissions were primarily driven by on-road transportation, followed by building natural gas and electricity consumption. A brief breakdown of each sector is provided below.

Figure 1 2019 GHG Emissions (MT CO_2e)



[7] CO_2e is a metric used to quantify and aggregate the effects of various greenhouse gases into a single value, expressed in terms of the equivalent amount of CO_2, because different gases have varying global warming potentials which means they differ in their ability to trap heat in the atmosphere over a specific time period. One MT CO_2e is equivalent to driving 2,547 miles in an average gasoline-powered passenger vehicle. Source: U.S. EPA Greenhouse Gas Equivalencies Calculator. November 2024. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results. Accessed December 20, 2024.

Table 1 2019 GHG Emissions

Emissions Sector	Emissions Sub Sector	Activity Data	Unit	Emission Factor	Unit	Emissions (MT CO_2e)	Percent of Total
Electricity	Residential Electricity[1]	407,057,554	kWh	0.000247	MT CO_2e/kWh	100,411	8%
	Nonresidential Electricity	339,405,399	kWh	0.000263	MT CO_2e/kWh	89,112	7%
Natural Gas	Residential Natural Gas[2]	22,438,026	therms	0.006463	MT CO_2e/therm	145,016	12%
	Nonresidential Natural Gas	6,021,918	therms	0.006463	MT CO_2e/therm	38,919	3%
Transportation	Passenger Total VMT	1,511,335,632	VMT	0.000408	MT CO_2e/mile	559,445	44%
	Commercial Total VMT	70,144,209	VMT	0.001491	MT CO_2e/mile	94,883	8%
	Bus Total VMT	1,840,112	VMT	0.001878	MT CO_2e/mile	3,135	0.2%
	Passenger EVMT	4,908,707	kWh	0.000247	MT CO_2e/kWh	1,211	0.1%
	Commercial EVMT	0	kWh	0.000263	MT CO_2e/kWh	0	0.0%
	Bus EVMT	18,842	kWh	0.000263	MT CO_2e/kWh	5	<0.1%
	Off-road Equipment - Diesel	4,218,527	Gallons	0.010498	MT CO_2e/gallon	44,285	4%
	Off-road Equipment - Gasoline	1,192,668	Gallons	0.009175	MT CO_2e/gallon	10,943	1%
	Off-road Equipment - Natural Gas	245,730	Gallons	0.005882	MT CO_2e/gallon	1,445	0.1%
Solid Waste	Solid Waste[3]	168,968	tons	0.947028	MT CO_2e/ton	160,875	13%
Wastewater	Wastewater[4]	N/A	N/A	N/A	N/A	889	0.1%
Water	Water	33,764,530	kWh	0.0002079	MT CO_2e/kWh	7,020	0.6%
Total						**1,257,593**	**100%**

Notes: VMT = Vehicle Miles Travelled; EVMT = Electric Vehicle Miles Travelled; kWh = kilowatt-hour; MT CO_2e = metric tons of carbon dioxide equivalents; N/A = not applicable. Percentages may not add up to 100 percent due to rounding.

[1,2] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

[3] Solid Waste sector includes emissions from landfill processing (i.e., processing equipment fuel combustion).

[4] Wastewater sector activity data is N/A because there are several calculations involved. Please see the GHG inventory tool for all wastewater activity data and calculation parameters.

Table 2 2019 Community Data Sources and Emission Factors by Sector

Sector	Utility Providers	Activity Data Source	Emissions Factor Source
Electricity	Southern California Edison (SCE) Moreno Valley Electric Utility (MVU)	Energy use data by category provided by SCE 2019 Utility Data Energy use data by category provided by MVU	California Energy Commission (CEC) Power Content Labels for each provider
Natural Gas	Southern California Gas Company (SoCal Gas)	Energy use data by category provided by SoCal Gas 2019 Utility Data	U.S. EPA GHG Emission Factor hub
Transportation	N/A	On-road: VMT data based on 2024 General Plan Update Off-road: Fuel consumption from CARB's OFFROAD2021 model	On-road: CARB's EMFAC2021 model Off-road: U.S. EPA GHG Emission Factor hub
Solid Waste	N/A	Tonnage sent to landfill from CalRecycle	ICLEI Community Protocol defaults (Appendix E - Solid Waste Emission Activities and Sources, Table SW.5)
Wastewater	N/A	Various activity data from Moreno Valley Regional Water Reclamation Facility (MVRWRF) Various activity data estimated for Edgemont Community Services District (ECSD)	ICLEI Community Protocol defaults (Appendix F Wastewater and Water Emission Activities and Sources, EQ WW.1, WW.2, WW.7, WW.12, WW.15)
Water	N/A	Water consumption and supply data from Eastern Municipal Water District (EMWD) Water consumption and supply data estimated for Box Springs Mutual Water Company (BSMWC)	California Energy Commission (CEC) Power Content Label for SCE U.S. EPA Emissions & Generation Resource Integrated Database (eGRID)

Notes: Details on the data sources, including citations, are provided in the below subsections under Breakdown of Sectors.

The Inventory relies on the best available data and calculation methodologies based on the understanding of the activities within Moreno Valley developed as part of this inventory. In cases where direct activity data or emissions factors specific to Moreno Valley are unavailable, default factors from ICLEI's Community Protocol (i.e., for solid waste and wastewater emissions factors) or reasonable estimation methodologies are employed (i.e., for ECSD's wastewater treatment activity data and BSMWC's water activity data). The estimation methodologies are guided by ICLEI's Community Protocol and deemed to be the most appropriate options based on the understanding of the sector activities within Moreno Valley. These methodologies are provided in each sector breakdown below, providing transparency and alignment with established best practices and ICLEI's Community Protocol.

Breakdown of Sectors

A brief breakdown of each major sector, including a discussion of activity data and emission factors, is provided below.

Transportation

Transportation emissions in the City of Moreno Valley are primarily driven by the combustion of fossil fuels like gasoline, diesel, and natural gas, resulting from both on-road and off-road vehicles and equipment. A small portion of on-road emissions is attributed to electricity used by electric vehicles (EVs). On-road sources include passenger cars, commercial trucks, and buses, while off-road sources range from lawn and garden equipment to construction machinery. Activity data for on-road emissions, measured in vehicle miles traveled (VMT), is based on estimates for Moreno Valley's 2024 General Plan Update. Activity data for off-road emissions, based on fuel consumption (gallons), were sourced from CARB's OFFROAD model for Riverside County[8] and allocated to the City using demographic data. Emission factors (MT CO_2e/VMT) and EV percent breakdown for all on-road vehicle types were derived from CARB's 2021 EMission FACtor (EMFAC2021) model.[9] Emission factors for all off-road vehicle and equipment types (MT CO_2e/gallon of fuel) were derived from the Environmental U.S. EPA GHG Emission Factor hub.[10]

In 2019, emissions from passenger vehicles made up 85 percent of transportation emissions, followed by 14 percent from commercial vehicles. Emissions from off-road diesel consumption made up 78 percent of off-road transportation emissions, followed by 19 percent from gasoline vehicles and three percent from natural gas.

Building Energy – Electricity and Natural Gas

Building energy emissions in the City of Moreno Valley are primarily driven by electricity consumption, including transmission and distribution losses, and the combustion of natural gas for space and water heating and cooling, cooking, and other appliance use. Natural gas emissions also result from pipeline and end-use leakage. Electricity usage data, measured in kilowatt-hours (kWh), were sourced directly from the City's providers—Moreno Valley Electric Utility (MVU) and Southern California Edison (SCE)—and categorized by customer type, including residential and commercial customers.[11] Similarly, natural gas data, measured in therms, was obtained from the Southern California Gas Company (SoCal Gas) and broken down by customer category. The emission factor for electricity (MT CO_2e/kWh) was derived from each provider's Power Content Label, a product of the California Energy Commission's (CEC) Power Source Disclosure Program while the emission factor for natural gas (MT CO_2e/therm) was sourced from the EPA's Emission Factor Hub.[12, 13, 14, 15]

In 2019, emissions from residential natural gas made up 39 percent of building energy emissions, followed by 27 percent from residential electricity, 24 percent from nonresidential electricity, and 10 percent from nonresidential natural gas.

[8] CARB OFFROAD model v1.0.7. Accessed October 2024. Available at: https://arb.ca.gov/emfac/offroad/
[9] CARB EMFAC model v1.0.2. Accessed October 2024. Available at: https://arb.ca.gov/emfac/
[10] EPA GHG Emission Factor Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub
[11] SCE electricity data was provided by specific customer classes, so the inventory excludes electricity from industrial and agricultural customers. MVU electricity data was only disaggregated by residential and nonresidential classes, so the commercial data in the inventory includes electricity from commercial, industrial, streetlighting, traffic control, and agricultural customers.
[12] California Energy Commission (CEC). Power Source Disclosure Program. Available at: https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure-program.
[13] California Energy Commission (CEC). 2019 Power Content Label: Southern California Edison (2020). Available at: https://www.energy.ca.gov/filebrowser/download/3265.
[14] California Energy Commission (CEC). 2019 Power Content Label: City of Moreno Valley (2020). Available at: https://www.energy.ca.gov/filebrowser/download/3212.
[15] U.S. EPA. GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

Solid Waste

Solid waste emissions in the City of Moreno Valley are primarily driven by methane (CH_4) emissions from the decomposition of landfilled solid waste, specifically organic waste. Combustion from fossil fuels (e.g., compressed natural gas) used in equipment at landfills are accounted for as process emissions in the solid waste sector using solid waste activity data. Activity data, measured in short tons of landfilled solid waste, were obtained from CalRecycle's Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility Report.[16] With no waste characterization study available from the City, all landfilled solid waste was categorized as mixed municipal solid waste (MSW) per guidance from ICLEI's Community Protocol and therefore assigned the mixed MSW emission factor (MT CH_4/short ton of waste) from ICLEI's Community Protocol default parameters (Appendix E - Solid Waste Emission Activities and Sources, Table SW.5).

In 2019, landfill methane emissions made up 99 percent solid waste emissions,[17] with only one percent coming from process emissions.

Wastewater

Wastewater emissions in the City of Moreno Valley are primarily driven by several processing, stationary, and fugitive emissions sources resulting from wastewater treatment at the Moreno Valley Regional Water Reclamation Facility (MVRWRF) and Edgemont Community Services District (ECSD).[18] MVRWRF wastewater emissions sources included anaerobic digestors, process emissions associated with centralized treatment systems, and effluent discharge. ECSD wastewater emissions sources included anaerobic digestors, process emissions associated with centralized treatment systems, effluent discharge, and electricity consumption. With several different emission sources, activity data and emission factors for the wastewater sector vary widely. For the City of Moreno Valley, facility-specific activity data provided by MVRWRF included wastewater influent, population served, digester gas generation and properties, biological oxygen demand of wastewater, and effluent nitrogen load. Due to data availability limitations, ECSD activity data including service population and wastewater influent attributable to the City of Moreno Valley were estimated according to ICLEI's Community Protocol using publicly available data from ECSD's *Sewer Management Plan Update*.[19] Emission factors for MVRWRF and ECSD were sourced from the Community Protocol (Appendix F Wastewater and Water Emission Activities and Sources) Equations WW.1, WW.2, WW.7, WW.12, WW.15.

[16] CalRecycle. Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. Available at: https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility

[17] While some emissions are generated from recycled and diverted organic waste processing (e.g., composting), these emissions are negligible in comparison to landfilled waste methane and therefore not included in the GHG emissions inventory.

[18] Wastewater from the Moreno Valley community is primarily treated by EMWD at the Moreno Valley Regional Water Reclamation Facility (MVRWRF). MVRWRF also treats some small areas of unincorporated Riverside; however, due to data limitations on the division of the plant's service population, all wastewater treatment at the MVRWRF was attributed to the City of Moreno Valley. A small area of the Moreno Valley's wastewater is serviced by Edgemont Community Services District (ECSD). ECSD is contracted with the City of Riverside to treat its district's wastewater at the Riverside Regional Water Quality Control Plant (RRWGCP). Since ECSD also serves portions of the City of Riverside, not all ECSD wastewater emissions are allocated to Moreno Valley. Please refer to the City's Inventory tool for full allocation methodology.

[19] ECSD activity data was attributed to the City of Moreno Valley using land use summary data (acres) for the City of Moreno Valley and City of Riverside within ECSD's service territory.
Edgemont Community Services District (ECSD). Sewer System Management Plan Update (2016). Available at: https://edgemontcsd.specialdistrict.org/files/14d0cfde8/SSMP+Update+November+2022+FINAL.pdf.

In 2019, MVRWRF process nitrous oxide (N_2O) emissions from nitrification/denitrification made up 52 percent of wastewater emissions, followed by 29 percent from MVRWRF effluent discharge, 11 percent from ECSD electricity consumption, five percent from ECSD effluent discharge, two percent from ECSD process N_2O emissions from nitrification/denitrification, one percent from MVRWRF stationary combustion, and less than one percent from ECSD stationary combustion. Since MVRWRF is located within City boundaries, emissions coming from electricity consumption are captured under the building energy sector and therefore excluded from the wastewater sector to avoid double counting.

Water

Water emissions in the City of Moreno Valley are primarily driven by energy use from local and imported water supply infrastructure. This includes electricity use for activities such as groundwater pumping and treatment, water conveyance, and distribution to customers or end-uses. Water activity data can include gallons of total water deliveries or directly measured electricity consumption associated with water supply and irrigation systems. For the City of Moreno Valley, activity data provided by Eastern Municipal Water District (EMWD) included millions of gallons (MG) of annual water consumption broken out by use type, MG of annual recycled water, and EMWD's water supply breakdown.[20] Water energy intensity factors in kWh per MG were used to estimate the electricity use from the water consumption associated with each water supply and electricity emission factors in MT CO_2e per kWh were used to calculate emissions from the estimated electricity usage. For local groundwater from EMWD, a water energy intensity factor from EMWD's Urban Water Management Plan and an electricity emission factor from the CEC's Power Content Label emission factor for SCE were used.[21,22] For EMWD's purchased water, a water energy intensity factor from the Metropolitan Water District of Southern California's (MWD) Urban Water Management Plan and an average electricity emission factor for California's grid from the U.S. EPA's Emissions & Generation Resource Integrated Database (eGRID) were used.[23,24] The City obtains the majority of its water from EWMD, except for a 430-acre area in the western portion of the city that is served by Box Springs Mutual Water Company (BSMWC). Due to data availability limitations, activity data for BSMWC (i.e., million gallons of water consumed) was estimated following ICLEI's Community Protocol (Appendix F Wastewater and Water Emission Activities and Sources) by applying the City of Moreno Valley's average 2019 EMWD water consumption per household to BSMWC's service population and water supply breakdown from BSMWC's website.[25] For BSMWC's purchased water, water energy intensity factors from the MWD's Urban Water Management Plan and Western Municipal Water District's (WMWD) 2020 Urban Water Management Plan along with

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[20] EMWD obtains most of their water from the Metropolitan Water District of Southern California (MWD) who sources water from the State Water Project (SWP) and Colorado River Aqueduct (CRA). The other major source is groundwater from wells within the San Jacinto Groundwater Basin.

[21] Eastern Municipal Water District (EMWD). 2020 Urban Water Management Plan (2021). Available at: https://content.emwd.org/sites/default/files/2024-07/urbanwatermanagementplan_0.pdf.

[22] California Energy Commission (CEC). 2019 Power Content Label: Southern California Edison (2020). Available at: https://www.energy.ca.gov/filebrowser/download/3265.

[23] Metropolitan Water District of Southern California (MWD). 2020 Urban Water Management Plan (2021). Available at: https://www.mwdh2o.com/media/21641/2020-urban-water-management-plan-june-2021.pdf.

[24] U.S. EPA. Emissions & Generation Resource Integrated Database (eGRID). Available at: https://www.epa.gov/egrid/data-explorer.

[25] BSMWC obtains most of their water from Western Municipal Water District (WMWD). The other source is groundwater from "one local groundwater well." WMWD purchases most of their water from MWD, and the other major source being groundwater from wells within the Riverside-Arlington Groundwater Basin.

Box Springs Mutual Water Company (BSMWC). Available at: https://boxspringsmutualwater.org/.

an average electricity emission factor for California's grid from the U.S. EPA's eGRID were used to calculate emissions.[26,27,28]

It is assumed that all EMWD water management processes are outside city boundaries and therefore not already captured under Moreno Valley's building energy sector. It is assumed that BSMWC's groundwater and purchased water distribution activities are inside city boundaries and therefore already captured under Moreno Valley's building energy sector. Recycled water energy use is not calculated as these emissions are negligible by comparison and already captured under the MVRWRF energy sub-sector.

In 2019, emissions associated with EMWD purchased water made up 97 percent of emissions, followed by two percent from EMWD groundwater, and less than one percent from water provided by BSMWC.

Sincerely,
Rincon Consultants, Inc.

Erik Feldman, MS, LEED AP
Principal

Emily Saul, MAS
Sustainability Planner

[26] Metropolitan Water District of Southern California (MWD). 2020 Urban Water Management Plan (2021). Available at: https://www.mwdh2o.com/media/21641/2020-urban-water-management-plan-june-2021.pdf.
[27] Western Municipal Water District (WMWD). 2020 Urban Water Management Plan (2022). Available at: https://westernwaterca.gov/DocumentCenter/View/5739/Western-2020-UWMP-with-Appendices_Revised-20220330?bidId=.
[28] U.S. EPA. Emissions & Generation Resource Integrated Database (eGRID). Available at: https://www.epa.gov/egrid/data-explorer.

APPENDIX C

GREENHOUSE GAS EMISSIONS FORECAST AND REDUCTION TARGETS

Rincon Consultants, Inc.
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213-788-4842

April 22, 2025
Project No: 24-16405

Angelica Frausto-Lupo
Community Development Director, City of Moreno Valley
14177 Frederick Street
Moreno Valley, California 92553
Via email: angelicaf@moval.org

Subject: City of Moreno Valley Community Greenhouse Gas Forecast-Targets Summary–Climate Action Plan Update for the City of Moreno Valley

Dear Ms. Frausto-Lupo:

Rincon Consultants, Inc. (Rincon), a science-based climate and environmental consulting firm, was contracted by the City of Moreno Valley to develop a greenhouse gas (GHG) emissions forecast and targets as part of their Climate Action Plan Update (CAP). This summary provides an overview of the data, methodologies, and results, along with an analysis of findings in communitywide GHG emissions to support Moreno Valley's CAP Update.

California has established Statewide GHG emissions reduction goals to mitigate negative climate change impacts and transition the State to a low-carbon economy. In particular, the State has established goals to reduce Statewide GHG emissions 40 percent below 1990 levels by 2030, as established by Senate Bill (SB) 32 (2016) and achieve net zero GHG emissions as soon as possible, but no later than 2045, as established by Assembly Bill (AB) 1279 (2023).[1] The California Air Resources Board (CARB) is the agency responsible for addressing these goals and developing strategies to achieve them. Local jurisdictions throughout the State are completing local GHG inventories, forecasts, targets, and CAPs to align with SB 32 and AB 1279 and provide their fair share of GHG emissions reduction in support of the State's goals.

Local governments play a fundamental role in reducing local GHG emissions. Local government policies can influence high-emissions behavior and mitigate climate change effects.[2] To this end, Moreno Valley is developing an Updated CAP that aligns with the State's SB 32 and AB 1279 goals. The CAP will include Moreno Valley's 2019 GHG inventory and the associated GHG emissions forecast and targets included in this summary.[3]

Based on the 2019 Community GHG Inventory Summary prepared for Moreno Valley and dated April 21, 2025, GHG emissions levels were forecasted out to 2024,[4] 2030, 2035, 2040, and 2045. The emissions forecast provides an up-to-date projection of how GHG emissions are expected to change for Moreno Valley based on forecasted changes in population and employment, as well as existing State and federal legislation aimed at reducing GHG emissions through 2045. This summary also presents provisional GHG targets and a gap analysis that identifies the level of GHG emissions

[1] AB 1279 defines net zero GHG emissions as reducing GHG emissions at least 85 percent below 1990 levels. California also set a goal to reach 1990 levels by 2020, as established by AB 32, The 2020 goal set by AB 32 was achieved by the State in 2016. CARB. Frequently Asked Questions – California's 2022 Climate Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/2022-06/2022_Scoping_Plan_FAQ_6.21.22.pdf
[2] CARB. California's 2022 Climate Change Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf
[3] City of Moreno Valley. 2019 Community Greenhouse Gas Inventory Summary (April 21, 2025).
[4] 2024 is the baseline year for the Moreno Valley 2024 General Plan Update.

reduction that will need to be achieved through local action to meet the GHG emissions reduction targets.

GHG Forecast

A GHG emissions inventory establishes a reference point for a single year; however, annual GHG emissions change over time due to factors such as population and job growth as well as new technologies and legislation. A GHG emissions forecast estimates future GHG emission changes by accounting for projected community growth and then accounting for GHG emissions reduction expected from currently adopted State energy and climate legislation. This section includes an estimate of the future emissions for Moreno Valley in the years 2024, 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 2019 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, consistent with Moreno Valley 2024 General Plan Update projections.
- **Legislative-adjusted scenario**: Provides a forecast of how currently adopted State legislation would reduce GHG emissions from the business-as-usual scenario. The legislative-adjusted scenario represents the State's contribution to reducing local GHG emissions to meet State 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 and the responsibility of the City for further GHG emissions reduction.

Business-as-usual GHG Forecast Scenario

Future GHG emissions were calculated by multiplying projected activity data with the baseline emission factors utilized in the 2019 community GHG emissions inventory. Several indicator growth rates were developed from 2019 activity data and applied to demographic projections to project future activity data. Demographics applied to the growth factors are based on projected estimates developed for Moreno Valley's 2024 General Plan Update for projected population, employment, vehicle miles traveled (VMT), and households in 2024, 2030 and 2040 and are consistent with Moreno Valley's 6th Cycle (2021-2029) Housing Element Update Sites Inventory Assessment. The employment projections are based on the Western Riverside Council of Government's Riverside County Transportation Model (RIVCOM).[5] Off-road fuel use was projected using data provided in the CARB OFFROAD2021 model.[6] A summary of the demographics and projection metrics for each forecast year in the BAU forecast are provided in Table 1.

[5] Western Riverside Council of Governments. RIVCOM. https://wrcog.us/320/Transportation-Modeling-Services

[6] California Air Resource Board (CARB). 2023. Mobile Source Emissions Inventory Off-road (OFFROAD2021 v1.0.3). Available at: https://arb.ca.gov/emfac/offroad/emissions-inventory/5e0cb7d6006cc10661f4b3ffb9c120a486d46ea6

Table 1 Moreno Valley BAU Forecast Demographic and Projection Metrics by Forecast Year

Metric	Data Source	2019	2024	2030	2035	2040	2045
Population[1]	2024 General Plan Update	176,614	205,620	240,428	269,434	298,440	327,446
Employment[1]	2024 General Plan Update	53,118	65,303	79,925	92,111	104,296	116,481
Service Population	Calculated[2]	229,731	270,923	320,353	361,544	402,736	443,928
Households[1]	2024 General Plan Update	42,482	53,048	65,728	76,294	86,860	97,426
Passenger Annual VMT[3]	2024 General Plan Update	1,511,335,632	1,730,354,950	1,993,178,131	2,212,197,448	2,431,216,766	2,650,236,084
Commercial Annual VMT[3]	2024 General Plan Update	70,144,209	93,292,380	121,070,186	144,218,357	167,366,528	190,514,700
Off-road gasoline usage (gallons)	CARB OFFROAD2021	1,192,668	1,300,911	1,383,318	1,443,478	1,502,122	1,553,145
Off-road diesel usage (gallons)	CARB OFFROAD2021	4,218,527	3,969,789	4,169,666	4,363,463	4,551,821	4,769,789
Off-road natural gas usage (gallons)	CARB OFFROAD2021	245,730	278,031	321,325	363,081	410,392	410,402

Notes: VMT = vehicle miles traveled.

[1] Demographic projection data for 2035 and 2045 are estimated based on a linear interpolation between the 2030 and 2040 data points provided and the assumption that the growth rate remains constant through 2045.

[2] Service population is calculated as the combined total number of employees and residents.

[3] VMT data was provided as a disaggregate weekday total VMT per vehicle class (auto and truck) attributable to Moreno Valley using origin-destination methodology. For passenger (i.e., auto) and commercial (i.e., truck) vehicles, VMT was annualized using CARB's VMT annualization factor (i.e., 347 days per year) to estimate the total VMT. VMT data for 2035 and 2045 are estimated based on a linear interpolation between the 2030 and 2040 data points provided and the assumption that the growth rate remains constant through 2045.

California Air Resources Board (CARB). Climate Change Draft Scoping Plan. Measure Documentation Supplement (page 14). Available at: https://www.arb.ca.gov/cc/scopingplan/document/measure_documentation.pdf

A description of the demographic metrics used to project specific activity data and associated growth factors for each forecasted GHG emission source in the 2019 community GHG emissions inventory are provided in Table 2.

Table 2 Moreno Valley GHG Emission Sources and Growth Factors for BAU Scenario Forecast

GHG Emissions Source	Demographic Projection Metric	Growth Factor	Value	Units
Energy				
Residential Natural Gas Consumption	Households	Natural Gas Consumption per Household	514	therms/household
Nonresidential Natural Gas Consumption	Employment	Natural Gas Consumption per Job	110	therms/job
Residential Electricity Consumption	Households	Electricity Consumption per Household	9,111	kWh/household
Nonresidential Electricity Consumption	Employment	Electricity Consumption per Job	6,080	kWh/job
Transportation				
Passenger Total VMT[1]	N/A	N/A	N/A	N/A
Commercial Total VMT[1]	N/A	N/A	N/A	N/A
Buses Total VMT[2]	Service Population	VMT per Service Person	8	miles/service person
Off-Road Equipment[3]	N/A	N/A	N/A	gallons
Solid Waste				
Solid Waste Disposal	Service Population	Solid Waste Emissions per Service Person	0.70	MT CO_2e/service person
Wastewater				
Wastewater Electricity Consumption	Service Population	Wastewater Electricity Consumption per Service Person	1.95	kWh/service person
Wastewater Process and Fugitive Emissions	Service Population	Wastewater Process and Fugitive Emissions per Service Person	<0.01	MT CO_2e/service person
Water				
Imported Water Supply Electricity Consumption	Service Population	Imported Potable Water Supply Electricity Consumption per Service Person	147	kWh/service person

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; kWh = kilowatt-hour; VMT = vehicle miles traveled; N/A = Not Applicable; Service Population/Service Person = the combined total number of employees and residents in Moreno Valley.

[1] Annual passenger and commercial VMT for each forecast year are obtained from VMT analysis for the 2024 General Plan Update.

[2] Bus VMT projections are calculated because VMT analysis for the 2024 General Plan Update did not include buses.

[3] Off-road fuel consumption for each forecasted year is obtained from the CARB OFFROAD2021 model. https://arb.ca.gov/emfac/offroad/emissions-inventory/1e9a074105b677b748642cf9845d36da67986744

Using the above demographic and projection metrics in Table 1, multiplied by the growth factors in Table 2 and the 2019 community GHG inventory emission factors, the BAU forecast can be calculated. In the BAU forecast, GHG emissions are expected to increase through 2045. A summary of the BAU forecast results by GHG emission sector is provided in Table 3.

Table 3 Moreno Valley BAU Forecast Results Summary by Emission Sector

GHG Emissions Source	2019	2024	2030	2035	2040	2045
Energy	**373,457**	**463,865**	**572,354**	**662,762**	**753,170**	**843,577**
Residential Electricity[1]	100,411	125,379	155,340	180,309	205,277	230,245
Nonresidential Electricity[1]	89,112	109,554	134,085	154,527	174,970	195,412
Residential Natural Gas[2]	145,016	181,085	224,368	260,437	296,506	332,575
Nonresidential Natural Gas[2]	38,919	47,848	58,561	67,490	76,418	85,346
Transportation	**715,352**	**827,048**	**965,906**	**1,081,862**	**1,197,780**	**1,313,660**
Passenger Total VMT	560,656	641,904	739,403	820,652	901,901	983,150
Commercial Total VMT	94,883	126,195	163,770	195,082	226,394	257,707
Buses Total VMT	3,140	3,703	4,378	4,941	5,504	6,067
Off-road Equipment	56,673	55,245	58,354	61,186	63,980	66,736
Solid Waste	**160,875**	**189,721**	**224,336**	**253,181**	**282,026**	**310,872**
Solid Waste Disposal	160,875	189,721	224,336	253,181	282,026	310,872
Wastewater	**889**	**1,048**	**1,240**	**1,399**	**1,558**	**1,718**
Wastewater Process and Fugitive Emissions	792	934	1,104	1,246	1,388	1,530
Wastewater Electricity[1]	97	115	136	153	171	188
Water	**7,020**	**8,279**	**9,789**	**11,048**	**12,306**	**13,565**
Imported Water Supply	7,020	8,279	9,789	11,048	12,306	13,565
Total GHG Emissions	**1,257,593**	**1,489,961**	**1,773,624**	**2,010,251**	**2,246,840**	**2,483,392**

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). Values may not add up to totals due to rounding.

[1,2] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

Legislative-adjusted GHG Forecast Scenario

Several federal and State regulations have been adopted that would reduce Moreno Valley's GHG emissions below the BAU forecasted levels in 2024, 2030, 2035, 2040 and 2045. The impact of these regulations was quantified and incorporated into the adjusted forecast to provide a more accurate depiction of future emissions growth and the GHG emissions reduction responsibility of Moreno Valley. State 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 in the following, as well as a description of why specific legislation was included or excluded from this forecast analysis.

GHG Reduction Legislation and Programs

Additional legislative programs are expected to reduce GHG emissions in specific sectors throughout California, as identified in the 2017 Scoping Plan Update. Many of these programs were incorporated into this forecast analysis and are summarized below.

Transportation Legislation

Advanced Clean Cars Program

In January 2012, the California Air Resources Board (CARB) approved a new emissions-control program (the Advanced Clean Cars program[7]) 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.[8]

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).[9] 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 Trucks was approved by CARB in June 2020 that sets a zero-emission vehicle (ZEV) percent-of-sales requirement on medium- and heavy- duty vehicle manufacturers to promote increased truck ZEV sales from 2024 to 2035.[10] 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.[11] The effects of the ICT regulation on GHG emissions are modeled in EMFAC2021 and are included in this forecast.

Energy Legislation

Title 24

Although it was not originally intended to reduce GHG emissions, California Code of Regulations Title 24, Part 6: California's Building Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24), was adopted in 1978 to reduce Statewide energy consumption, which in turn

[7] California Air Resources Board (CARB). Advanced Clean Cars Program. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program
[8] CARB. 2019. Advanced Clean Cars Summary. https://ww2.arb.ca.gov/sites/default/files/2019-12/acc%20summary-final_ac.pdf
[9] CARB. Advanced Clean Cars II. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii
[10] CARB. Advanced Clean Trucks. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks
[11] CARB. Innovation Clean Transit. https://ww2.arb.ca.gov/our-work/programs/innovative-clean-transit

lowers fossil fuel use and associated GHG emissions.[12] The standards are updated every three years to incorporate new technologies and construction practices.

The adjusted forecast includes estimated energy savings from the 2019 Title 24 Building Energy Efficiency Standards, which became effective January 1, 2020.[13] For residential buildings, the California Energy Commission (CEC) estimated the 2019 standards reduce electricity consumption by 53 percent and natural gas consumption by seven percent relative to the 2016 standards. For nonresidential buildings, the CEC estimated a 30 percent reduction in electricity consumption, while no significant natural gas savings were projected due to limited requirements for commercial gas end uses.[14] These reductions are incorporated into this GHG forecast through 2045.

The 2022 Title 24 standards, adopted in December 2022, include more advanced measures to support building decarbonization; however, at this time the State has not released estimated energy or GHG savings associated with the updated standards.[15] Therefore, to maintain a conservative forecast, the 2022 code updates are not included in the GHG reductions estimated in this analysis.

<u>Renewables Portfolio Standard, Senate Bill 100, & Senate Bill 1020</u>

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 Renewables 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.

Moreno Valley Electric Utility (MVU) and Southern California Edison (SCE) currently provide electricity to Moreno Valley and are subject to RPS requirements. Both MVU and SCE's emission factors, adjusted for RPS requirements, were used to project emissions through 2045. Table 4 provides the estimated electricity emission factors that would result from SB 100 and SB 1020. Weighted residential and nonresidential emission factors were calculated by applying the 2019 electricity consumption shares for each utility to future years, maintaining a constant split in electricity consumption between utilities over time. These weighted emission factors were used for relevant forecasting calculations.

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[12] California Energy Commission (CEC). 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings. https://www.energy.ca.gov/sites/default/files/2022-12/CEC-400-2022-010_CMF.pdf

[13] CEC. 2020. 2019 Building Energy Efficiency Standards. https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency

[14] CEC. 2019 Building Energy Efficiency Standards: Frequently Asked Questions. Accessed at: https://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf.

[15] CEC. 2023. 2022 Building Energy Efficiency Standards. https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency

Table 4 Moreno Valley Forecasted RPS and Electricity Emission Factors

Metric	2019	2024[1]	2030	2035	2040	2045
MVU Renewables Mix	33.4%	45.5%	60%	90%	95%	100%
MVU EF (MT CO_2e/kWh)	0.000285	0.000234	0.000171	0.000043	0.000021	0
SCE Renewables Mix	35.10%	46.4%	60%	90%	95%	100%
SCE EF (MT CO_2e/kWh)	0.000242	0.000200	0.000149	0.000037	0.000019	0
Weighted Residential Renewables Mix[1]	34.92%	46.3%	60%	90%	95%	100%
Weighted Residential EF (MT CO_2e/kWh)[1]	0.000247	0.000203	0.000152	0.000038	0.000019	0
Weighted Nonresidential Renewables Mix[1]	34.47%	46.1%	60%	90%	95%	100%
Weighted Nonresidential EF (MT CO_2e/kWh)[1]	0.000263	0.000216	0.000160	0.000040	0.000020	0

Notes: MVU = Moreno Valley Electric Utility; SCE = Southern California Edison; MT CO_2e = Metric tons of carbon dioxide equivalent; kWh = kilowatt-hour; EF = emission factor.

[1] Renewables mix percentages for 2024 are calculated by interpolating between known renewables mix percentages for 2019 and required renewables mix percentages for 2030 under RPS.

[1] Weighted renewables mix and EFs are calculated as the average of MVU and SCE's renewables mix or EF weighted by the share of electricity provided by each provided in the residential or nonresidential sector in 2019.

Waste Legislation

Assembly Bill 939

In 1989, AB 939 established a mandate for local jurisdictions to divert 50 percent of solid waste from landfills through source reduction, recycling, and composting programs. The bill required each city and county in California to develop and implement a solid waste management plan, marking a significant shift from landfill-focused disposal to integrated waste management. As this mandate was fully implemented by 2000 and is considered a foundational policy rather than a driver of new reductions, no future emissions reductions associated with AB 939 are included in this forecast.

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 Moreno Valley has already implemented an organics collection program, implementation of AB 1826 compliance is reflected in Moreno Valley's 2019 community inventory solid waste activity data and is also included in this forecast.

Senate Bill 1383

In 2016, SB 1383 established a methane emission reduction target for short-lived climate pollutants in various sectors of the economy, including waste. Specifically, SB 1383 established 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.[16] Additionally, SB 1383 required a 20 percent reduction in "current"[17] edible food disposal by 2025. Although SB 1383 was signed into law, compliance with this Senate Bill 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.

Legislative-adjusted Scenario Forecast Results

In the adjusted emissions forecast, the electricity sector experiences a strong downward trend, approaching zero in 2045 due to stringent RPS requirements from SB 100 and SB 1020. Natural gas emissions are expected to continue an upward trajectory until 2045 due to housing and employment growth projections. This trend is partially offset due to the increasingly stringent efficiency requirements for new residential construction from Title 24. Transportation emissions are expected to fluctuate between 2019 and 2045. Existing regulations will reduce GHG emissions until 2025 or 2030, but as these standards yield diminishing returns and VMT increases, the rate of emissions reduction in the transportation sector will slow as 2045 approaches. Wastewater emissions and solid waste emissions are projected to increase through 2045. A detailed summary of the projected GHG emissions under the adjusted forecast by sector and year through 2045 can be found in Table 5.

Table 5 Moreno Valley Legislative-adjusted Scenario Forecast Results

GHG Emissions Source	2019	2024	2030	2035	2040	2045
Energy	**373,457**	**404,213**	**428,976**	**361,800**	**385,318**	**404,791**
Residential Electricity[1,2]	100,411	92,697	77,924	21,318	11,573	0
Nonresidential Electricity[1,2]	89,112	85,109	73,678	20,636	11,426	0
Residential Natural Gas[3]	145,016	178,560	218,813	252,357	285,901	319,445
Nonresidential Natural Gas[3]	38,919	47,848	58,561	67,490	76,418	85,346
Transportation	**715,352**	**758,601**	**780,447**	**802,355**	**846,207**	**906,109**
On-road Passenger Vehicles	560,656	575,603	573,831	584,621	614,935	656,092
On-road Commercial Vehicles	94,883	124,140	144,907	153,458	164,929	181,631
On-road Buses	3,140	3,613	3,355	3,090	2,362	1,650
Off-road Equipment	56,673	55,245	58,354	61,186	63,980	66,736

[16] CalRecycle. California's Short-Lived Climate Pollutant Reduction Strategy. https://calrecycle.ca.gov/organics/slcp/
[17] SB 1383 does not specify a baseline year for the 20 percent food recovery target, however, CalRecycle's 2018 Statewide waste characterization studies will be used to help measure the baseline for the State to meet its SB 1383 goals. https://calrecycle.ca.gov/organics/slcp/faq/foodrecovery/#:~:text=SB%201383%20requires%20the%20state,for%20individual%20jurisdictions%20to%20achieve.

GHG Emissions Source	2019	2024	2030	2035	2040	2045
Solid Waste	**160,875**	**189,721**	**224,336**	**253,181**	**282,026**	**310,872**
Solid Waste Disposal	160,875	189,721	224,336	253,181	282,026	310,872
Wastewater	**889**	**1,027**	**1,183**	**1,268**	**1,400**	**1,530**
Wastewater Process and Fugitive Emissions	792	934	1,104	1,246	1,388	1,530
Wastewater Electricity[1]	97	93	79	22	12	0
Water	**7,020**	**6,724**	**5,744**	**1,621**	**903**	**0**
Imported Water Supply[1]	7,020	6,724	5,744	1,621	903	0
Total GHG Emissions	**1,257,593**	**1,360,285**	**1,440,687**	**1,420,225**	**1,515,855**	**1,623,302**

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). Values may not add up to totals due to rounding.

[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.

[2,3] Electricity and natural gas sectors include emissions from Transmission & Distribution losses and pipeline/end-use leakage, respectively.

Legislative GHG Emissions Reduction Contribution

A summary of the reductions from the BAU forecast that can be expected under the adjusted forecast are provided in Table 6.

Table 6 Summary of Moreno Valley Legislative GHG Emission Reductions

Metric	2024	2030	2035	2040	2045
California RPS	40,573	105,262	259,985	315,695	375,117
Title 24	21,705	47,780	69,946	91,901	113,915
Transportation Legislation (Advanced Clean Cars Program, Pavley Standards, Innovative Clean Transit)	67,398	179,896	260,095	323,390	371,058
Total	**129,676**	**332,937**	**590,026**	**730,986**	**860,091**

Notes: All values are presented in metric tons of carbon dioxide equivalent (MT CO_2e). Values may not add up to totals due to rounding.

Provisional GHG Emissions Targets

GHG reduction targets are used in climate action planning to establish metrics that guide the community's commitment to achieve GHG emissions reductions and help gauge progress reducing GHG emissions over time. California has established Statewide GHG reduction goals for 2030 and 2045, relative to a 1990 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 as a means to limit a community's contribution to a GHG emissions level that would not be cumulatively considerable.[18] Thus, local agencies are recommended to establish 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. CARB has issued several guidance documents concerning the establishment of GHG emission reduction targets for CAPs to comply with California Environmental Quality Act (CEQA) Guidelines section 15183.5(b).[19] CARB also recommends that local targets be a part of the process of developing, monitoring, and updating a CAP.

1990 Level GHG Emissions Back-Cast

Moreno Valley does not have a 1990 GHG emissions inventory against which to develop GHG reduction targets consistent with SB 32. However, 1990 GHG emissions can be estimated for the community relative to Moreno Valley's 2019 inventory using a State-level emissions change metric.

Moreno Valley 1990 GHG emissions have been calculated using the State's 2019 GHG emissions inventory as compared to the State's GHG emissions inventory in 1990 to calculate approximate percent reduction in Moreno Valley between 2019 and 1990. This approach assumes that Moreno Valley communitywide GHG emissions have generally tracked with State GHG emissions over the same timeframe. The calculation is developed using the published Statewide emissions results from CARB[20] after removing emissions from sectors not included in the Moreno Valley inventory (e.g., agriculture,

[18] California Air Resources Board. 2022. California's Climate Change Scoping Plan, p.268. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

[19] Cal. Code Regs. Tit. 14, § 15183.5 - Tiering and Streamlining the Analysis of Greenhouse Gas Emissions https://www.law.cornell.edu/regulations/california/14-CCR-15183.5

[20] CARB. 2023. California GHG Emission Inventory Program. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

aviation, non-specified, industrial). The 1990 GHG emissions back-cast for Moreno Valley is shown in Table 7.

Table 7 Moreno Valley 1990 GHG Emissions Back-Cast Calculations

Calculation Parameter and Unit	Value
2019 Statewide GHG Emissions (MT CO_2e)	275,200,000
1990 Statewide GHG Emissions (MT CO_2e)	306,650,000
2019 to 1990 Statewide GHG Emissions Change (%)	10.26%
2019 Moreno Valley GHG Emissions (MT CO_2e)	1,257,593
1990 Moreno Valley GHG Emissions (MT CO_2e)	1,401,312

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent.

GHG Emissions Reduction Target Setting and Gap Analysis

The purpose of GHG emissions reduction target setting is to develop a trajectory to maintain consistency with the State's goals and limit the community's contribution to climate change. Over the past two decades, California has adopted extensive legislation, policies, and programs to reduce GHG emissions across California, establishing itself as a global leader in climate action. The primary legislation enumerating State climate goals and driving climate action at the State-level is SB 32 and AB 1279. Together these bills set Statewide GHG reduction goals for 2030 and 2045 and chart a path towards a carbon-neutral California.

- ***Senate Bill 32:*** This legislation requires a Statewide reduction in GHG emissions of 40 percent below 1990 levels by 2030. A California Climate Change Scoping Plan was adopted by CARB in 2017 to identify a pathway for the State to achieve this target.
- ***Assembly Bill 1279:*** This legislation codified the Statewide carbon neutrality goal into a legally binding requirement for California to achieve carbon neutrality no later than 2045 and achieve 85 percent of the overall reduction specifically from GHG emissions reduction as part of that goal. The latest California Climate Change Scoping Plan was adopted by CARB in 2022 to identify a pathway for the State to achieve this goal.

CARB guidance recommends local jurisdictions first strive to exceed the SB 32 target of reducing GHG emissions by 40 percent below 1990 levels, while establishing a policy framework to make substantial progress towards the longer-term target of carbon neutrality by 2045. In the 2017 Scoping Plan, CARB also recommends the use of evidence-based local per capita targets based on local emissions sectors and population projections that are consistent with the framework used to develop the Statewide per capita targets. The efficiency metrics (i.e., GHG emissions per capita) recommendations are based on the recognition that California must accommodate population and economic growth and not penalize communities which are growing at significant rates.[21] The 2022 Scoping Plan recommends jurisdictions establish locally appropriate, plan-level targets that align with the trajectory to carbon neutrality and continues to reference GHG reduction using per capita GHG metrics.[22]

Target setting is an iterative process that must be informed by the GHG emissions reductions that can realistically be achieved through the development of feasible GHG reduction measures. As part of the

[21] California Air Resources Board (CARB) (2017). California's 2017 Climate Change Scoping Plan, p. 99-102. Accessed January 2025 at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

[22] California Air Resources Board. 2022. California's Climate Change Scoping Plan, Appendix D – Local Actions, p.13. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

ongoing CAP process, Moreno Valley will develop measures and actions to achieve GHG reductions through regionally applicable and quantifiable strategies. Therefore, targets identified herein should remain provisional until the quantification and analysis of potential GHG reduction measures has been completed. With GHG emissions reduction targets in place, the communitywide GHG emissions reduction gap that Moreno Valley will be responsible for through local action can be calculated. Moreno Valley's GHG emissions reduction gap is based on the difference between the adjusted forecast and the established GHG emission reduction targets.

Table 8 provides a summary of the GHG emission reduction target pathways and gaps. The target pathways were set using efficiency metrics and translated to mass emissions for ease of tracking against the GHG inventory and forecast. Recognizing the significant population and economic growth Moreno Valley is anticipating by 2030, the target pathways have been developed using efficiency metrics (i.e., per capita GHG emissions). This efficiency approach provides emissions reduction efforts that are more scalable for the local context, emphasizing efforts that pace emissions reduction with population and economic growth.

To identify an appropriate target trajectory for Moreno Valley, the following two target pathways have been analyzed:

- SB 32 Efficiency Target Pathway
- AB 1279 Efficiency Target Pathway

The SB 32 Efficiency Target Pathway aligns with SB 32 requirements by reducing Moreno Valley's per capita GHG emissions by 40 percent below 1990 levels in 2030 followed by a straight-line reduction towards net zero per capita emissions between 2030 and 2045. However, due to the significant growth anticipated between 2019 and 2030, this target pathway would allow GHG emissions to exceed forecasted GHG levels in 2030. Thus, limiting the near-term requirement for significant GHG reduction efforts and placing the majority of the community's GHG reduction in the post-2030 timeframe.

The AB 1279 Efficiency Target Pathway reduces per capita GHG emissions in a straight line to net zero per capita emissions in 2045. This target pathway aligns with AB 1279 requirements and exceeds SB 32 requirements. This pathway would result in targeting a 65 percent reduction in per capita GHG emissions below 1990 levels by 2030. The AB 1279 Efficiency Target Pathway provides a steady pathway for GHG emissions reduction in Moreno Valley that paces reduction with growth and makes substantial progress towards carbon neutrality in 2045. Table 8 presents the two evaluated target pathways for Moreno Valley: an SB 32 Efficiency Target Pathway and an AB 1279 Efficiency Target Pathway.

Table 8 Moreno Valley GHG Emissions Reduction Target Pathways and Gap Analysis

Emissions Forecast or Pathway	1990	2019	2024	2030	2035	2040	2045
SB 32 Efficiency Target Pathway Scenario							
Adjusted Forecast (MT CO_2e)	1,401,312	1,257,593	1,360,285	1,440,687	1,420,225	1,515,855	1,623,302
Population	118,779	176,614	205,620	240,428	269,434	298,440	327,446
Per Capita Adjusted Forecast (MT CO_2e/person)	11.80	7.12	6.62	5.99	5.27	5.08	4.96
SB 32 Efficiency Target Pathway in	11.80	7.12	7.10	7.08	4.72	2.36	0

Emissions Forecast or Pathway	1990	2019	2024	2030	2035	2040	2045
Per Capita Emissions (MT CO_2e/person)[1]							
Percent Reduction Below 1990 Per Capita Levels (%)	0%	40%	40%	40%	60%	80%	100%
SB 32 Efficiency Target Pathway in Mass Emissions (MT CO_2e)	1,401,312	1,257,593	1,460,209	1,701,886	1,271,473	704,178	0
Remaining Emissions Reduction Gap (MT CO_2e)[3]	0	0	(99,924)	(261,199)	148,752	811,677	1,623,302
AB 1279 Efficiency Target Pathway Scenario							
Adjusted Forecast (MT CO_2e)	1,401,312	1,257,593	1,360,285	1,440,687	1,420,225	1,515,855	1,623,302
Population	118,779	176,614	205,620	240,428	269,434	298,440	327,446
Per Capita Adjusted Forecast (MT CO_2e/person)	11.80	7.12	6.62	5.99	5.27	5.08	4.96
AB 1279 Efficiency Target Pathway in Per Capita Emissions (MT CO_2e/person)[2]	11.80	7.12	5.75	4.11	2.74	1.37	0
Percent Reduction Below 1990 Per Capita Levels (%)	0%	40%	51%	65%	77%	88%	100%
AB 1279 Efficiency Target Pathway in Mass Emissions (MT CO_2e)	1,401,312	1,257,593	1,182,571	987,683	737,895	408,667	0
Remaining Emissions Reduction Gap (MT CO_2e)[3]	0	0	177,715	453,003	682,330	1,107,188	1,623,302

Notes: MT CO_2e = Metric tons of carbon dioxide equivalent; () denotes a negative value.

Emissions have been rounded to the nearest whole number and therefore sums may not match.

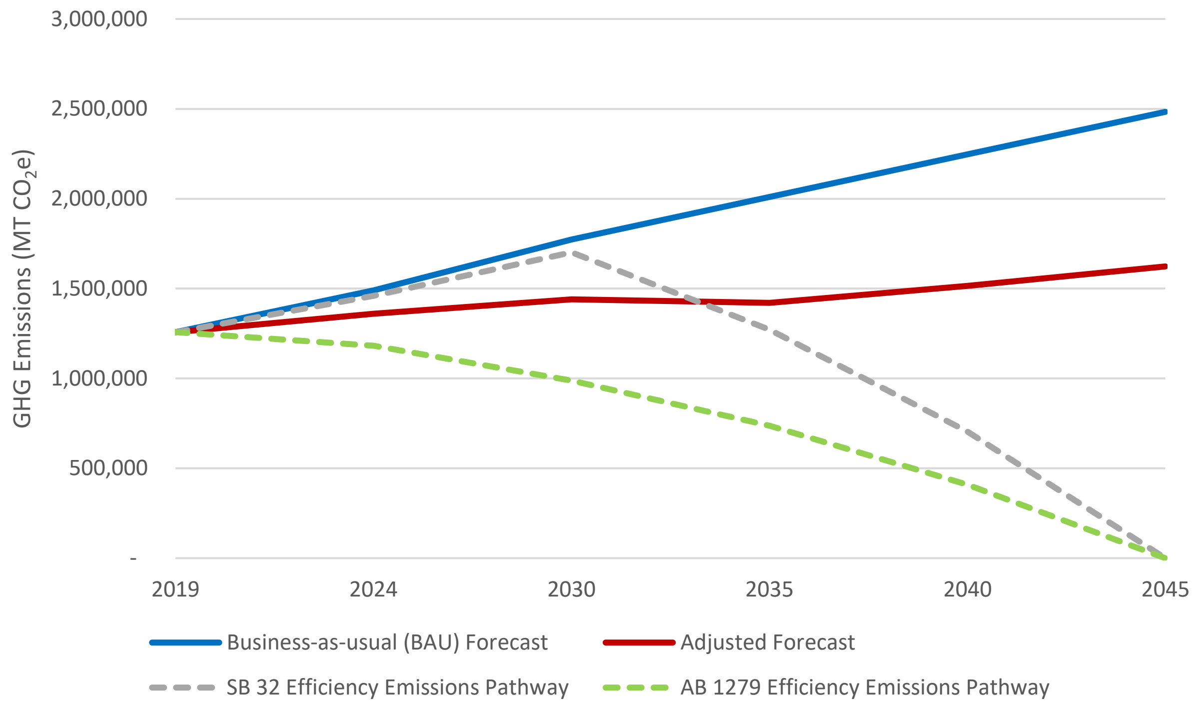
[1] The target pathway is calculated by reducing 1990 per capita emissions by 40 percent in 2030 and to net zero per capita emissions in 2045. This provisional target pathway is consistent with SB 32.

[2] The target pathway is calculated by reducing 2019 per capita emissions in a straight line to net zero per capita emissions in 2045. This provisional target pathway exceeds SB 32 and is consistent with a trajectory set forth to achieve AB 1279.

[3] Remaining emissions reduction gap represents the reductions Moreno Valley would be responsible for through local action. The gap is calculated as the difference between the adjusted forecast and applicable target pathway scenario.

Figure 1 provides a visual representation of Moreno Valley's AB 1279 Efficiency Target Pathway and the remaining gap relative to the forecasted future GHG emissions.

Figure 1 GHG Emissions Forecast and Provisional Target Pathway



As seen in Figure 1, Moreno Valley's resulting GHG emissions reduction pathway displays the reductions needed to be achieved through local action to meet the targets (i.e., the area between the adjusted forecast and GHG emissions reduction target pathway). Based on the analysis above, it appears the AB 1279 Efficiency Target Pathway provides a more consistent pathway for GHG emissions reduction in Moreno Valley that paces reduction with growth and makes substantial progress towards carbon neutrality in 2045.

Sincerely,
Rincon Consultants, Inc.

Erik Feldman, MS, LEED AP
Principal

Emily Saul, MAS
Sustainability Planner

MORENO VALLEY
WHERE DREAMS SOAR

APPENDIX D

GREENHOUSE GAS EMISSIONS REDUCTION TECHNICAL APPENDIX

Moreno Valley Climate Action Plan

Greenhouse Gas Emissions Reduction Technical Appendix

prepared for

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1 Introduction

This technical report presents the quantification and substantial evidence that supports the greenhouse gas (GHG) emissions reduction potential of the Moreno Valley Climate Action Plan (CAP). This report also supports the CAP's classification as a qualified GHG reduction plan. The CAP is the City of Moreno Valley's (Moreno Valley) updated plan to reduce communitywide GHG emissions and address climate change. It includes Measures with numeric targets to reduce GHG emissions and Actions supporting each Measure that Moreno Valley will implement through 2045 to reduce GHG emissions and make substantial progress towards the State's carbon neutrality goal.

Section 15183.5(b)(1) of the California Environmental Quality Act (CEQA) Guidelines establishes several criteria which a plan must meet to be considered a qualified GHG reduction plan and allow for programmatic CEQA streamlining of project GHG emissions. This report details the evidence substantiating the GHG emissions reduction associated with the CAP measures pursuant to Subsection (D) which requires measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified GHG emissions level. This report demonstrates the Measures in the CAP conservatively provide the GHG emissions reduction necessary to meet Moreno Valley's 2030 GHG emissions reduction target, which aligns with the State's GHG emissions reduction goal established by Senate Bill (SB) 32 (2016) and make substantial progress towards Moreno Valley's 2045 target which is consistent with the State's goal established Assembly Bill (AB) 1279 (2023).[1]

Mechanisms to monitor the implementation of the CAP and Moreno Valley's progress toward the GHG emissions reduction targets are included in the CAP, as required in CEQA Guidelines Section 15183.5(b)(e). If the results of the tracking indicate that Moreno Valley is not on track to reach the 2030 GHG emissions reduction specified in this report, the CAP will be updated as a whole, or specific Measures and Actions will be amended to redirect the GHG emissions reduction back in line with the adopted targets. All future CAPs will include new or amended Measures and Actions, with evidence that their implementation can achieve Moreno Valley's 2030 GHG emissions reduction target and make substantial progress towards or achieve Moreno Valley's 2045 target.

1.1 Greenhouse Gas Emissions Reduction Targets

Moreno Valley's GHG emissions reduction targets exceed California's goal to reduce GHG emissions 40 percent below 1990 levels by 2030 (SB 32, 2016) and align with California's goal to achieve carbon neutrality by 2045 (AB 1279, 2023) defined as reducing GHG emissions at least 85 percent below 1990 levels and removing or sequestering the remaining GHG emissions. The City has set targets to contribute their fair share of GHG emissions reduction towards California's goals. Moreno Valley's short- and long-term GHG emissions reduction targets are:

- Reduce per capita GHG emissions by 65 percent below 1990 levels by 2030 (equivalent to reducing GHG emissions to 987,683 MT CO_2e by 2030); and,
- Achieve carbon neutrality by 2045.[2]

[1] SB 32 (2016) established the State goal to reduce GHG emission 40 percent below 1990 levels by 2030. AB 1279 (2023) established the State goal to achieve carbon neutrality by 2045. The State defines carbon neutrality as net zero carbon emissions, which is achieved by reducing GHG emissions at least 85 percent below 1990 levels and removing the remaining emissions.
[2] For additional details on Moreno Valley's GHG emissions reduction targets, see Appendix C of the CAP.

1.2 Measures and Actions Organization

As part of the Moreno Valley CAP development process, the City has developed a comprehensive set of Measures and Actions to reduce communitywide GHG emissions to achieve Moreno Valley's 2030 GHG emissions reduction target and make substantial progress towards Moreno Valley's 2045 target. The Measures are organized around a set of six **Sectors** to reduce GHG emissions. Each **Measure** is then supported by a set of **Actions**. The structure of the Strategies, Measures, and Actions are as follows:

- **Sectors**: Sectors define the GHG emissions category in which the GHG reduction will occur. The sectors align with the GHG inventory which details the community emissions associated with the same specific sectors.
- **Measures**: Measures are developed under each sector and identify measurable emphasis and metrics to reduce GHG emissions within the sector. Measures are developed pursuant to the community GHG Inventory and Forecast and in line with the U.S. Community Protocol and the California Air Resources Board (CARB) 2022 Climate Change Scoping Plan to achieve carbon neutrality.
- **Actions**: Actions identify the programs, policies, funding pathways, and other specific commitments that will be implemented within the region to achieve the established measures. Each measure contains a suite of actions, which together have been designed to accomplish the measure goal and metrics.

The Measures and Actions can be either quantitative or supportive, defined as follows:

- **Quantitative**: Quantitative measures and actions result in a quantifiable GHG emissions reduction when implemented. A GHG emissions reduction from these measures and actions are supported by case studies, scientific articles, calculations, or other third-party substantial evidence.
- **Supportive**: Supportive measures and actions may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction. However, due to one of several factors – including a low GHG emissions reduction effect, indirect GHG emissions reduction benefit, or potential for double-counting – such measures will not be quantified and do not contribute directly to the expected GHG emissions reduction target and consistency with the State goals. For example, municipal-specific measures are not quantified, as they represent a subset of communitywide emissions and as such could be characterized as double-counting. Despite not being quantified, supportive measures/actions are nevertheless critical to the overall success of the CAP and provide support so that the quantitative measures and actions will be successfully implemented.

This report identifies both the quantitative and supportive Measures and provides a complete description of their contribution to achieving Moreno Valley's 2030 GHG emissions reduction target and making substantial progress towards Moreno Valley's 2045 target. This report, however, only details the quantitative Actions that enable each Measure. The supportive Actions are excluded from this report because they do not contribute directly to achieving and making progress towards Moreno Valley's GHG emissions reduction targets. Detail on these supportive Actions can be found in the CAP.

1.3 Greenhouse Gas Emissions Reduction

Table 1 summarizes the Measures and the GHG emissions reduction Moreno Valley would achieve in 2030 and 2045 upon the implementation of the Measures and Actions.

Table 1 Moreno Valley CAP GHG Emissions Reduction Summary by Measure

Measure ID	Measure Text	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy C: Cornerstone to Climate Action Planning			
C-1	Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along the SR-60 corridor to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with the California Air Resources Board's Advanced Clean Fleets regulation.	Supportive	Supportive
Strategy BE: Building Energy			
BE-1	Procure or offset 70% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.	13,399	0[1]
BE-2	Decarbonize new residential construction by at least 95% by 2026.	19,522	121,094
BE-3	Decarbonize new nonresidential construction by at least 95% by 2026.	5,106	32,231
BE-4	Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% by 2030 and 31% by 2045.	11,305	134,341
BE-5	Decarbonize existing nonresidential buildings to reduce existing nonresidential natural gas consumption by 3.8% by 2030 and 18% by 2045.	1,645	24,125
BE-6	Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.	Supportive	Supportive
Strategy T: Transportation			
T-1	Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.	2,352	6,079
T-2	Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.	9,767	59,435
T-3	Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce commuter vehicle miles traveled.	61,426	125,963
T-4	Achieve zero-emission vehicle adoption rates of 31% for passenger vehicles and 19% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.	111,067	646,245
T-5	Implement programs to support CARB and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.	18,335	38,918
Strategy SW: Solid Waste			
SW-1	Achieve, monitor, and maintain SB 1383 (2016) requirements to reduce waste sent to landfills by 75% below 2014 levels by 2030.	195,661	282,198
Strategy WW: Water and Wastewater			
WW-1	Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.	Supportive	Supportive

Measure ID	Measure Text	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy CS: Carbon Sequestration			
CS-1	Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve SB 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.	4,424	6,025
CS-2	Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.	106	1,487
Total		**454,115**	**1,478,141**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

[1] SB 100 (2018) 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_2e per kilowatt-hour (kWh), resulting in no additional reductions beyond the State-mandated baseline.

Together, the Measures and Actions in the CAP provide Moreno Valley with the GHG emissions reduction necessary to achieve their 2030 GHG emissions reduction target (see Table 2). This report provides the evidence and quantification that substantiates the 2030 GHG emissions reduction. However, the 2045 GHG emissions reduction estimated in this report is not currently enough to meet Moreno Valley's 2045 target of carbon neutrality. Achieving carbon neutrality will require new technologies, new State regulations, and additional Measures and Actions that incorporate lessons learned from implementing the Measures and Actions of this CAP. Future CAP updates will account for these emerging technologies and new State regulations and include new Measures and Actions that the City will implement to close the remaining gap to achieve carbon neutrality.

Table 2 Moreno Valley's GHG Emissions Reduction Pathway

GHG Emissions Scenario	2030 GHG Emissions [MT CO_2e]	2045 GHG Emissions [MT CO_2e]
Projected GHG Emissions (Adjusted Forecast)[1]	1,440,687	1,623,302
GHG Emissions Reduction from Measure Implementation	454,115	1,478,141
GHG Emissions Remaining[2]	986,572	145,161
GHG Emissions Reduction Target Pathway[3]	987,683	0
Remaining GHG Emissions Reduction Gap[4]	(1,111)	145,161
Target anticipated to be met?	**Yes**	**No**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Numeric numbers denoted in parentheses represent negative numbers. Values may not add up to totals due to rounding.

[1] See CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets for more information on the adjusted forecast.

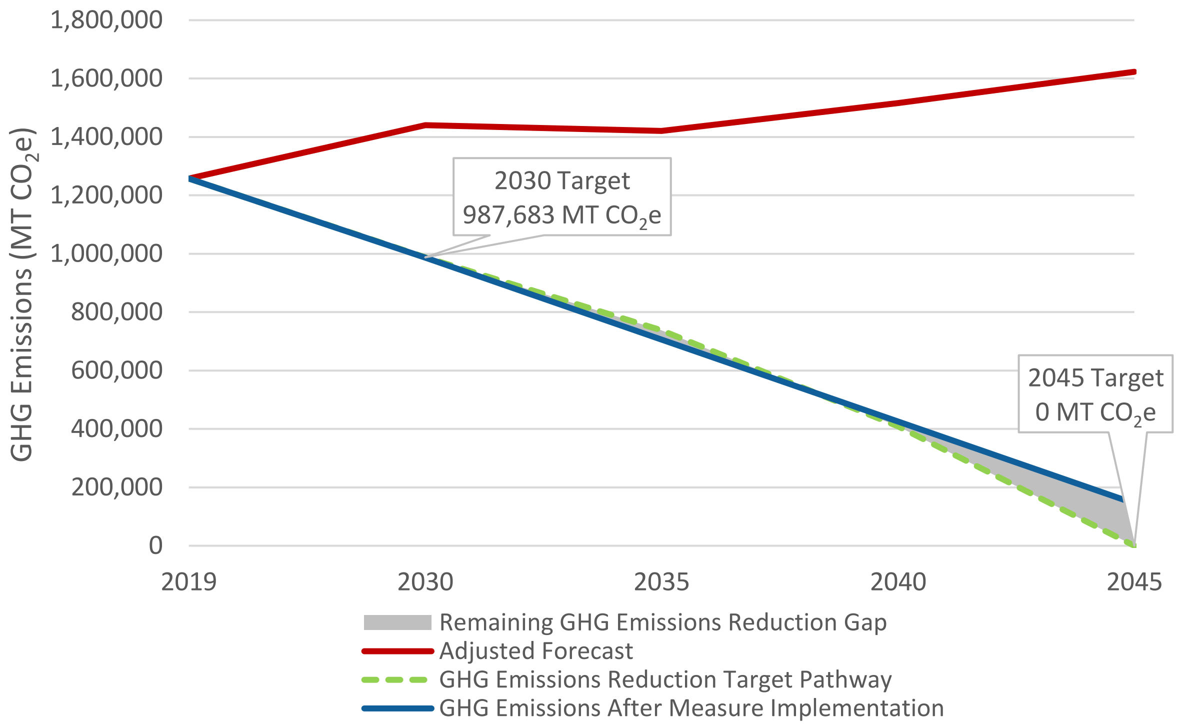
[2] GHG Emissions Remaining reflects the subtraction of GHG Emissions Reduction from Measure Implementation from Projected GHG Emissions.

[3] The 2030 GHG emissions reduction target (i.e., 987,683 MT CO_2e) is equivalent to reducing per capita GHG emissions by 65 percent below 1990 levels.

[4] Remaining GHG Emissions Reduction Gap reflects the difference between GHG Emissions Reduction Target and the GHG Emissions Remaining after measure implementation. Negative values signify that measures achieve GHG reductions beyond the set GHG target.

Figure 1 shows Moreno Valley's GHG emissions reduction targets in relation to Moreno Valley's GHG emissions after implementation of the Measures and Actions included in the CAP. A complete description of each Measure and the quantitative Actions is included in the remainder of the report.

Figure 1 Moreno Valley's GHG Emissions Reduction Pathway



2 Strategy C: Cornerstone to Climate Action Planning

Table 3 Strategy C: Cornerstone to Climate Action Planning GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy C: Cornerstone to Climate Action Planning			
C-1	Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along the SR-60 corridor to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with the California Air Resources Board's Advanced Clean Fleets regulation.	Supportive	Supportive
Total		**0**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent.

C-1 (supportive): Build off the California Transportation Commission's Clean Freight Corridor Efficiency Assessment to facilitate the development of medium- and heavy-duty zero-emission vehicle refueling depots along the SR-60 corridor to meet the growing demand of medium- and heavy-duty freight transport and help facilitate the decarbonization goals associated with the California Air Resources Board's Advanced Clean Fleets regulation.

Measure C-1 aims to facilitate the development of medium- and heavy-duty (MDHD) zero-emission vehicle (ZEV) refueling depots along the SR-60 corridor in Moreno Valley, supporting CARB's Advanced Clean Fleets regulation. These depots will provide essential infrastructure for the growing demand for MDHD freight transport and advance the City's decarbonization goals.

The Measure includes Actions such as conducting a site-specific feasibility study to identify optimal locations, assess utility infrastructure, and forecast future ZEV refueling demand. It also outlines funding strategies through programs like Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES),[3] the California Energy Commission's Clean Transportation Program,[4] and CARB's Low Carbon Fuel Standard,[5] ensuring the City can secure resources to develop this infrastructure.

To support project implementation, Measure C-1 emphasizes partnerships with regional agencies, utilities, and private-sector stakeholders, such as the Southern California Association of Governments (SCAG), the South Coast Air Quality Management District (AQMD), the Riverside County Transportation Commission (RCTC), and ZEV truck manufacturers. The Measure also incorporates equity considerations by engaging community-based organizations (CBOs) to gather public feedback and educate residents on the public health benefits of ZEV adoption.

Additionally, the Measure directs the City to streamline permitting processes by adopting a zoning ordinance aligned with AB 1236 (2015), AB 970 (2021), and SB 1418 (2024), designating Zero-Emission Vehicle Refueling Zones near key freight corridors and establishing zoning guidelines to mitigate potential environmental impacts. Lastly, workforce development is a key focus, with plans to collaborate with Moreno Valley College and local businesses to train technicians for ZEV charging and fueling infrastructure.

While Measure C-1 will play a crucial role in accelerating the adoption of MDHD ZEVs and supporting grid decarbonization, its GHG emissions reductions are *not quantified* in this CAP. This is due to the complexity of estimating emissions reductions tied to refueling infrastructure, which depend on variables like fleet transition timelines and energy source availability. Nonetheless, the Measure indirectly supports the development of local green jobs and industry, other transportation electrification efforts, and contributes to long-term carbon neutrality.

[3] ARCHES H2. Unlashing American Energy Innovation, Security, and Leadership. Accessed at: https://archesh2.org/

[4] California Energy Commission (CEC). Clean Transportation Program. Accessed at: https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program

[5] California Air Resources Board (CARB). Low Carbon Fuel Standard. Accessed at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard

3 Strategy BE: Building Energy

Table 4 Strategy BE: Building Energy GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy BE: Building Energy			
BE-1	Procure or offset 70% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.	13,399	0[1]
BE-2	Decarbonize new residential construction by at least 95% by 2026.	19,522	121,094
BE-3	Decarbonize new nonresidential construction by at least 95% by 2026.	5,106	32,231
BE-4	Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% by 2030 and 31% by 2045.	11,305	134,341
BE-5	Decarbonize existing nonresidential buildings to reduce existing nonresidential natural gas consumption by 3.8% by 2030 and 18% by 2045.	1,645	24,125
BE-6	Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.	Supportive	Supportive
Total		**50,976**	**311,791**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

[1] SB 100 (2018) 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_2e per kilowatt-hour (kWh), resulting in no additional reductions beyond the State-mandated baseline.

BE-1: Procure 70% of Moreno Valley Electric Utility electricity from renewable energy sources by 2030 and 100% of electricity from renewable energy sources by 2045.

Measure BE-1 aims to increase Moreno Valley Electric Utility's (MVU) share of renewable electricity such that 70 percent of electricity is procured from or offset with renewable energy sources by 2030, and 100 percent by 2045. The primary Actions that enable this Measure are:

- **Action BE-1a** which directs the City to conduct comprehensive electric infrastructure and capacity studies to assess the long-term viability of transitioning MVU to 100 percent renewable energy by 2045. These studies will include:
    - Creating an Integrated Resource Plan (IRP) to meet Moreno Valley's future energy needs and renewable energy targets through 2045; developing an energy and demand forecast; exploring various generation resources such as local and remote renewable generation sites, energy storage solutions, microgrids, Renewable Energy Credits (RECs), and the development of virtual power plants; and,
    - Formalizing a long-term electric capital improvement plan, focusing on the infrastructure improvements necessary to meet the anticipated increase in renewable energy generation and distribution; and,
- **Action BE-1c** which directs the City to develop a resolution to adopt **Action BE-1's** IRP to exceed the requirements of SB 100 (2018) and SB 1020 (2022) by 2030 where 70 percent of the electricity mix is sourced from a combination of eligible renewable sources, carbon-free sources, and/or offset with RECs.

To monitor progress towards the City's renewable energy goals, the City will track completion of the IRP and long-term electric capital improvement plan identified in **Action BE-1a** which will aid in planning procurement and offset schedules to meet the 2030 and 2045 renewable energy goals. The City will also track the percent renewable content of their utility electricity mix, which is required to be reported to the California Energy Commission (CEC) annually, as the primary performance standard for this measure. The following subsection details the methodology, assumptions and calculations used to substantiate MVU's target emission factor by 2030 and the estimated reduction in GHG emissions resulting from the implementation of **Action BE-1c**.

Action BE-1c Substantiation – Renewable Energy Procurement

ASSERTION

The resolution developed under **Action BE-1c** will adopt **Action BE-1a**'s IRP to exceed SB 100 (2018) and SB 1020 (2022) requirements where 70 percent of the electricity is sourced from a combination of eligible renewable sources, carbon-free sources, and/or offset with RECs. This increase in renewable energy will decrease MVU's projected 2030 electricity emissions factor by 25 percent. Since MVU supplies about ten percent of residential electricity and 37 percent of nonresidential electricity consumed in Moreno Valley, this decrease will result in an estimated 18 percent decrease in residential electricity GHG emissions and an estimated 25 percent decrease in nonresidential electricity GHG emissions in 2030.

EVIDENCE

MVU is an independent utility that procures, offsets, and sells electricity for its customers. As such, MVU must meet SB 100 (2018) and SB 1020 (2022)'s annual renewable energy targets (also known as Renewable Portfolio Standard, RPS) and has the agency to exceed the targets, if desired. Many independent utilities and Community Choice Aggregations (CCAs) across California, such as the City of Healdsburg, City of Riverside and San Diego Clean Power, have demonstrated the feasibility of exceeding annual RPS requirements. In 2020, RPS requirements mandated 33 percent of electricity retail sales be from eligible renewable sources. Yet in 2022, these utilities and CCAs exceeded RPS requirements by achieving renewable energy mixes up to 54.2 percent for their base or standard rates while also providing their customer base with a 100 percent eligible renewable option.[6,7,8] Utilities and CCAs that have successfully exceeded RPS requirements have done so by developing IRPs to guide procurement and offset planning, developing long-term electric capital improvement plans to guide investment decisions, and adopting resolutions to solidify renewable energy targets.

Measure BE-1 includes similar strategies that MVU will employ to exceed the SB 100 (2018) requirement to source 70 percent of electricity retail sales from eligible renewable energy sources by 2030. Through **Action BE-1c,** MVU will adopt **Action BE-1a**'s IRP to exceed SB 100 (2018) and SB 1020 (2022) requirements where 70 percent of the electricity is sourced from a combination of eligible renewable sources, carbon-free sources, and/or offset with RECs. The IRP will identify the electricity sources, RECs, and costing needed to achieve the renewable energy target by 2030.

An electricity mix of 70 percent eligible renewable energy will decrease the GHG emissions from MVU electricity consumption in Moreno Valley. An increase to 70 percent will decrease MVU's 2030 emissions factor by 25 percent. Since MVU supplies about ten percent of the residential electricity and 37 percent of the nonresidential electricity consumed in Moreno Valley,[9] this decrease will result in an estimated 18 percent decrease in residential electricity GHG emissions and an estimated 25 percent decrease in nonresidential electricity GHG emissions in 2030. These decreased GHG emissions factors are applied to forecasted electricity consumption including the increase in electricity consumption expected from the electrification under Measures BE-2, BE-3, BE-4, BE-5, and T-4 to calculate the GHG emissions reduction. The equations used to quantify this action are detailed in Equations 1 through 1.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 12 and Table 13 in Section 8.

[6] California Energy Commission (CEC). City of Healdsburg 2022 Power Content Label. Accessed at: https://www.energy.ca.gov/filebrowser/download/6011
[7] CEC. Riverside Public Utilities 2022 Power Content Label. Accessed at: https://www.energy.ca.gov/filebrowser/download/6018
[8] CEC. San Diego Clean Power 2022 Power Content Label. Accessed at: https://www.energy.ca.gov/filebrowser/download/6063
[9] Calculated from the 2019 community GHG emissions inventory. The split between MVU electricity and Southern California Edison electricity is assumed constant through 2045 except that all new buildings are under MVU.

BE-2: Decarbonize new residential construction by at least 95% by 2026.

Measure BE-2 commits Moreno Valley to decarbonize new residential construction in the community. The primary Action that enables this Measure is:

- **Action BE-2b** which directs the City to adopt a single margin source energy score to decarbonize at least 95 percent of new residential construction by 2026 and establish a robust permitting compliance program to enforce the ordinance by streamlining the compliance process, training enforcement staff, and including regular inspections and penalties for non-compliance.[10]

To assess the effectiveness in reducing GHG emissions, following local adoption in 2026 the City will monitor compliance through the permitting program and monitor the annual number of new residential building permits achieving the single margin source energy score. The City will update the ordinance as needed during each review cycle (every three years). The following subsection details the methodology, assumptions and calculations used to substantiate the estimated reduction in residential natural gas consumption resulting from the implementation of **Action BE-2b**.

Action BE-2b Substantiation – Single Margin Source Energy Score

ASSERTION

The ordinance adopted under **Action BE-2b** (i.e., the single margin source energy score) establishes a low Energy Design Rating (EDR)—a scoring metric used to assess a building's energy efficiency or GHG emissions—for new residential buildings of all energy types in Moreno Valley. Due to technology cost-effectiveness, in general a low EDR in a new building can be more cost effectively achieved through an all-electric build rather than mixed-fuel build. Due to cost-effectiveness of all-electric new residential construction and the expected increase in compliance through the implementation of a permitting compliance program, it is expected that 95 percent of new residential construction after 2026 will be built all-electric.

EVIDENCE

The ordinance under **Action BE-2b** will establish and set an EDR at a level that requires high energy efficiency or low GHG emissions, which strongly encourages electrification of new residential construction as the most cost-effective option. This approach is supported by a clear understanding of key developer considerations in new building design. For example, developers prioritize cost efficiency, as the financial feasibility of a project depends heavily on material and energy costs.[11,12] Because electric appliances are energy efficient and Moreno Valley's electricity is less GHG intensive than natural gas, all-electric buildings become the most cost-effective option to comply with the ordinance. To build with natural gas, developers would need to employ additional measures or design features (i.e., additional costs) to meet the EDR, discouraging mixed-fuel construction. Cities across California including Brisbane, Burlingame, Cupertino, East Palo Alto, Encinitas, Palo Alto,

[10] Action BE-2b also directs the City to include major residential renovations under the single margin source energy score by 2026. Detailed substantiation for this aspect of the Action is provided in Measure BE-4's Action BE-2b Substantiation – Significant Residential Remodels.

[11] DesignHorizons Team. 2024. Construction Pricing: Factors, Costs, and Methods Explained. Accessed at: https://designhorizons.org/construction-pricing-factors-costs-and-methods-explained/

[12] Construction Management Association of America. Member Communications Experience, Construction Estimating: Everything You Need to Know. Accessed at: https://www.cmaanet.org/sites/default/files/resource/Construction%20Estimating_0.pdf

Santa Cruz, and Santa Monica have adopted similar ordinances in 2023 and 2024 for single-family and multi-family buildings.[13]

The permitting compliance program established under **Action BE-2b** streamlines compliance processes, trains enforcement staff, and implements regular inspections with penalties for non-compliance. The streamlining, training, and inspections will increase the accuracy of developers' scores while the penalties will increase the likelihood that developers will build all-electric homes to avoid financial and procedural setbacks. The presence of this program as well as the conspicuous nature of new construction reinforces the cost signals of the ordinance and lends to the high likelihood that all new residential construction will comply with the ordinance.

Despite the high likelihood for full compliance, this Measure conservatively assumes 95 percent of new residential buildings will be all-electric post 2026. This assumption accounts for the possibility that new residential buildings may face technological or infrastructural barriers to electrification. However, the City's recent approval of the Aquabella Specific Plan Amendment Project, which includes the construction of 15,000 all-electric housing units from 2026 to 2036, demonstrates the technological and infrastructural feasibility of this Measure and shows that developers in Moreno Valley are willing and able to construct all-electric residential buildings.[14] The City will monitor compliance with the ordinance and adjust the EDR and permitting compliance program as needed to maintain at least a 95 percent compliance rate.

The quantification applies the 95 percent electrification rate to forecasted residential building growth to calculate the GHG emissions reduction from avoided natural gas consumption. The emissions reduction from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease to zero over time. The equations used to quantify this action are detailed in Equations 2 through 2.3 and details regarding assumptions, parameters, and calculation results are detailed in Table 14 and Table 15 in Section 8.

[13] California Energy Commission. Local Ordinances Exceeding the 2022 Energy Code. Accessed at: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-0.

[14] Moreno Valley approved the Aquabella Specific Plan Amendment Project in December 2024 which stipulates all project-related residential development shall use all-electric appliances and end uses including heating, ventilation, and air conditioning; water heating; and induction cooking.

City of Moreno Valley. Draft Subsequent Environmental Impact Report: Aquabella Specific Plan Amendment Project (May 2024). Accessed at: https://moval.gov/cdd/pdfs/projects/aquabella/Draft%20EIR.pdf

BE-3: Decarbonize new nonresidential construction by at least 95% by 2026.

Measure BE-3 commits Moreno Valley to decarbonize new nonresidential construction in the community. The primary Action that enables this Measure is:

- **Action BE-3b** which directs the City to adopt a single margin source energy score to decarbonize at least 95 percent of new nonresidential construction (i.e., commercial and industrial buildings including warehouses) by 2026. As part of the decarbonization legislation, include the following:
  - Require developers of new nonresidential projects to submit infeasibility waivers if full electrification is not currently possible (due to technology constraints), enforcing a rigorous review process to validate these exemptions;
  - Mandate that any new nonresidential building deemed infeasible for full electrification must exceed Title 24 energy efficiency standards and be pre-wired and prepared for future electrification;
  - Incorporate flexibility in compliance paths, allowing businesses to choose cost-effective decarbonization strategies, such as investing in energy-efficient technologies or participating in MVU's or SCE's renewable energy programs;
  - Develop a robust permitting compliance program to enforce the ordinance by streamlining the compliance process, training enforcement staff, and including regular inspections and penalties for non-compliance; and,
  - Require regular review of and updates (at least every three years) to the ordinance to keep pace with technological advancements and market trends.

To assess its effectiveness in reducing GHG emissions following local adoption in 2026, the City will monitor compliance through the permitting program and monitor the annual number of new nonresidential building permits achieving the single margin source energy score through electrification. The City will update the ordinance as needed during each review cycle (every three years). The following subsection details the methodology, assumptions and calculations used to substantiate the estimated reduction in nonresidential natural gas consumption resulting from the implementation of **Action BE-3b**.

Action BE-3b Substantiation – Single Margin Source Energy Score

ASSERTION

The ordinance adopted under **Action BE-3b** establishes a low EDR—a scoring metric used to assess a building's energy efficiency or GHG emissions—for new nonresidential buildings of all energy types in Moreno Valley. Due to the cost-effectiveness of all-electric new nonresidential construction under the ordinance, the rigorous infeasibility review process and requirements, and the expected increase in compliance through the implementation of a permitting compliance program, at least 95 percent of new nonresidential construction will be built all-electric starting in 2026.

EVIDENCE

The ordinance under **Action BE-3b** will establish and set an EDR at a level that requires high energy efficiency or low GHG emissions, which strongly encourages electrification of new nonresidential construction as the most cost-effective option. This approach is supported by a clear understanding of key developer considerations in new building design and purchasing. For example, developers prioritize cost efficiency, as the financial feasibility of a project depends heavily on material and energy costs.[15,16] Because electric appliances are energy efficient and Moreno Valley's electricity is less GHG intensive than natural gas, all electric buildings become the most cost-effective option to comply with the ordinance. To build with natural gas, developers would need to employ additional measures or design features (i.e., additional costs) to meet the EDR, discouraging mixed-fuel construction. Cities across California including Brisbane, Burlingame, Cupertino, East Palo Alto, Palo Alto, Santa Cruz, and Santa Monica have adopted similar ordinances in 2023 and 2024 for nonresidential buildings.[17]

The permitting compliance program established under **Action BE-3b** streamlines compliance processes, trains enforcement staff, and implements regular inspections with penalties for non-compliance. The streamlining, training, and inspections will increase the accuracy of developers' scores while the penalties will increase the likelihood that developers will build all-electric buildings to avoid financial and procedural setbacks. The reach code will also require that any non-electric developments must provide robust justification for infeasibility to be reviewed on a case-by-case basis by the City, further supporting the development of electric nonresidential buildings.[18] If deemed infeasible by the City, the development must exceed Title 24 energy efficiency standards and complete pre-wiring to prepare for future electrification. The presence of the compliance program and the requirement of infeasibility waivers, as well as the conspicuous nature of new construction, reinforce the cost signals of the ordinance and lend to the high likelihood that all new nonresidential construction will comply with the ordinance.

Despite the high likelihood for full compliance, this Measure conservatively assumes 95 percent of new nonresidential buildings will be all-electric post 2026. This assumption accounts for new nonresidential buildings that may face technological or infrastructural barriers to electrification, as accounted for through the infeasibility waiver process outlined in **Action BE-3b**. The City will monitor compliance with the ordinance and adjust the EDR, permitting compliance program, and infeasibility waiver requirements as needed to maintain at least a 95 percent compliance rate.

The quantification applies this electrification rate to forecasted nonresidential building growth to calculate the GHG emissions reduction from avoided natural gas consumption. The emissions reduction from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease over time. The equations used to quantify this action are detailed in Equations 2 through 2.3 and details regarding assumptions, parameters, and calculation results are detailed in Table 14 and Table 15 in Section 8.

[15] DesignHorizons Team. 2024. Construction Pricing: Factors, Costs, and Methods Explained. Accessed at: https://designhorizons.org/construction-pricing-factors-costs-and-methods-explained/

[16] Construction Management Association of America. Member Communications Experience, Construction Estimating: Everything You Need to Know. Accessed at: https://www.cmaanet.org/sites/default/files/resource/Construction%20Estimating_0.pdf

[17] California Energy Commission. Local Ordinances Exceeding the 2022 Energy Code. Accessed at: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency-0.

[18] A reach code is a local or regional building code that goes beyond minimum Statewide or national energy efficiency requirements. Reach codes set higher standards to drive increased energy efficiency, reduce carbon emissions, and promote sustainable building practices.

BE-4: Decarbonize existing residential buildings to reduce existing residential natural gas consumption by 7% below baseline by 2030 and 31% by 2045.

Measure BE-4 puts Moreno Valley on a path to reduce existing residential natural gas consumption 7 percent by 2030 and 31 percent by 2045 to reduce GHG emissions. The primary Actions that enable this level of adoption include:

- **Action BE-4b** which commits the City to develop and adopt a reach code requiring all new residential central air conditioning unit installations and replacements be two-way, providing both heating and cooling with a single unit for residential buildings, by 2026; directs the City to enforce compliance with the reach code through a permitting compliance program; and directs the City to monitor the effectiveness of the reach code and revise during each update cycle as needed to meet the decarbonization goal;
- **Action BE-2b**[19] which commits the City to include significant residential remodels in the single margin source energy score ordinance by 2026;
- **Action BE-4c** which directs the City to continue providing GREEN MoVal programs to MVU customers and technical assistance for residential building retrofits, and expand the programs to focus incentives and technical assistance on panel upgrades, heat pump water heater replacements, and heat pump heating, ventilation, and air conditioning (HVAC) installations to support existing residential building electrification;
- **Action BE-4g** which directs the City to continue to educate MVU residents on MVU's GREEN MoVal programs to support and fund existing building electrification, and SCE residents on SCE's Charge Ready Home program for electrical panel upgrades.

To assess its effectiveness in reducing GHG emissions, the City will monitor compliance with the reach code adopted through **Action BE-4b** through the permitting program and monitor impact through changes in residential natural gas consumption over time. The City will update the reach code as needed during each review cycle (every three years). The following subsections detail the methodology, assumptions, and calculations used to substantiate the estimated reduction in residential natural gas consumption resulting from the implementation of **Action BE-4b** and **Action BE-2b**.

Action BE-4b Substantiation – Two-way Air Conditioning Reach Code and Permitting Compliance Program

ASSERTION

The reach code established under **Action BE-4b** affects the replacement of natural gas furnaces with electric heat pumps in 59 percent of existing residential buildings. Due to the expected increase in compliance through the implementation of a permitting compliance program, it is assumed that 88 percent of the impacted residential buildings will replace their furnaces with heat pumps, resulting in an estimated 3.8 percent reduction in natural gas consumption by 2030.

EVIDENCE

The reach code requires all new central air conditioning installations and replacements to be two-way, providing both heating and cooling through a single unit. Because heat pumps are the only

[19] While Action BE-2b is part of Measure BE-2, its requirement to include significant residential remodels under the single margin energy score ordinance supports Measure BE-4 and is addressed under Measure BE-4's subsection.

technology that provide two-way heating and cooling, requiring all central air conditioning replacements to be two-way makes heat pump adoption the most likely option. In homes that currently have both a central air conditioning unit and a natural gas furnace, replacing the air conditioning unit with a heat pump eliminates the need for the gas furnace, directly reducing natural gas consumption from the furnace. Agencies including Peninsula Clean Energy and Silicon Valley Clean Energy are encouraging this type of reach code as a solution for existing residential building electrification.[20] According to the U.S. Census Bureau's 2023 American Housing Survey, in the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (MSA), 59 percent of homes have central air conditioning and gas furnaces.[21] These homes in Moreno Valley will be affected by the reach code once their central air conditioning units need replacement.

The replacement rate is driven by the schedule of central air conditioning units reaching the end of their useful life. The average lifespan of residential air conditioning units is approximately 22 years.[22] As reliable information regarding the age of distribution of air conditioning units in the community is not readily available, it is assumed that there is a uniform distribution of air conditioning units in the community. This means that approximately one in every 22 air conditioners are expected to retire every year (just over 4.5 percent). With the reach code taking effect in 2026, there are four years until 2030. This time frame means approximately 19 percent of central air conditioning systems will need to be replaced. Since only 59 percent of all residential buildings have central air conditioning units and are subject to the reach code (i.e., they have both central air conditioning units and gas furnaces), it is conservatively estimated that 11 percent (i.e., 19 percent of 59 percent) of central air conditioning units and gas furnaces will be replaced by heat pumps by 2030.

The effectiveness of this measure is strengthened by the permitting compliance program. This program addresses a common challenge faced by jurisdictions—unpermitted HVAC replacements. Studies show that typically only eight to 30 percent of HVAC installations are permitted, limiting the enforceability of reach codes.[23] However, jurisdictions that implement well-funded permitting compliance programs—such as those that streamline the permitting process, provide staff training, enforce noncompliance penalties and secure ample funding—have demonstrated the ability to achieve up to 90 percent compliance with building energy codes.[24,25] Because Moreno Valley is committed to secure funding and develop a robust permitting compliance program with the same strategies—streamlined permitting, staff training, and noncompliance penalties—it is assumed Moreno Valley will achieve the demonstrated 90 percent compliance rate. To remain conservative, however, this quantification applies an 88 percent compliance rate with the reach code. The City will monitor permit numbers to estimate compliance rates and adjust the permit compliance program strategies as needed to achieve at least an 88 percent compliance rate with the reach

[20] Bay Area Reach Codes. Existing Buildings. Accessed at: https://bayareareachcodes.org/model-reach-codes/#:~:text=AC%20to%20Heat%20Pump,of%20designated%20energy%20efficiency%20measures.

[21] U.S. Census Bureau. American Housing Survey: 2023 Riverside-San Bernardino-Ontario MSA. Accessed at: https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=40140&s_year=2023&s_tablename=TABLE3&s_bygroup1=1&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1

[22] Energy Information Administration (EIA). Updated Buildings Sector Appliance and Equipment Costs and Efficiencies (2023). Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[23] California Public Utilities Commission (CPUC). Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report (2017). Accessed at: http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

[24] Meres, Ryan et al. American Council for an Energy-Efficient Economy (ACEEE). Successful Strategies for Improving Compliance with Building Energy Codes (2012). Accessed at: https://www.aceee.org/files/proceedings/2012/data/papers/0193-000112.pdf

[25] Institute for Market Transformation. "$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes." Accessed at: https://www.energy.gov/gc/articles/microsoft-word-energy-code-enforcement-funding-task-force-fact-sheet-finaldocx#:~:text=Strong%20building%20energy%20codes%20are,codes%20the%20most%20severely%20underfunded

code. This compliance rate in conjunction with the anticipated 11 percent of homes that are expected to need central air conditioning replacements by 2030 means that about ten percent of all residential buildings are expected to transition to heat pumps by 2030.

Because heat pump air conditioners eliminate the need for the gas furnace, these replacements will offset the use of natural gas. About 39 percent of residential natural gas consumption is used for space heating in California.[26] Applying this usage rate to forecasted residential natural gas consumption and the ten percent of residential buildings transitioning to heat pumps means about 3.8 percent of total residential natural gas usage will be reduced. This estimation excludes the reduction in residential natural gas due to new building electrification to avoid double counting. The emission reductions from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease over time. The equations used to quantify this action are detailed in Equations 3 through 3.5 and details regarding assumptions, parameters, and calculation results are detailed in Table 16 and Table 17 in Section 8.

Action BE-2b Substantiation – Significant Residential Remodels Reach Code and Permitting Compliance Program

ASSERTION

Under Measure BE-4, **Action BE-2b** expands the single margin source energy score for new residential construction to include the one percent of significant residential remodels occurring annually starting in 2026. Given the cost-effectiveness of all-electric residential significant remodels under the ordinance and the expected increase in compliance through the permitting compliance program established under **Action BE-2b**, it is assumed that 88 percent of the residential buildings undergoing significant remodels annually will be remodeled with electric appliances, resulting in an estimated 3.3 percent reduction in natural gas consumption by 2030.

EVIDENCE

The ordinance under **Action BE-2b** establishes an EDR that encourages energy-efficient appliances, of which electrification is the most cost-effective option. Starting in 2026, the ordinance will be expanded to include significant residential remodels.[27]

The quantification assumes one percent of residential buildings in Moreno Valley will undergo significant remodels annually based on the age of Moreno Valley's housing stock. According to the studies conducted by the Harvard Joint Center for Housing Studies (JCHS), about 14 percent of homes in Moreno Valley's metropolitan statistical area (MSA) (i.e., the Riverside-San Bernardino-Ontario MSA) completed replacement projects (including water heater and HVAC replacements) in 2021. Likewise, the studies show about nine percent of homes in Moreno Valley's MSA completed discretionary projects (including kitchen remodels, bathroom remodels, and room additions) in 2021.[28] Because not all of these home improvement projects can be classified as a significant remodel, the quantification analyses Moreno Valley's housing stock to develop a conservative

[26] Hopkins, Asa S. et al. Decarbonization of Heating Energy Use in California Buildings (2018). Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

[27] The California Building Code, Title 24, defines significant remodels (i.e., substantial improvements) as "Any repair, reconstruction, rehabilitation, alteration, addition, or other improvement of a building structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started." Moreno Valley may adopt its own definition of significant remodels in the reach code.

[28] Project percentages calculated from JCHS' publicly available Excel data for the 2023 *Improving America's Housing* report. JCHS. Improving Americas Housing 2023. Accessed at: https://www.jchs.harvard.edu/improving-americas-housing-2023

estimate for the significant remodel rate. As shown in Table 5, about 14 percent of single-family homes and about 13 percent of multi-family units (i.e., 14 percent of total units) were built before 1978. By 2030, these homes will be at least 53 years old, aligning with the average lifespan of a house (i.e., 50 to 63 years) when significant remodels typically occur.[29] This quantification conservatively assumes one percent of homes will undergo significant remodels each year through 2045. This assumption results in an estimated 3.9 percent of homes receiving significant remodels between 2026 and 2030, well within the 14 percent of homes that may need significant remodels by 2030.

Table 5 Moreno Valley's Housing Stock Age

Year Built	Age in 2030 (years)	Total Housing Units	Share of Housing Units (%)
Single-family Units			
Built after 2006	24 or younger	6,552	13.5%
Built 1992 to 2005	38 to 25	8,420	17.4%
Built 1978 to 1991	52 to 39	26,837	55.3%
Built before 1978	53 or older	6,719	13.8%
Multi-family Units			
Built after 2006	24 or younger	1,572	22.8%
Built 1992 to 2005	38 to 25	1,764	25.6%
Built 1978 to 1991	52 to 39	2,640	38.3%
Built before 1978	53 or older	912	13.2%
Total Housing Units			
Built after 2006	24 or younger	8,124	14.7%
Built 1992 to 2005	38 to 25	10,184	18.4%
Built 1978 to 1991	52 to 39	29,477	53.2%
Built before 1978	53 or older	7,631	13.8%

Note: Percentages may not add up to 100 percent due to rounding.

Source: California Energy Codes & Standards. Cost Effectiveness Explorer (May 2024). Accessed at: https://explorer.localenergycodes.com/jurisdiction/moreno-valley-city/study-results/10-SCE?only_study_type=existing-buildings

For the EDR under **Action BE-2b**, electric appliances are generally the most straightforward and cost-effective pathway for compliance due to the energy efficiency of electric appliances, low GHG-intensity of Moreno Valley's electricity compared to natural gas, and developers' dependence on material and energy costs.[30,31] For more detailed evidence on this assertion, see the Single Margin Source Energy Score subsection under Measure BE-2's section. Although the ordinance does not ban natural gas appliances outright, the cost-effectiveness of electrification under the ordinance—combined with available incentives—suggests that most significant remodels will opt for electric alternatives. Available incentives include federal programs like the Home Electrification and

[29] MIT Architecture. Architectural Longevity: What Determines a Building's Lifespan? (2023). Accessed at: https://architecture.mit.edu/news/architectural-longevity-what-determines-buildings-lifespan#:~:text=Courtesy%20of%20the%20artists.&text=The%20average%20lifespan%20of%20a,years%2C%20from%20construction%20to%20demolition.

[30] DesignHorizons Team. 2024. Construction Pricing: Factors, Costs, and Methods Explained. Accessed at: https://designhorizons.org/construction-pricing-factors-costs-and-methods-explained/

[31] Construction Management Association of America. Member Communications Experience, Construction Estimating: Everything You Need to Know. Accessed at: https://www.cmaanet.org/sites/default/files/resource/Construction%20Estimating_0.pdf

Appliance Rebate Program (HEAR),[32] and then Energy Efficient Home Improvement Credit.[33] Additionally, California offers the California Electric Homes Program (CalEHP),[34] and the California Energy-Smart Homes Program.[35] Locally, GREEN MoVal's programs offer financial support for residential energy efficiency upgrades and electrification projects.[36]

Given the ordinance's requirements and the cost-effectiveness of electrification, the analysis conservatively assumes that 88 percent of homes undergoing significant remodels will transition to electric appliances, while 12 percent will retain gas appliances despite these favorable conditions. This estimate also reflects the anticipated effectiveness of the permitting compliance program established under **Action Be-2b**, which will support increased appliance permits and provide accurate EDR calculations, further encouraging electrification in significant residential remodels. While studies show that only eight to 30 percent of HVAC installations are typically permitted—limiting the effectiveness of reach codes—jurisdictions with robust, well-funded compliance programs have achieved up to 90 percent compliance.[37,38,39] With Moreno Valley's commitment to securing funding, training staff, streamlining permitting, and enforcing penalties for noncompliance, it is assumed Moreno Valley will achieve the demonstrated 90 percent compliance rate. This quantification, however, conservatively applies an 88 percent compliance rate. The City will monitor permit numbers to estimate compliance rates and adjust the permit compliance program strategies as needed to achieve at least an 88 percent compliance rate with the ordinance.

The quantification methodology applies the 88 percent compliance rate to the annual significant remodel rate. This estimation results in about 3.5 percent of homes undergoing all-electric significant remodels by 2030. This percentage is applied to Moreno Valley's forecasted natural gas consumption from existing homes to estimate the resulting natural gas usage reduction. Once a home undergoes a significant remodel, its associated natural gas consumption is removed from the forecast to prevent double counting. The quantification also assumes the reduction in residential natural gas consumption occurs after the implementation of the two-way air conditioning reach code and new building electrification to avoid double counting. Based on these factors, the quantification estimates a 3.3 percent reduction in natural gas consumption from existing residential buildings by 2030. The emission reductions from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease

[32] Rebates from the HEAR Program remain uncertain at the time of this report's preparation. On January 20, 2025, Executive Order 14082—issued as part of a broader directive titled "Unleashing American Energy"—halted the disbursement of funds from the Inflation Reduction Act, including the HEAR Program. The future of implementation remains unclear as states and organizations pursue legal and administrative avenues to challenge the Executive Order.
Energy Star. Home Electrification and Appliances Rebate Program. Accessed at: https://www.energystar.gov/partner-resources/state-and-tribal-rebate-programs/hear-program#:~:text=The%20Home%20Electrification%20and%20Appliances%20Rebate%20%28HEAR%29%20Program,income%20less%20than%20150%25%20of%20the%20area%20median.

[33] Internal Revenue Service. Energy Efficient Home Improvement Credit. Accessed at: https://www.irs.gov/credits-deductions/energy-efficient-home-improvement-credit

[34] California Energy Commission. California Electric Homes Program – CalEHP. Accessed at: https://www.energy.ca.gov/programs-and-topics/programs/california-electric-homes-program-calehp

[35] California Energy-Smart Homes. Alteration. Accessed at: https://caenergysmarthomes.com/alterations/#alteration-incentives

[36] The City of Moreno Valley. GREEN MoVal. Accessed at: https://moval.gov/green/index.html

[37] California Public Utilities Commission (CPUC). Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report (2017). Accessed at: http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

[38] Meres, Ryan et al. American Council for an Energy-Efficient Economy (ACEEE). Successful Strategies for Improving Compliance with Building Energy Codes (2012). Accessed at: https://www.aceee.org/files/proceedings/2012/data/papers/0193-000112.pdf

[39] Institute for Market Transformation. "$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes." Accessed at: https://www.energy.gov/gc/articles/microsoft-word-energy-code-enforcement-funding-task-force-fact-sheet-finaldocx#:~:text=Strong%20building%20energy%20codes%20are,codes%20the%20most%20severely%20underfunded

over time. The equations used to quantify this action are detailed in Equations 4 through 4.3 and details regarding assumptions, parameters, and calculation results are detailed in Table 18 and Table 19 in Section 8.

Action BE-4c and Action BE-4g Substantiation: Electric Water Heater Replacements

ASSERTION

Continued implementation and expansion of the City's GREEN MoVal programs under **Actions BE-4c** as well as continued education on the availability of the City's GREEN MoVal programs and SCE's Demand Response programs under **Action BE-4g** support the replacement of residential gas water heaters with electric water heaters at the end of the gas units' useful life. It is assumed voluntary replacements will follow recent California market trends such that 12 percent of water heater replacements will be electric through 2030. This level of replacements will result in an estimated 0.0028 percent reduction in natural gas consumption by 2030.

EVIDENCE

Actions BE-4c's GREEN MoVal programs will support the voluntary replacement of residential gas water heaters with electric alternatives through incentives and direct technical assistance. The City's GREEN MoVal programs provide MVU customers with incentives and technical assistance to upgrade to energy-efficient electric appliances through the Appliance Rebate Program —which offers rebates for qualifying electric appliances—and the Direct Install Program—which provides free installation of energy-saving devices and equipment for income-qualified households. The City will expand the programs to focus on heat pump water heater replacements and panel upgrades to support residential building electrification. Currently, MVU reports that their GREEN MoVal's Appliance Rebate Program and Direct Install Program have a four percent participation rate.[40] **Action BE-4g** will help increase this participation rate through education and outreach. Targeted education and outreach programs can increase the likelihood of consumer adoption of energy related technologies, including energy efficiency solutions.[41] Additionally, awareness of available programs can result in upwards of 59 percent participation in energy efficiency programs, with potential for increased participation with programs tailored to address the availability of financial resources, long-term benefits, and instructions for easy installation.[42]

Participation in Moreno Valley's GREEN MoVal and SCE's Demand Response Programs for Homes,[43] Residential Direct Install and Energy Savings Assistance (ESA) programs,[44] will support the voluntary shift towards electric appliances seen in the California market. These programs provide incentives and technical assistance for upgrading water heaters. In California, electric water heaters increased from a six percent market share in 2009 to 12 percent in 2019.[45] These trends are expected to continue through 2030 due to rising gas utility rates and the availability of funding for electric or

[40] City of Moreno Valley. Efficiency Programs. Accessed at: https://moval.gov/mvu/efficiency-progs.html#res
[41] Andolfi, Laura and Ortega, Boris. 2024. Smart Choices: The Influence of Energy Literacy on Energy Technology Adoption. Accessed at: https://www.energy-proceedings.org/wp-content/uploads/icae2024/1732537915.pdf
[42] American Council for an Energy-Efficient Economy (ACEEE). Marketing and Promoting Electrification Using Behavioral Science: Results from a National Survey. Accessed at: https://www.aceee.org/research-report/b2406
[43] Southern California Edison (SCE). Demand Response Programs for Homes. Accessed at: https://www.sce.com/residential/demand-response
[44] SCE. Energy Savings Assistance Program. Accessed at: https://www.sce.com/residential/assistance/energy-saving-program
[45] Opinion Dynamics. California Heat Pump Residential Market Characterization and Baseline Study (2022). Accessed at: https://pda.energydataweb.com/#!/documents/2625/view

heat pump water heating appliances in Moreno Valley.[46] While funding levels may fluctuate with sunset dates and budget cycles, current federal, State, regional, and local incentives help offset the upfront costs of electric appliances, further boosting cost-effectiveness.[47] Given current participation trends in GREEN MoVal, the expected impact of expanded education and outreach efforts, and broader California market trends, it is reasonable to assume that Moreno Valley will align with the Statewide 12 percent market share for electric water heater replacements.

The quantification applies this market share rate to the share of water heaters needing replacement by 2030. The replacement rate is driven by the schedule of water heaters reaching the end of their useful life. The average lifespan of residential water heaters is approximately 13 years.[48] As reliable information regarding the age of distribution of water heaters in the community is not readily available, it is assumed that there is a uniform distribution of water heaters in the community. This means that approximately one in every 13 water heaters are expected to retire every year (about 7.7 percent). With **Actions BE-4c** and **BE-4g**'s expected implementation to begin in 2026, there are four years until 2030. This time frame means approximately 31 percent of water heaters will need to be replaced by 2030. Applying the market share rate to these replacements means about four percent of water heaters will be replaced with heat pumps (i.e., 31 percent of 12 percent).

About 38 percent of residential natural gas consumption is used for water heating.[49] Applying this usage rate to forecasted residential natural gas consumption and the four percent of residential buildings transitioning to heat pumps means about 0.0028 percent of total residential natural gas usage will be reduced through voluntary water heater replacements. This estimation excludes the reduction in residential natural gas due to new building electrification to avoid double counting. The emissions reduction from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease over time. Progress toward this action will be monitored through the uptake of Moreno Valley's GREEN MoVal programs, building permit data, and trends in residential natural gas usage. The equations used to quantify this action are detailed in Equations 5 through 5.5 and details regarding assumptions, parameters, and calculation results are detailed in Table 20 and Table 21 in Section 8.

Measure BE-4 Residential Natural Gas Reduction Summary

Moreno Valley is projected to achieve its 2030 goal of reducing residential natural gas consumption by 7 percent. This will be accomplished through **Action BE-4b**'s two-way air conditioning reach code, which is expected to achieve a 3.8 percent reduction, and **Action BE-2b**'s significant remodels ordinance, contributing a 3.3 percent reduction. Additionally, **Action BE-4c** and **BE-4g**'s water heater market trends will provide a 0.0028 percent reduction. Together, these Actions meet the Measure

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[46] The California Energy Commission assumes gas utility rates will experience steep increases starting in 2030 under the 2025 building code.

[47] Current federal funding includes the High Efficiency Electric Home Rebate (HEEHRA), Homeowner Managing Energy Savings (HOMES) Rebate, and rebates and tax credits from the Inflation Reduction Act. Funding from this federal act remains uncertain at the time of this report's preparation. On January 20, 2025, Executive Order 14082 halted the disbursement of funds from the Inflation Reduction Act. The future of implementation remains unclear as states and organizations pursue legal and administrative avenues to challenge the Executive Order. Current State funding includes rebates from TEHC Clean California. Current local funding includes incentives through Moreno Valley's GREEN MoVal program and SCE's Charge Ready Home program.

[48] Energy Information Administration (EIA). Updated Buildings Sector Appliance and Equipment Costs and Efficiencies (2023). Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[49] Hopkins, Asa S. et al. Decarbonization of Heating Energy Use in California Buildings (2018). Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

target of a 7 percent decrease in residential natural gas consumption by 2030. Table 6 outlines the reductions associated with each action, along with the total projected decrease.

These Actions, combined with existing market trends and available incentives, will further support Moreno Valley's efforts to reduce natural gas consumption in existing residential buildings by 2030.

Table 6 Total Existing Residential Building Electrification Summary

Action	2030 Therms Reduced	Percent Reduction
Significant Residential Remodels	793,371	3.3%
Two-way Air Conditioning Reach Code	901,955	3.8%
Electric Water Heater Replacements	660	0.0028%
Total	**1,695,985**	**7.1%**

Note: Values and percentages may not add up to totals due to rounding.

BE-5: Decarbonize existing nonresidential buildings to reduce existing nonresidential natural gas consumption by 3.8% by 2030 and 18% by 2045.

Measure BE-5 puts Moreno Valley on a path to reduce existing nonresidential natural gas consumption 3.8 percent by 2030 and 18 percent by 2045 to reduce GHG emissions. The primary Actions that enable this level of adoption include:

- **Action BE-5b** which commits the City to develop and adopt a reach code requiring all new nonresidential central air conditioning unit installations and replacements be two-way, providing both heating and cooling for a single unit for nonresidential buildings, by 2026; directs the City to enforce compliance with the ordinance through a permitting compliance program; and directs the City to monitor the effectiveness of the reach code and revise during each update cycle as needed to meet the decarbonization goal;
- **Action BE-5c** which directs the City to continue providing GREEN MoVal programs to MVU customers and technical assistance for nonresidential building retrofits, and expand the programs to focus incentives and technical assistance on panel upgrades, heat pump water heater replacements, and heat pump HVAC installations to support existing nonresidential building electrification;
- **Action BE-5d** which commits the City to facilitate access to funding and incentives for nonresidential building owners aiming to electrify and businesses aiming to decarbonize their operations (funding sources include CARB, the Inflation Reduction Act, and the Infrastructure Investment and Jobs Act)[50]; and,
- **Action BE-5e** which directs the City to launch an outreach campaign to promote existing nonresidential building decarbonization, that includes targeted outreach to businesses, contractors, property managers, and building owners highlighting the benefits of, available funding for, and available technical assistance for existing nonresidential building electrification; promoting MVU's Energy Load Program; encouraging enrollment in SCE's Demand Response programs.

To assess its effectiveness in reducing GHG emissions, the City will monitor compliance with the reach code through the permitting program and monitor the impact through changes in nonresidential natural gas consumption over time. The City will update the reach code as needed during each review cycle. The following subsections detail the methodology, assumptions, and calculations used to substantiate the estimated reduction in nonresidential natural gas consumption resulting from the implementation of **Action BE-5b**.

Action BE-5b Substantiation – Two-way Air Conditioning Reach Code and Permitting Compliance Program

ASSERTION

The reach code established under **Action BE-5b** affects the replacement of natural gas furnaces with electric heat pumps in 59 percent of existing nonresidential buildings. Additionally, based on supportive evidence it is anticipated that the permitting compliance program will result in an 88

[50] Funding from these federal acts remains uncertain at the time of this report's preparation. On January 20, 2025, Executive Order 14082—issued as part of a broader directive titled "Unleashing American Energy"—halted the disbursement of funds from both the Inflation Reduction Act and the Infrastructure Investment and Jobs Act. The future of implementation remains unclear as states and organizations pursue legal and administrative avenues to challenge the Executive Order.

percent compliance rate for the replacement of natural gas furnaces with heat pumps, resulting in an estimated 3.8 percent reduction in natural gas consumption by 2030.

EVIDENCE

Action BE-5b's two-way central air conditioning reach code will work to require the electrification of central air conditioning replacements in Moreno Valley's nonresidential buildings beginning in 2026. Agencies including Peninsula Clean Energy and Silicon Valley Clean Energy are encouraging this type of reach code as a solution for existing nonresidential building electrification.[51] The reach code will apply to nonresidential buildings with central air conditioning units. Despite Statewide and regional surveys showing that a greater share of nonresidential buildings have central air conditioning than residential buildings,[52,53] the quantification conservatively assumes that nonresidential and residential buildings in Moreno Valley have the same central air conditioning saturation rate (i.e., 59 percent).[54] The quantification assumes that gas furnaces will be replaced by heat pumps under the reach code since heat pumps are currently the only technology that provide two-way heating and cooling. For more detailed evidence on this assertion, see the Two-way Air Conditioning Reach Code and Permitting Compliance Program subsection under Measure BE-4's section.

The replacement rate is driven by the schedule of central air conditioning units reaching the end of their useful life. With an average lifespan of approximately 23 years and four years of reach code implementation (between 2026 and 2030), approximately 17 percent of nonresidential central air conditioning systems will need to be replaced by 2030.[55] Since it is assumed only 59 percent of all nonresidential buildings have central air conditioning units, it is conservatively estimated that ten percent (i.e., 17 percent of 59 percent) of central air conditioning units and gas furnaces will be replaced by heat pumps by 2030.

This reach code will be enforced through the same permit compliance program as the residential reach code (**Action BE-4b**), employing permit streamlining and advanced staff training to improve permit compliance. While studies show that only eight to 30 percent of HVAC installations are typically permitted—limiting the effectiveness of reach codes—jurisdictions with robust, well-funded compliance programs have achieved up to 90 percent compliance.[56,57,58] With Moreno Valley's commitment to securing funding, training staff, streamlining permitting, and enforcing penalties for noncompliance, it is assumed Moreno Valley will achieve the demonstrated 90 percent

[51] Bay Area Reach Codes. Existing Buildings. Accessed at: https://bayareareachcodes.org/model-reach-codes/#:~:text=AC%20to%20Heat%20Pump,of%20designated%20energy%20efficiency%20measures.

[52] Markley, John et al. University of California, Davis. HVAC Equipment Demographics and Capacity Analysis Tools Applicable to Multi-tenant Light Commercial Buildings (2013). Accessed at: https://wcec.ucdavis.edu/wp-content/uploads/2013/12/MTLC-Preliminary-Report.pdf#:~:text=Packaged%20cooling%20equipment%20serves%20nearly%2070%%20of,HVAC%20systems%20(or%20RTUs)%20ubiquitous%20in%20Multi%2D

[53] U.S. Census Bureau. American Housing Survey: 2023 Riverside-San Bernardino-Ontario MSA. Accessed at: https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=40140&s_year=2023&s_tablename=TABLE3&s_bygroup1=1&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1

[54] Moreno Valley belongs to the U.S. Census Bureau's Riverside-San Bernardino-Ontario MSA. Ibid.

[55] Energy Information Administration (EIA). Updated Buildings Sector Appliance and Equipment Costs and Efficiencies (2023). Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[56] California Public Utilities Commission (CPUC). Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report (2017). Accessed at: http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

[57] Meres, Ryan et al. American Council for an Energy-Efficient Economy (ACEEE). Successful Strategies for Improving Compliance with Building Energy Codes (2012). Accessed at: https://www.aceee.org/files/proceedings/2012/data/papers/0193-000112.pdf

[58] Institute for Market Transformation. "$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes." Accessed at: https://www.energy.gov/gc/articles/microsoft-word-energy-code-enforcement-funding-task-force-fact-sheet-finaldocx#:~:text=Strong%20building%20energy%20codes%20are,codes%20the%20most%20severely%20underfunded

compliance rate. This quantification, however, conservatively applies an 88 percent compliance rate. The City will monitor permit numbers to estimate compliance rates and adjust the permit compliance program strategies as needed to achieve at least an 88 percent compliance rate with the nonresidential reach code. This compliance rate in conjunction with the anticipated ten percent of buildings that are expected to need central air conditioning replacements by 2030 means that about nine percent of all nonresidential buildings are expected to transition to heat pumps for space heating by 2030.

Because heat pump air conditioners eliminate the need for the gas furnace, these replacements will offset the use of natural gas. The quantification applies this resulting replacement rate to the share of natural gas consumed by existing nonresidential buildings for space heating. About 41.7 percent of nonresidential natural gas consumption is used for space heating in California.[59] Applying this usage rate to forecasted nonresidential natural gas consumption and the nine percent of nonresidential buildings transitioning to heat pumps means about 3.8 percent of total nonresidential natural gas usage will be reduced. This estimation excludes the reduction in nonresidential natural gas due to new building electrification to avoid double counting. The emission reductions from natural gas use are slightly offset by the increased emissions from additional electricity consumption required to power electric appliances. However, as the electricity grid continues to decarbonize, these emissions impacts will decrease over time. The equations used to quantify this action are detailed in Equations 3 through 3.5 and details regarding assumptions, parameters, and calculation results are detailed in Table 16 and Table 17 in Section 8.

Action BE-2b Substantiation – Significant Nonresidential Remodels Reach Code and Permitting Compliance Program

Although nonresidential remodels are not included in the quantification of **Action BE-2b**, they will be subject to the reach code established under this Action. Moreno Valley's nonresidential building stock is relatively young compared to its residential stock, with many commercial buildings not yet reaching the typical age for significant remodels. As such, the quantification conservatively excludes nonresidential remodels due to their lower anticipated frequency by 2030. However, when significant nonresidential remodels do occur, they will be required to comply with the reach code, encouraging electrification through the established EDR. Nonresidential remodels taking place in the City will contribute to the community's broader building electrification efforts, even if their impact is not explicitly quantified at this time.

Action BE-5c and Action BE-5e Substantiation: Electric Water Heater Replacements

ASSERTION

Continued implementation and expansion of the City's GREEN MoVal programs under **Actions BE-5c** as well as continued education on the availability of the City's GREEN MoVal programs and SCE's Demand Response programs under **Action BE-5e** will support the voluntary replacement of nonresidential gas water heaters with electric water heaters at the end of the gas units' useful life. Supported voluntary replacements are anticipated follow recent California market trends such that 12 percent of water heater replacements will be electric. These replacements will result in an estimated 0.0023 percent reduction in natural gas consumption by 2030.

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[59] Hopkins, Asa S. et al. Decarbonization of Heating Energy Use in California Buildings (2018). Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

EVIDENCE

The City's GREEN MoVal programs provide incentives and technical assistance for upgrading to energy-efficient electric appliances. These programs, including the Appliance Rebate Program and the Direct Install Program, are being expanded to focus on heat pump water heater replacements and panel upgrades. While current participation in these programs is at four percent, outreach under **Action BE-5e** will help increase this participation rate, as discussed in Measure BE-4's Action BE-4c and Action BE-4g Substantiation: Electric Water Heater section, where targeted education and awareness efforts have been shown to drive higher participation rates.[60,61]

Participation in Moreno Valley's GREEN MoVal and SCE's Demand Response Programs for Business[62] will support the voluntary shift towards electric appliances. In California, electric water heaters increased from a six percent market share in 2009 to 12 percent in 2019, a trend expected to continue due to rising gas utility rates and available incentives.[63,64] While funding levels may fluctuate, current federal, State, regional, and local incentives help offset the upfront costs of electric appliances, further boosting cost-effectiveness.[65]

The quantification applies this market share rate to the share of water heaters needing replacement by 2030. The replacement rate is driven by the schedule of water heaters reaching the end of their useful life. The average lifespan of nonresidential water heaters is approximately ten years.[66] As reliable information regarding the age of distribution of water heaters in the community is not readily available, it is assumed that there is a uniform distribution of water heaters in the community. This means that approximately one in every ten water heaters is expected to retire every year (about ten percent). With **Actions BE-5c** and **BE-5g**'s expected implementation to begin in 2026, there are four years until 2030. This time frame means approximately 40 percent of water heaters will need to be replaced by 2030. Applying the market share rate to these replacements means about five percent of water heaters will be replaced with heat pumps (i.e., 40 percent of 12 percent).

About 28 percent of nonresidential natural gas consumption is used for water heating.[67] Applying this usage rate to forecasted nonresidential natural gas consumption and the five percent of nonresidential buildings transitioning to heat pumps means about 0.0023 percent of total nonresidential natural gas usage will be reduced through voluntary water heater replacements. This estimation excludes the reduction in nonresidential natural gas due to new building electrification

[60] Andolfi, Laura and Ortega, Boris. 2024. Smart Choices: The Influence of Energy Literacy on Energy Technology Adoption. Accessed at: https://www.energy-proceedings.org/wp-content/uploads/icae2024/1732537915.pdf

[61] American Council for an Energy-Efficient Economy (ACEEE). Marketing and Promoting Electrification Using Behavioral Science: Results from a National Survey. Accessed at: https://www.aceee.org/research-report/b2406

[62] Southern California Edison (SCE). Demand Response Programs for Business. Accessed at: https://www.sce.com/business/demand-response

[63] Opinion Dynamics. California Heat Pump Residential Market Characterization and Baseline Study (2022). Accessed at: https://pda.energydataweb.com/#!/documents/2625/view

[64] The California Energy Commission assumes gas utility rates will experience steep increases starting in 2030 under the 2025 building code.

[65] Current federal funding includes the Commercial Buildings Tax Deduction under the Inflation Reduction Act which provides incentives for energy-efficient building upgrades. Funding from this federal act remains uncertain at the time of this report's preparation. On January 20, 2025, Executive Order 14082 halted the disbursement of funds from the Inflation Reduction Act. The future of implementation remains unclear as states and organizations pursue legal and administrative avenues to challenge the Executive Order. State funding includes incentives through the Self-Generation Incentive Program (SGIP) for energy storage systems, as well as heat pump water heater incentives through TECH Clean California. Current local funding includes incentives through Moreno Valley's GREEN MoVal program and SCE's Charge Ready program.

[66] Energy Information Administration (EIA). Updated Buildings Sector Appliance and Equipment Costs and Efficiencies (2023). Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[67] Hopkins, Asa S. et al. Decarbonization of Heating Energy Use in California Buildings (2018). Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

to avoid double counting. While the resulting increase in electricity consumption slightly offsets emissions reductions, continued decarbonization of the electricity grid will mitigate these impacts over time. Progress toward this action will be monitored through the uptake of Moreno Valley's GREEN MoVal programs, building permit data, and trends in nonresidential natural gas usage. The equations used to quantify this action are detailed in Equations 5 through 5.5 and details regarding assumptions, parameters, and calculation results are detailed in Table 20 and Table 21 in Section 8.

Measure BE-5 Nonresidential Natural Gas Reduction Summary

Moreno Valley is projected to achieve its 2030 goal of reducing nonresidential natural gas consumption by about 3.8 percent. This will be accomplished through **Action BE-5b**'s two-way air conditioning reach code, which is expected to achieve a 3.8 percent reduction. Additionally, **Action BE-5c** and **BE-5g**'s water heater market trends will provide a 0.0023 percent reduction. Together, these Actions meet the Measure target of about a 3.8 percent decrease in nonresidential natural gas consumption by 2030. Table 7 outlines the reductions associated with each action, along with the total projected decrease.

These Actions, combined with existing market trends and available incentives, will further support Moreno Valley's efforts to reduce natural gas consumption in existing residential buildings by 2030.

Table 7 Total Existing Nonresidential Building Electrification Summary

Action	2030 Therms Reduced	Percent Reduction
Two-way Air Conditioning Reach Code	270,905	3.8%
Electric Water Heater Replacements	165	0.0023%
Total	**271,070**	**3.8%**

Note: Values and percentages may not add up to totals due to rounding.

BE-6 (supportive): Increase generation and storage of local renewable energy to increase the availability and resilience of renewable power.

Measure BE-6 focuses on increasing the generation and storage of local renewable energy to enhance the availability and resilience of renewable power in Moreno Valley. Key components of Measure BE-6 include **Action BE-6a**, streamlining solar and energy storage permitting in residential buildings to align with SB 379 (2015) requirements, **Action BE-6b**, conducting a feasibility study to explore utility-scale energy storage projects for MVU, and **Action BE-6c**, evaluating the adoption of an ordinance that requires nonresidential buildings to dedicate a percentage of roof space to solar photovoltaic (PV) systems paired with energy storage. The Measure also emphasizes outreach and education, partnering with MVU and SCE to inform residential and nonresidential property owners about renewable energy incentives, while prioritizing engagement with low-income residents and small businesses (**Action BE-6d**). Additionally, it explores funding opportunities through State and federal programs, as well as collaboration with local unions and educational institutions to train the workforce for solar and storage installations (**Action BE-6f** and **BE-6g**).

While Measure BE-6 supports the transition to carbon-free electricity and complements other Building Energy sector measures, its GHG emissions reductions are *not quantified*. This is due to the potential for double counting, as the City's renewable energy goals are already accounted for under Measure BE-1 and the State's transition to 100 percent renewable and carbon-free electricity. Since energy produced by local renewable generation and storage systems reduces the demand for grid electricity—which is becoming increasingly carbon-free—separately quantifying these reductions would overlap with the City's adjusted GHG emissions forecast.

However, Measure BE-6 plays a critical role in strengthening local energy resilience, promoting clean energy investments, and ensuring equitable access to renewable energy solutions. By expanding on-site solar and storage, encouraging microgrid opportunities, and supporting utility-scale energy storage through MVU, the Measure helps reduce vulnerability to grid outages, improves reliability during peak demand, and ensures power availability during emergencies. These investments not only promote clean energy and reduce long-term costs, but also provide visible, community-level benefits that help build trust in the City's climate and energy strategies—especially among residents and businesses most impacted by climate-related disruptions.

4 Strategy T: Transportation

Table 8 Strategy T: Transportation GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy T: Transportation			
T-1	Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.	2,352	6,079
T-2	Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.	9,767	59,435
T-3	Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce commuter vehicle miles traveled.	61,426	125,963
T-4	Achieve zero-emission vehicle adoption rates of 31% for passenger vehicles and 19% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.	111,067	646,245
T-5	Implement programs to support California Air Resources Board and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.	18,335	38,918
Total		**202,947**	**876,641**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

T-1: Implement programs to increase active transportation mode share from less than 1% to 3% by 2030 and to 6% by 2045.

Measure T-1 aims to increase Moreno Valley's active transportation mode share from one percent[68] to three percent by 2030 and to six percent by 2045, through a comprehensive update and implementation of Moreno Valley's Bicycle Master Plan. The primary Actions that enable this Measure include:

- **Action T-1b** which directs the City to implement the updated Bicycle Master Plan to double Moreno Valley's Bicycle Network Analysis (BNA) score and convert at least 20 miles of high stress streets to safe bikeways by 2030; and implement City policies to provide a safe and well-connected multi-modal system, as well as include the development of Complete Street initiatives.

As an initial performance standard, the City will monitor the update and implementation of the Bicycle Master Plan. To assess its effectiveness in reducing GHG emissions, the City will monitor the expansion of its active transportation network through additional bicycle lanes and monitor impact through changes in active transportation mode shares, published in the American Community Survey 5-Year Estimates by the U.S. Census Bureau,[69] over time. The following subsection details the methodology, assumptions, and calculations used to substantiate the estimated increase in active transportation mode share from the implementation of **Action T-1b**.

Action T-1b Substantiation – Updated Bicycle Master Plan

ASSERTION

Implementation of the updated Bicycle Master Plan established under **Action T-1b** will double Moreno Valley's BNA score—a measure of the quality and connectivity of bicycle networks—and convert at least 20 miles of high stress streets to safe bikeways by 2030. Complemented with **Action T-1b**'s implementation of Complete Streets Initiatives, this increase in the quality and connectivity of Moreno Valley's bicycle network will raise Moreno Valley's bicycle mode share to 2.2 percent by 2030. With a constant walking mode share of 0.8 percent, this increase will raise Moreno Valley's active transportation mode share to three percent by 2030. The resulting increase in bicycle trips will displace vehicle trips, leading to an estimated 0.4 percent reduction in passenger vehicle miles traveled (VMT) and associated GHG emissions.

EVIDENCE

Moreno Valley's current active transportation mode share is low, with bicycle and walking modes accounting for 0.2 percent and 0.8 percent, respectively, in 2019 (i.e., Moreno Valley's baseline inventory year). However, there is substantial potential for growth. Approximately 27 percent of vehicle trips nationwide are two miles or less, a distance easily traveled by bicycle.[70] With year-round favorable weather and suitable terrain, Moreno Valley is well-positioned to target short-distance trips to increase its bicycle mode share.

Studies show that investments in bicycle network quality or connectivity have significant impacts on bicycle mode share rates. Investments in bicycle network quality and connectivity involve

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[68] US Census Bureau. 2019: ACS 5-Year Estimates Subject Tables. S0801 | Commuting Characteristics by Sex. Accessed at: https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270
[69] U.S. Census Bureau. ACS 5-Year Estimates Subject Tables. S0801 | Community Characteristics by Sex.
[70] National Household Travel Survey. Population Vehicle Trips Statistics (2021). Accessed at: https://nhts.ornl.gov/vehicle-trips

prioritizing efficiency, safety, and access to key destinations, rather than a limited focus of just bicycle network length.[71] The PeopleForBikes' BNA score provides a measure of bicycle network quality and connectivity by measuring how easily bicyclists can get to key destinations on a connected, comfortable network. Moreno Valley's current network receives an overall BNA score of 19 out of 100.[72] The map shows that low-stress, primarily residential streets throughout the community are constrained by major high-stress arteries. This score suggests substantial room for improvement in network quality and connectivity. A case study of Algiers, New Orleans demonstrated that a few targeted and strategic improvements—rather than numerous system-wide improvements—can provide significant BNA score gains in communities with primarily residential streets constrained by major high-stress arteries. The study estimated that by converting a few high stress streets to low stress bikeways, Algiers could add 20 points to its BNA score.[73] This case study, demonstrates the feasibility of doubling Moreno Valley's BNA score from 19 to 38 by 2030 through limited but strategic improvements in **Action T-1b**'s updated Bicycle Master Plan by focusing on decreasing road stress and increasing access to key destinations.

The City of Berkeley and the City of Davis provide reference points to translate BNA score improvements to bicycle mode share improvements. The City of Berkeley, with a BNA score of 73,[74] has achieved a 9.7 percent bicycle mode share.[75] Similarly, the City of Davis, with a BNA score of 81,[76] has reached a 20 percent bicycle mode share.[77] These cities demonstrate an average 0.2 percent of bicycle mode share gained per BNA score point. Applying the City of Berkeley's and the City of Davis' average ratio to Moreno Valley means doubling their BNA score could yield a bicycle mode share as high as seven percent. To remain conservative, the quantification assumes that doubling Moreno Valley's BNA score will yield a bicycle mode share of 2.2 percent by 2030.

Implementation of the updated Bicycle Master Plan will be complemented with the implementation of Complete Streets initiatives. Research indicates that Complete Streets, which promote safe and convenient access for biking, walking, and transit, increase active transportation mode shares while reducing VMT.[78] Given Moreno Valley's conduciveness for year-round cycling[79] like the Cities of Berkeley and Davis, along with its commitment to implementing Complete Streets initiatives, achieving a 2.2 percent bicycle mode share by 2030 is a reasonable and achievable target.

The bicycle mode share increase is calculated by comparing Moreno Valley's 2019 baseline levels to the Measure T-1 active transportation targets of three percent by 2030. The comparison assumes walking mode share remains constant at baseline levels in future years. Increasing bicycle mode share directly reduces passenger vehicle trips by replacing trips of approximately 1.5-miles—a

71 Pedestrian and Bicycle Information Center. Info Brief: Using Connectivity Measures to Evaluate and Build Connected Bicycle Networks. Accessed at: https://www.pedbikeinfo.org/cms/downloads/PBIC_Brief_MeasuringNetworks_FINAL.pdf.
72 PeopleForBikes. Bicycle Network Analysis: Moreno Valley, CA, US (2025). Accessed at: https://bna.peopleforbikes.org/#/places/161f90bb-3d30-44b8-953b-ca9a30c4ad95/.
73 Pedestrian and Bicycle Information Center. Info Brief: Using Connectivity Measures to Evaluate and Build Connected Bicycle Networks. Accessed at: https://www.pedbikeinfo.org/cms/downloads/PBIC_Brief_MeasuringNetworks_FINAL.pdf.
74 PeopleForBikes. Bicycle Network Analysis: Moreno Valley, CA, US (2025). Accessed at: https://bna.peopleforbikes.org/#/places/c152a7f2-d131-4d43-87e2-7aa31161da73/.
75 City of Berkeley. City of Berkeley Bicycle Plan (2017). Accessed at: https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley-Bicycle-Plan-2017-Executive%20Summary.pdf
76 PeopleForBikes. Bicycle Network Analysis: Moreno Valley, CA, US (2025). Accessed at: https://bna.peopleforbikes.org/#/places/6274b2c5-0a5d-4724-9244-c20140355481/.
77 The Guardian. Davis, California – the American city which fell in love with the bicycle (2015). Accessed at: https://www.theguardian.com/cities/2015/aug/03/davis-california-the-american-city-which-fell-in-love-with-the-bicycle
78 University of Las Vegas. An Economic Summary on the Benefits of Complete Streets (2021). Accessed at: https://cber.unlv.edu/wp-content/uploads/2022/06/Complete-Streets-White-Paper_Sept-2021.pdf
79 According to Moreno Valley's Bicycle Master Plan, "[a]long with level terrain, its grid street system and weather support year round cycling." Accessed at: https://moreno-valley.ca.us/departments/public-works/transportation/pdfs/BicycleMasterPlan.pdf

conservative estimate consistent with California's Statewide average bicycle trip length according to CARB.[80] Projected passenger trips are first reduced by the reductions achieved through the work-from-home measure (Measure T-3) to avoid double counting. This shift translates to a 0.4 percent reduction in passenger VMT in Moreno Valley by 2030. The reduction in VMT is then multiplied by forecasted VMT emissions factors to estimate the total GHG emissions reduction. Notably, this 0.4 percent reduction is well within the range observed in urban areas with strong commitments to bicycle travel. According to a study by the Institute for Transportation and Development Policy and the University of California, Davis, VMT reductions of up to 11 percent have been documented in urban areas with commitments to bicycle travel.[81] The equations used to quantify this action are detailed in Equations 6 through 6.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 22 and Table 23 in Section 8.

[80] California Air Resources Board (CARB). Quantifying Reductions in Vehicle Miles Traveled from New Bike Paths, Lanes, and Cycle Tracks (2019). Accessed at: https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdf

[81] Jacob Mason et al., Institute for Transportation & Development Policy and the University of California, Davis. A Global High Shift Cycling Scenario (2015). Accessed at: https://www.bisikletizm.com/wp-content/uploads/2016/03/A-Global-High-Shift-Cycling-Scenario_Bisikletli-Ulasim-Senaryosu.pdf.

T-2: Work with the Riverside Transit Agency to increase public and multi-modal transportation mode share from about 1% to 2.7% by 2030 and to 10% by 2045.

Measure T-2 aims to increase Moreno Valley's public transit mode share from about one percent to 2.7 percent by 2030 and ten percent by 2045. The primary Actions that enable this Measure are:

- **Action T-2c** which commits the City to require parking management plans (i.e., eliminate parking minimums, develop parking maximums) to increase public transportation use;
- **Action T-2d** which directs the City to work closely with the Riverside Transit Agency (RTA) to implement public and multi-modal transportation opportunities (i.e., micro-transit services, enhanced connections between residential neighborhoods and key employment centers, and first- and last-mile access to major transit hubs) and improvements to bus routes in Moreno Valley;
- **Action T-2f** which commits the City to cross-promote RTA's public transit and multi-modal transportation options on the City's website and at Moreno Valley community events and centers; and,
- **Action T-2g** which directs the City to work with RTA and other regional partners to continue offering subsidize transit programs, as well as seek funding opportunities through State and federal grants.

As an initial performance standard, the City will preliminarily track the successful development and implementation of parking management plans identified in **Action T-2c** as well as RTA bus route improvements (e.g., frequency improvements and route expansions) identified in **Action T-2d**. To monitor the impact of these Actions in achieving Measure T-2 goals, the City will monitor annual RTA ridership rates and changes in public transit mode share, published in the American Community Survey 5-Year Estimates by the U.S. Census Bureau,[82] over time. The following subsection details the methodology, assumptions, and calculations used to substantiate the estimated increase in public transit mode share from the implementation of **Actions T-2c**, **T-2d**, **T-2f** and **T-2g**.

Actions T-2c, T-2d, T-2f and T-2g Substantiation – Public Transit, Multi-modal Transportation, and Parking Management Implementation

ASSERTION

By working closely with RTA to implement public transit improvements (**Action T-2d**), continue subsidized and discount transit programs (**Action T-2g**), and promote RTA's public transit opportunities (**Action T-2f**), Moreno Valley will increase its public transit mode share back to 2019 levels (i.e., 1.2 percent). The remaining 1.5 percent needed to achieve Measure T-2's target of 2.7 percent public transit mode share by 2030 will be achieved through parking management plans (**Action T-2c**) and increasing multi-modal transportation opportunities (**Action T-2d**). The increase in public transit mode share will shift passenger trips from single-occupancy vehicles to public transit, resulting in an estimated 2.9 percent reduction in passenger VMT and associated GHG emissions by 2030.

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[82] U.S. Census Bureau. ACS 5-Year Estimates Subject Tables. S0801 | Community Characteristics by Sex.

EVIDENCE

Action T-2d directs the City to work with RTA to continue implementing public transit opportunities and improving bus routes in Moreno Valley while **Action T-2g** directs the City to work with RTA and regional partners to sustain subsidized and discounted transit programs. According to RTA, ridership rates fell by 70 percent during the COVID-19 pandemic but started to improve thereafter. As of fiscal year (FY) 2024, ridership remains 34 percent below pre-pandemic levels. RTA's Short Range Transit Plan (SRTP) projects a five percent increase in ridership from FY2024 to FY2025, primarily due to fare promotions such as 25-cent summer fares and free rides on Fridays.[83] Assuming this trend continues annually, ridership is expected to grow by a cumulative 25 percent from FY2024 levels by 2030—bridging most of the gap to return ridership to 2019 levels and Moreno Valley's public transit mode share to 2019's public transit mode share level of 1.2 percent. **Action T-2f** will further support this ridership recovery by actively promoting RTA's public transit options through the City's website, community events, and centers. Public outreach and education, alongside service approvements and policy changes, contribute to increasing transit ridership, as demonstrated by transit agencies that have successfully leveraged community engagement as part of broader ridership recovery efforts.[84] For example, in 2022, Vancouver's TransLink launched a similar ridership recovery campaign that helped increase network-wide ridership by 10 percent.[85] By implementing similar outreach strategies, **Action T-2f** will bridge the remaining gap to reach 2019 levels.

To achieve the Measure T-2 target of a 2.7 percent public transit mode share by 2030, Moreno Valley will implement additional strategies beyond ridership recovery strategies used by RTA. **Action T-2c** focuses on adopting parking management plans, including eliminating minimums and establishing maximums. Research shows these initiatives can reduce single-occupancy vehicle trips by up to 30 percent for public parking and 13.7 percent for residential parking, shifting more trips to public transit.[86] Additionally, through **Action T-2d**, Moreno Valley will address first- and last-mile gaps by collaborating with RTA to expand multi-modal transportation options, such as microtransit services. Research from Via, a microtransit provider, found that over 40 percent of their rides replaced single-occupancy vehicle trips, reducing trip-related GHG emissions by more than 35 percent.[87] Together, these initiatives will increase Moreno Valley's public transit mode share above 2019 levels to 2.7 percent by 2030.

The quantification of Measure T-2 is based on the anticipated increase in public transit mode share resulting from the implementation of **Actions T-2c**, **T-2d**, **T-2f** and **T-2g**. The mode share increase is calculated by comparing Moreno Valley's 2019 baseline of 1.2 percent to Measure T-2's target of 2.7 percent by 2030. Increasing public transit mode share directly reduces passenger vehicle trips by replacing trips of approximately 8.4-miles—RTA's average bus trip distance.[88] Projected passenger trips reduced by the reductions achieved through the work-from-home and active transportation measures (Measure T-3 and Measure T-1) are accounted for prior to this Measure reductions to avoid double counting. This shift translates to a 2.9 percent reduction in passenger VMT. The

[83] Riverside Transit. Short Range Transit Plan FY25-FY27 (2024). Accessed at: https://www.riversidetransit.com/images/DOWNLOADS/PUBLICATIONS/SRTPS/FY2025-2027%20SRTP.pdf

[84] Nawshin Tabassum, Hannaneh Abdollahzadeh Kalantari, Justyna Kaniewska, *et al*. Case Studies on Transport Policy. Ways of increasing transit ridership-lessons learned from successful transit agencies (2025). Accessed at: https://www.sciencedirect.com/science/article/pii/S2213624X24002177

[85] Union Internationale des Transports Publics (UITP). Vancouver's "Ride & Shine" ridership recovery campaign (2022). Accessed at: https://www.uitp.org/case-studies/vancouvers-ride-shine-ridership-recovery-campaign/

[86] CAPCOA. Handbook for Analyzing Greenhouse Gas Emission Reductions. Measure T-24 and T-15.

[87] Via. How microtransit helps reduce emissions (2023). Accessed at: https://ridewithvia.com/resources/how-microtransit-helps-reduce-emissions

[88] U.S Department of Transportation. 2022 Agency Profile – Riverside Transit Agency. Accessed at: https://www.transit.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2022/90031.pdf.

reduction in VMT is then multiplied by forecasted VMT emissions factors to estimate the total GHG emissions reduction. Notably, this 2.9 percent reduction is well within the ranges observed for parking management plans and microtransit services, where VMT reductions of up to 30 percent and 35 percent have been documented.[89,90] The equations used to quantify this action are detailed in Equations 7 through 7.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 24 and Table 25 in Section 8.

[89] CAPCOA. Handbook for Analyzing Greenhouse Gas Emission Reductions. Measure T-24 and T-15.
[90] Via. How microtransit helps reduce emissions (2023). Accessed at: https://ridewithvia.com/resources/how-microtransit-helps-reduce-emissions

T-3: Implement programs to increase the work-from-home rate from 3% to 15% in 2030 and 25% in 2045 to reduce commuter vehicle miles travelled.

Measure T-3 aims to increase Moreno Valley's work-from-home rate to 15 percent by 2030 and 25 percent by 2045 to reduce commuter VMT. The primary Actions that enable this Measure are:

- **Action T-3a** which directs the City to develop a broadband internet service plan to expand access to robust broadband internet service in the community and increase opportunities for residents to work from home;
- **Action T-3b** which commits the City to maintain a list of Transportation Demand Management (TDM) strategies for employers and new development to adopt, including work-from-home accommodation and public transit use; and,
- **Action T-3c** which commits the City to continue to offer Hire MoVal incentives to businesses to encourage local businesses to employ Moreno Valley residents to reduce VMT, as well as incorporate resources and incentives (i.e., stipends, license discounts) for businesses that maintain remote work policies for employees.

As an initial performance standard, the City will track the successful development and implementation of the broadband internet service plan identified in **Action T-3a**, the recommended TDM strategies (**Action T-3b**) and the number and amount of Hire MoVal incentives awarded to businesses with work-from-home policies (**Action T-3c**). To monitor the impact of these Actions in achieving Measure T-3 goals, the City will monitor changes in work-from-home rates, published in the American Community Survey 5-Year Estimates by the U.S. Census Bureau,[91] over time. The following subsection details the methodology, assumptions, and calculations used to substantiate the estimated reduction in the estimated increase in work-from-home mode share from the implementation of **Actions T-3a, T-3b, and T-3c.**

Measure T-3 Substantiation

ASSERTION

Offering incentives to businesses with remote work policies, expanding broadband access, and encouraging employees to work from home will allow Moreno Valley to continue to increase their work-from-home mode share by one percent annually from about seven percent in 2023 to 15 percent by 2030. Increasing the work-from-home mode share will displace passenger vehicle trips resulting in an estimated nine percent reduction in passenger VMT and associated GHG emissions by 2030.

EVIDENCE

Work-from-home mode share in Moreno Valley has increased by approximately one percent each year from 2.7 percent in 2019 to 7.2 percent in 2023.[92] Measure T-3 employs several Actions to support the continuation of this trend through 2030, targeting a 15 percent work-from-home mode share by 2030. Research shows that reliable broadband access is a barrier to remote work. A study by Deloitte indicates that a 10 percent increase in broadband penetration nationally in 2016 would

[91] U.S. Census Bureau. ACS 5-Year Estimates Subject Tables. S0801 | Community Characteristics by Sex.
[92] U.S. Census Bureau. ACS 5-Year Estimates Subject Tables. S0801 | Commuting Characteristics by Sex (2019). Accessed at: https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270.

have resulted in an average annual increase of 269,000 jobs in the U.S. through 2019.[93] To address this barrier and increase remote work, the City will continue to develop and implement a broadband internet service plan (**Action T-3a**). The City will also maintain a list of TDM strategies to encourage work-from-home and other commute alternatives (**Action T-3b**) and offer Hire MoVal incentives for businesses that implement remote work policies (**Action T-3c**). Research shows that commute trip reduction programs—which reduce single-occupancy vehicle trips by promoting carpooling, transit, and active transportation—can lower commute-related VMT by up to 26 percent.[94] Incentivizing remote work with TDM strategies and business incentives will achieve similar outcomes by directly eliminating commute trips.

The quantification of Measure T- T-3 applies the projected work-from-home rate increase to only the portion of forecasted passenger VMT attributed to work commutes. The mode share increase is calculated by comparing Moreno Valley's 2019 baseline of 2.7 percent to Measure T-2's target of 15 percent by 2030. Nationwide, work commutes account for approximately 28 percent of total VMT.[95] The mode share increase is thus applied to only 28 percent of the forecasted passenger VMT that is associated with work commutes. Increasing work-from-home rate directly reduces passenger vehicle trips related to commuting by replacing trips of approximately 20 miles. While the average work commute of Moreno Valley residents is approximately 28.6 miles roundtrip,[96] the quantification utilizes 20 miles to remain conservative.[97] This shift translates to a nine percent reduction in passenger VMT. The reduction in VMT is then multiplied by forecasted VMT emissions factors to estimate the total GHG emissions reduction. Notably, this nine percent reduction is well within the ranges observed for commute trip reduction programs, where VMT reductions up to 26 percent have been documented.[98] The equations used to quantify this action are detailed in Equations 8 through 8.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 26 and Table 27 in Section 8.

[93] Deloitte. Broadband for All: Charting a Path to Economic Growth (2021). Accessed at: https://s3.amazonaws.com/connected-nation/de62e41e-f8c2-4eb6-aca5-32c1bcf07802/us-charting-a-path-to-economic-growth.pdf

[94] California Air Pollution Control Officers Association (CAPCOA). Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (2021). Measure T-6. Accessed at: https://www.caleemod.com/documents/handbook/full_handbook.pdf

[95] U.S. Department of Transportation. Commuting in A Post-Baby Boomer World (2016). Accessed at: https://highways.dot.gov/public-roads/januaryfebruary-2016/commuting-post-baby-boomer-world

[96] Replica. Accessed at: https://www.replicahq.com/

[97] The quantification uses a 20-mile roundtrip distance because this represents a ten-mile one-way trip within the City limits. This trip length is used in alignment with the Regional Transportation Analysis Committee's (RTAC) guidelines for VMT accounting in GHG emissions inventories.
RTAC. Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375. Accessed at: https://www.fresnocog.org/wp-content/uploads/files/SB375/finalreport.pdf.

[98] California Air Pollution Control Officers Association (CAPCOA). Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (2021). Measure T-6. Accessed at: https://www.caleemod.com/documents/handbook/full_handbook.pdf

T-4: Achieve zero-emission vehicle adoption rates of 31% for passenger vehicles and 19% for commercial vehicles by 2030 and 100% for both vehicle types by 2045.

Measure T-4 aims to achieve passenger and commercial zero-emission vehicle (ZEV) adoption rates of 31 percent and 19 percent, respectively, by 2030, and 100 percent for both vehicle types by 2045. The primary Actions that enable this Measure are:

- **Action T-4b** which directs the City to develop and adopt an electric vehicle (EV) reach code by 2026 requiring new multifamily and commercial construction to install the minimum number of EV chargers based on CalGreen Tier 2 requirements;
- **Action T-4c** which directs the City to install 961 new publicly accessible chargers by 2030 and 7,376 by 2045 through public-private partnerships, prioritizing installation locations and charger types based on guidance from the Moreno Valley EV Charging Infrastructure Master Plan;[99] and,
- **Action T-4d** which directs the City to launch a public outreach campaign to inform residents and commercial vehicle fleet owners the available local, regional, State, and federal incentives for ZEVs.

As an initial performance standard, the City will monitor that **Action T-4b's** EV reach code is implemented by 2026 following local adoption. To assess its effectiveness in reducing GHG emissions, the City will track the number of EV chargers installed based on CalGreen Tier 2 requirements as well as the number of publicly accessible chargers installed, as detailed in **Action T-4c**. The City will update the reach code as needed during each review cycle. To monitor the impact of these Actions in achieving Measure T-4 goals, the City will monitor changes in passenger and commercial ZEV adoption over time, via DMV records. The following subsections detail the methodology, assumptions, and calculations used to substantiate the estimated increase in passenger and commercial ZEV adoption from the implementation of **Actions T-4b, T-4c, and T-4d**.

Actions T-4b, T-4c, and T-4d Substantiation – Passenger EV Charging Infrastructure

ASSERTION

Through the adoption of an EV charger reach code for new multi-family buildings (**Action 4-b**), public-private partnerships (**Action 4-c**), and outreach on ZEV incentives (**Action 4-d**), Moreno Valley will install the private and publicly accessible EV charging infrastructure needed to support a ZEV adoption rate of 31 percent. This effort directly supports California's Statewide goals to install approximately 1.2 million public and shared private chargers by 2030 to meet the growing demand for ZEVs.[100] Expansion of local charging infrastructure will help Moreno Valley align with this State-level target by providing community members with convenient, reliable access to charging—critical for accelerating ZEV adoption. Increased ZEV adoption will directly replace internal combustion engine (ICE) passenger VMT with ZEV VMT. This replacement will achieve a 26 percent reduction in ICE passenger VMT.

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[99] City of Moreno Valley. Moreno Valley Electric Vehicle Charging Infrastructure Master Plan. Accessed at: https://moreno-valley.ca.us/departments/public-works/transportation/pdfs/MV-EV-ChargingInfrastructure-Plan.pdf

[100] California Energy Commission (CEC). Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035 (2024). Accessed at: https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment#:~:text=The%20analysis%20presented%20in%20this,support%20jobs%20of%20the%20future

EVIDENCE

Studies have consistently identified limited charging infrastructure as one of the primary barriers to EV adoption.[101, 102] California has set a target of installing 1.2 million public and shared private chargers by 2030 to support the growing number of EVs on the road, as outlined in the CEC's AB 2127 Electric Vehicle Charging Infrastructure Assessment.[103] **Actions T-4b, T-4c,** and **T-4d** address this barrier by expanding the availability of EV chargers through public-private partnerships, requiring new multifamily developments to install chargers per CALGreen Tier 2 standards, and informing residents about available ZEV incentives. Publicly accessible EV chargers make owning an EV convenient for all drivers—including those who cannot charge at home or drive daily distances longer than their EV battery range. It is expected that 20 percent of EV charging nationally will occur at publicly accessible chargers in 2030, underscoring the need for widespread infrastructure expansion.[104] As of 2024, the number of public EV chargers in California has surpassed the number of gas stations, signaling a turning point in the State's transition toward electrified transportation and the feasibility of Moreno Valley's charger goals.[105] Market trends show rapid EV adoption across California, with EVs comprising about 25 percent of new car sales in 2023.[106] Supporting this growth with robust infrastructure is critical to achieving Statewide and local ZEV goals.

The number of publicly accessible EV chargers needed to support Moreno Valley's 31 percent passenger ZEV adoption target by 2030 and 100 percent adoption by 2045 was calculated using the U.S. Department of Energy's Electric Vehicle Infrastructure Projection Tool outputs for Moreno Valley's MSA (i.e., the Riverside-San Berardino-Ontario Metropolitan Area).[107] The quantification assumes all ZEVs will be EVs to remain conservative in the plan for EV chargers. Based on Moreno Valley's share of vehicles within the region, the quantification determined that 961 publicly accessible chargers will be required by 2030. Existing EV charging infrastructure in cities such as San Jose, San Francisco, San Diego and Irvine demonstrate the feasibility of reaching this goal, with each already hosting over 900 public chargers, while Los Angeles has over 6,600.[108]

Through public-private funding and partnerships, Moreno Valley will facilitate the installation of **Action T-4c**'s 961 publicly accessible EV chargers by 2030 at prioritized locations on City-owned properties and across the community to support the Measure's passenger ZEV adoption goals. Public-private partnerships are essential to this expansion; private charging network companies own and operate the majority of EV chargers in the U.S., with roughly 47,000 stations managed by around 30 networks, including market leaders like ChargePoint and Tesla.[109] Leveraging partnerships with these companies will allow the City to expand infrastructure efficiently while reducing costs

[101] Kumar, Rajeev Ranjan and Kumar Alok. Adoption of Electric Vehicle: A Literature Review and Prospects for Sustainability (2020). Accessed at: https://www.sciencedirect.com/science/article/abs/pii/S095965261934781X

[102] Winjobi, Olumide and Kelly, Jarod. Used Plug-in Electric Vehicles as a Means of Transportation Equity in Low-Income Households (2021). Accessed at: https://www.osti.gov/biblio/1658592

[103] California Energy Commission (CEC). Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035 (2024). Accessed at: https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment#:~:text=The%20analysis%20presented%20in%20this,support%20jobs%20of%20the%20future

[104] Kampshoff, Philipp et al. Building the Electric-Vehicle Charging Infrastructure America Needs (2022). Accessed at: https://www.mckinsey.com/industries/public-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs

[105] CEC. California Exceeds 178,000 Electric Vehicle Chargers (2025). Accessed at: https://www.energy.ca.gov/news/2025-03/california-exceeds-178000-electric-vehicle-chargers

[106] Inside EVs. California's Plug-In Car Sales Almost Reached 25% Market Share In 2023 (2024). Accessed at: https://insideevs.com/news/706642/california-plugin-car-sales-2023q4

[107] U.S. Department of Energy. Electric Vehicle Infrastructure Projection Tool (EVI-Pro) Lite. Accessed at: https://afdc.energy.gov/evi-pro-lite

[108] PlugShare. Best EV Charging Cities in California. Accessed at: https://www.plugshare.com/directory/us/california

[109] Rabobank. The rise of electric vehicles in the US: Building a robust charging network (2024). Accessed at: https://www.rabobank.com/knowledge/d011438559-the-rise-of-electric-vehicles-in-the-us-building-a-robust-charging-network

and drawing on industry expertise. The majority of these installations will be carried out through existing local (e.g., MVU 555 Electric Vehicle Residential Incentive Program[110]), regional (e.g., South Coast AQMD Replace Your Ride[111]), State and federal (e.g., Inflation Reduction Act)[112] funding opportunities. The 2024 Moreno Valley EV Charging Infrastructure Master Plan provides guidance on charger locations and charger types, as well as identifies partnerships to fund, operate, and maintain the installations.[113] The City will focus on installing chargers in locations not well served by market forces and areas with low, but increasing, EV adoption. The equations used to quantify this action are detailed in Equations 9 through 9.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 28 and Table 29.

Additionally, the reach code established under **Action T-4b** will require all new multifamily developments to install EV chargers in accordance with CALGreen Tier 2 standards beginning in 2026. This will mandate that 20 percent of parking spaces in new multifamily buildings include EV chargers, addressing a key barrier to ZEV adoption for residents without dedicated parking. By ensuring reliable and accessible charging in new developments, this policy will further enable Moreno Valley to meet its ZEV adoption targets.

The reach code is supported by **Action T-4d**, which directs the City to launch a public outreach campaign to inform residents about the benefits of ZEVs and the available incentives for ZEVs, such as MVU's 555 EV Program[114] and SCE's Pre-Owned EV Rebates[115] and Clean Vehicle Rebate Project.[116] These incentives, along with local, regional, State and federal funding sources, help cover the upfront costs of purchasing an EV and installing the necessary charging infrastructure—addressing high costs as a key barrier to EV adoption for low-income households.[117]

Together, these Actions will expand both public and private EV charging infrastructure to support a 31 percent passenger ZEV adoption by 2030 and a 100 percent ZEV adoption by 2045. The quantification is based on the ICE passenger VMT replaced with the projected ZEV passenger VMT based on adoption increases. The analysis calculates the ZEV adoption increase that the Measure's targets will achieve by comparing them to baseline levels expected in the forecast. From this increase, the calculations assume a one-for-one replacement of ICE VMT with ZEV VMT rather than linking VMT reductions directly to charger installations. This approach ensures adequate infrastructure planning while maintaining conservative estimates on VMT impacts. The forecasted passenger VMT reduced by the reductions achieved through the active transportation, public transit, and work-from-home Measures (Measure T-1, Measure T-2 and Measure T-3) are accounted for prior to this Measure VMT reductions to avoid double counting. The quantification then applies emission factors from the forecast to estimate the GHG emissions reduction from the ICE passenger VMT replaced with ZEV passenger VMT. The equations used to quantify this action are detailed in Equations 10 through 10.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 30 and Table 31 in Section 8.

[110] City of Moreno Valley. Electric Vehicle Incentives. Accessed at: https://www.moval.org/mvu/ev-incentives.html
[111] South Coast AQMD. Replace Your Ride. Accessed at: https://xappprod.aqmd.gov/RYR/
[112] Funding from this federal act remains uncertain at the time of this report's preparation. On January 20, 2025, U.S. Executive Order 14082—issued as part of a broader directive titled "Unleashing American Energy"—halted the disbursement of funds from the Inflation Reduction Act. The future of implementation remains unclear as states and organizations pursue legal and administrative avenues to challenge the Executive Order.
[113] The City of Moreno Valley. EV Charging Infrastructure Master Plan (2024). Accessed at: https://moreno-valley.ca.us/departments/public-works/transportation/pdfs/MV-EV-ChargingInfrastructure-Plan.pdf
[114] City of Moreno Valley. Electric Vehicle Incentives. Accessed at: https://www.moval.org/mvu/ev-incentives.html
[115] SCE. Pre-owned Electric Vehicle Rebate Program. Accessed at: https://evrebates.sce.com/
[116] SCE. EV Rebates & Rates. Accessed at: https://www.sce.com/residential/ev-rates-rebates
[117] Gaillard, Isa. Ingredients for Equitable Electrification: Analyzing Equity in Statewide Electric Vehicle Rebate Programs (2022). Accessed at: https://greenlining.org/wp-content/uploads/2022/10/Greenlining-Ingredients-Equitable-Transportation-WebFINAL.pdf

Actions T-4b and T-4d Substantiation – Commercial EV Charging Infrastructure

ASSERTION

The reach code established under **Action T-4b** requires new commercial construction to install EV chargers in accordance with CalGreen Tier 2 requirements, mandating that 19 percent of total parking spaces include chargers. This reach code will expand the number of commercial EV chargers in Moreno Valley, supporting increased ZEV adoption rates by providing businesses with convenient access to charging infrastructure. This Action will also support compliance with the Advanced Clean Fleets (ACF) regulation,[118] which requires commercial fleets to transition to ZEVs, and aligns with Cornerstone Measure C-1 to develop MDHD ZEV refueling depots along the SR-60 corridor. As a result, this Action strives to achieve a 14 percent reduction in ICE commercial VMT.

EVIDENCE

Action T-4b directs the City to adopt CALGreen Tier 2 voluntary measures as a reach code in 2026, making them mandatory for new commercial construction. These measures require that 20 percent of parking spaces in new commercial developments include EV chargers, addressing a key barrier to ZEV adoption—particularly for commercial fleet operators needing on-site charging—while supporting the City's ZEV adoption targets.

The reach code also supports compliance with the State's ACF regulation, which requires commercial vehicle fleets to transition to ZEVs beginning in 2024. Expanding commercial EV charging infrastructure will help businesses meet ACF requirements by ensuring sufficient charging capacity for fleet electrification.

Additionally, this effort aligns with Cornerstone Measure C-1, which facilitates the development of MDHD ZEV refueling depots along the SR-60 corridor to support regional freight electrification. By increasing the availability of commercial EV chargers, the City is helping establish the necessary infrastructure to transition both light- and heavy-duty fleets to zero-emission technologies.

The reach code is further supported by **Action T-4d**, which directs the City to launch a public outreach campaign to inform commercial vehicle fleet owners about the benefits of ZEVs and the available incentives for ZEVs, such as MVU's Clean EV Program;[119] SCE's Charge Ready program;[120] CARB's Clean Truck and Bus Vouchers (HVIP);[121] Cal Fleet Advisors' fleet electrification concierge service[122] to businesses and commercial vehicle fleet owners subject to the ACF regulation; the California Capital Access Program's Zero-Emission Heavy-Duty Programs;[123] and the Low Carbon Fuel Standard's infrastructure, fueling, and solar credits.[124] These incentives, along with local, regional, State and federal funding sources, help offset the costs of purchasing ZEVs and installing the necessary charging infrastructure. Together, these Actions will enable Moreno Valley to install as

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[118] In 2025, California withdrew the request for a waiver for the addition of the ACF regulation to the State's emissions control program. At this time, CARB is not enforcing the portions of the ACF regulation that require a federal waiver. However, not all elements of the ACF regulation require a federal waiver or authorization. The State and local government fleets portion of the ACF regulation remains unaffected. Additionally, CARB is encouraging affected industries and fleets to continue reducing their GHG emissions.

[119] City of Moreno Valley. Electric Vehicle Incentives. Accessed at: https://www.moval.org/mvu/ev-incentives.html

[120] Southern California Edison (SCE). Charge Ready Program. Accessed at: https://www.sce.com/evbusiness/chargeready

[121] California Air Resources Board (CARB). Clean Truck & Bus Vouchers (HVIP). Accessed at: https://ww2.arb.ca.gov/our-work/programs/clean-truck-bus-vouchers-hvip

[122] Cal Fleet Advisor. Accessed at: https://calfleetadvisor.org/

[123] California State Treasurer. CalCAP Zero-Emission Heavy-Duty Programs. Accessed at: https://www.treasurer.ca.gov/cpcfa/calcap/zero-emission/index.asp

[124] California Air Resources Board (CARB). LCFS Credit Generation Opportunities. Accessed at: https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-credit-generation-opportunities.

many privately owned EV chargers in new and existing buildings as practical to support a 19 percent commercial ZEV adoption by 2030.

The quantification methodology estimates the replacement of ICE commercial VMT with ZEV commercial VMT based on projected adoption increases. It calculates the additional ZEV adoption achieved under this Measure by comparing it to baseline forecasted levels for commercial vehicles. A one-for-one replacement assumption is applied to ensure conservative estimates, focusing on infrastructure needs rather than attributing VMT reductions solely to charger installations. Emission factors from the forecast are applied to estimate GHG reductions from the ICE commercial VMT displaced by ZEVs. The equations used to quantify this action are detailed in Equations 10 through 10.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 30 and Table 31 in Section 8.

T-5: Implement programs to support California Air Resources Board and South Coast Air Quality Management District goals to decarbonize 30% of off-road equipment by 2030 and 100% by 2045.

Measure T-5 aims for Moreno Valley to decarbonize 30 percent of off-road vehicle and equipment use in the community by 2030 and 100 percent by 2045. The primary Actions that enable this Measure include:

- **Action T-5a** which commits the City to develop a phased ordinance by 2027 to ban the local operation of fossil fuel-powered off-road equipment by type and enforce the use of R99 and R100 renewable diesel as well as compliance with CARB's small off-road engines (SORE) regulations by 2030;
- **Action T-5d** which directs the City to work with South Coast Air Quality Management District (AQMD) to promote the availability of off-road rebates under their Residential and Commercial Electric Lawn and Garden Equipment Rebate Programs[125] and Carl Moyer Program,[126] as well as CARB's Clean Off-Road Equipment Voucher Incentive Program;[127] and,
- **Action T-5e** which directs the City to collaborate with neighboring jurisdictions and South Coast AQMD to establish an Off-road Equipment Replacement Program that provides free consultations to fleet operators and offers support for accessing rebates and incentives.

As an initial performance standard, the City will monitor that the phased ordinance is implemented by 2027 following local adoption. To assess its effectiveness in reducing GHG emissions, the City will monitor the community's participation in the Off-road Equipment Replacement Program, established under **Action T-5e**. The following subsection details the methodology, assumptions, and calculations used to substantiate the estimated reduction in off-road fuel usage (i.e., avoided and replaced) resulting from the implementation of **Action T-5a**.

Actions T-5a, T-5d, and T-5e Substantiation – Off-road Phased Ordinance, Incentives, and Replacement Program

ASSERTION

The ordinance established under **Action T-5a** will enforce the use of R99 and R100 renewable diesel per CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation requirements and enforce CARB's SORE regulations. Compliance with the ordinance will be supported by public outreach under **Action T-5d** and by the Off-road Equipment Replacement Program under **Action T-5e**. Due to the expected decrease in off-road fossil fuel usage through these combined efforts, it is assumed that **Action T-5a** will result in an estimated 30 percent reduction in the community's overall off-road fossil fuel usage by 2030.

[125] South Coast Air Quality Management District (AQMD). Electric Lawn and Garden Programs. Accessed at: https://www.aqmd.gov/home/programs/community/electric-lawn-and-garden-programs
[126] South Coast AQMD. The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program). Accessed at: https://www.aqmd.gov/home/programs/business/carl-moyer-memorial-air-quality-standards-attainment-(carl-moyer)-program
[127] California Air Resources Board (CARB). Clean Off-Road Equipment Vouchers. Accessed at: https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project

EVIDENCE

Action T-5a's ordinance will reduce off-road emissions by requiring the use of R99 and R100 renewable diesel per CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation.[128] Effective January 1, 2024, all California fleets subject to this regulation must use R99 or R100 renewable diesel in self-propelled off-road diesel vehicles over 25 horsepower. The regulation has limited exceptions including exceptions for locomotives, marine vessels, and personal-use vehicles.[129] Taking into account these exceptions, full compliance with this regulation would effectively replace 80 percent of applicable fossil diesel consumption with renewable diesel by 2030.[130] The quantification conservatively assumes only 50 percent of the applicable off-road diesel will be replaced. Since renewable diesel's emissions factor is approximately 70 percent lower than fossil diesel's emissions factor, this transition will significantly reduce off-road emissions.[131] The renewable diesel quantification applies only to non-SORE diesel fuel usage to avoid double counting the GHG emissions reduction from SORE diesel fuel usage replacement.

Action T-5a's ordinance will further reduce off-road emissions by aligning with CARB's SORE regulations. The regulations apply to SORE which consist of off-road spark-ignition engines that produce 19 kilowatts gross power or less (aka. 25 horsepower or less). The regulations mandate that all newly manufactured SORE must be zero-emission starting in 2024, with a full transition to zero-emission equipment by 2035.[132] Implementation of the regulations began with most of the 2025 model year.[133] In 2030, gasoline and diesel used by SORE will comprise 11 percent of the off-road vehicle and fuel use in Moreno Valley.[134] With a median lifespan of five years,[135] the ordinance has the potential to eliminate this entire portion as most SORE will need replacement between 2025 and 2030. However, the quantification targets only 70 percent of the community's applicable SORE fuel consumption to reflect the ordinance's focus on SORE sales rather than operation.

Compliance with the ordinance and CARB regulations will be supported by public outreach under **Action T-5d**, which will inform contractors, residents, and off-road fleet owners in Moreno Valley, including landscapers, about the benefits of zero-emission off-road equipment, as well as available funding opportunities. The City will work with South Coast AQMD to promote rebates offered

[128] California Air Resources Board (CARB). In-Use Off-Road Diesel-Fueled Fleets Regulation. Accessed at: https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation

[129] CARB. (2022). Final Regulation Order Amendments to Sections 2449, 2449.1, and 2449.2 Title 12, California Code of Regulations. Accessed at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/froa-1.pdf

[130] The regulation's impact on Moreno Valley's 2030 off-road diesel fuel consumption was estimated by filtering CARB OFFROAD2021 model outputs (for Riverside County in 2030) for horsepower ratings greater than 25 and for equipment types applicable under the regulation (i.e., filtered out fuel usage by exempt equipment types); and attributing the resulting County-level annual diesel fuel usage to Moreno Valley based on the attribution methodology used in the GHG inventory and forecast. The results were divided by the total estimated off-road diesel fuel usage in Moreno Valley in 2030 to estimate the share, or percentage, of diesel fuel usage applicable under CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation amendments. The quantification assumes full compliance with the regulation, since the use of renewable diesel does not require new equipment, but rather availability of the renewable diesel fuel.

[131] CARB staff has reached out to several renewable diesel fuel producers and as of February 2023, is aware that renewable diesel produced by Neste meets the regulatory requirements and standards. Estimates in GHG emissions reduction based on emission factors provided by Neste accessed at: https://www.neste.com/en-us/products-and-innovation/neste-my-renewable-diesel/product-information

[132] CARB. Small Off-road Engine (SORE) Regulations (2023). Accessed at: https://ww2.arb.ca.gov/our-work/programs/small-off-road-engines-sore

[133] U.S. EPA granted CARB an authorization to waive federal preemption for its current SORE regulations. CARB will implement the regulations for the remainder of the 2025 model year, after the waiver, and fully implement the regulations beginning with the 2026 model year.

[134] Moreno Valley's SORE fuel usage in 2030 was estimated by filtering CARB OFFROAD2021 model outputs (for Riverside County in 2030) for horsepower ratings less than or less than 25 and attributing the resulting County-level annual fuel usage to Moreno Valley based on the attribution methodology used in the GHG inventory and forecast. The results were divided by the total estimated off-road fuel usage in Moreno Valley in 2030 to estimate the share, or percentage, of fuel usage attributable to SOREs.

[135] CARB. 2020 Emissions Model for Small Off-Road Engines – SORE2020 (2020). Table 16. Accessed at: https://ww2.arb.ca.gov/sites/default/files/2020-09/SORE2020_Technical_Documentation_2020_09_09_Final_Cleaned_ADA.pdf

through their Residential and Commercial Electric Lawn and Garden Equipment Rebate Programs[136] and Carl Moyer Program,[137] as well as promote the availability of CARB's Clean Off-Road Equipment Voucher Incentive Program.[138] Compliance will be further supported by the Off-road Equipment Replacement Program established under **Action T-5e**, which will provide free consultations to fleet operators, connect them with rebates and incentives, and link operators to local repair services capable of maintaining new equipment.

Together, the GHG emissions reduction from the phased ordinance accounts for about a 30 percent reduction in total off-road fuel consumption and GHG emissions by 2030. The equations used to quantify this action are detailed in Equations 11 through 11.3 and details regarding assumptions, parameters, and calculation results are detailed in Table 32 and Table 33 in Section 8.

[136] South Coast AQMD. Residential Electric Lawn & Garden Equipment Rebate Program. Accessed at: https://www.aqmd.gov/home/programs/community/electric-lawn-and-garden-programs/electric-lawn-mower-rebate-program
[137] South Coast AQMD. The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program). Accessed at: https://www.aqmd.gov/home/programs/business/carl-moyer-memorial-air-quality-standards-attainment-(carl-moyer)-program
[138] CARB. Clean Off-road Equipment Vouchers. Accessed at: https://ww2.arb.ca.gov/our-work/programs/clean-off-road-equipment-voucher-incentive-project

5 Strategy SW: Solid Waste

Table 9 Strategy SW: Solid Waste GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy SW: Solid Waste			
SW-1	Achieve, monitor, and maintain SB 1383 (2016) requirements to reduce waste sent to landfills by 75% below 2014 levels by 2030.	195,661	282,198
Total		**195,661**	**282,198**

Note: MT CO_2e = metric tons of carbon dioxide equivalent.

SW-1: Achieve, monitor, and maintain SB 1383 (2016) requirements to reduce waste sent to landfills by 75% below 2014 levels by 2030.

Measure SW-1 aims for Moreno Valley to meet SB 1383 (2016) requirements to recover 20 percent of disposed edible food for human consumption and reduce landfilled organic waste—and its associated GHG emissions—75 percent by 2030, compared to 2014 levels. The primary Actions that enable this Measure include:

- **Action SW-1a** which commits the City to partner with Waste Management to conduct annual community waste characterization studies to determine organic waste landfill and diversion rates and track community progress on SB 1383 (2016) compliance;
- **Action SW-1b** which directs the City to review its existing waste hauler franchise agreement(s) with Waste Management and amend as needed to include SB 1383 (2016) organic waste diversion compliance. The agreement will include:
  - Adding a new SB 1383 (2016) fee to provide a sustainable revenue source for a new full- or part-time City staff person to manage organic waste diversion programs;
  - Implementing enforcement and fees for incorrectly sorted materials;
  - Conducting quarterly meetings between Waste Management and the City to review progress reports, the annual waste characterization results, and establish prioritized actions, as needed, for Waste Management to implement to improve SB 1383 (2016) compliance;
  - Adding organics collection and recycling bins and service to public areas, where needed;
  - Distributing free food scrap collection pails to single-family and multi-family residences; and,
  - Distributing informational material to Waste Management customers to educate community members on the availability of curbside composting services and proper disposal methods to reduce contamination.
- **Action SW-1c** which commits the City to work with the Riverside County Department of Waste Resources to educate Moreno Valley community members on organic waste diversion and recycling.

To monitor the progress toward compliance with SB 1383 (2016) diversion requirements, the City will work with Waste Management to monitor organics diversion rates and meet with them quarterly to track progress and adjust efforts, as needed, to improve SB 1383 (2016) compliance.

Measure SW-1 Substantiation – Organic Waste Diversion Program

ASSERTION

Implementing **Actions SW-1a**, **SW-1b**, and **SW-1c** will align Moreno Valley with the activities CalRecycle requires jurisdictions to conduct to comply with SB 1383 (2016) diversion requirements. Meeting these requirements will allow Moreno Valley to reduce landfilled organic waste and associated solid waste GHG emissions 75 percent below 2014 levels by 2030.

EVIDENCE

Nearly all GHG emissions from the natural decay of solid waste in landfills come from organic waste.[139] Due to this direct impact on GHG emissions, SB 1383 (2016) requires a 75 percent reduction in landfilled organic waste by 2030, compared to 2014 levels. CalRecycle outlines the activities jurisdictions are required to conduct to comply with SB 1383 (2016). These activities include:

- Collection: “Jurisdictions are required to provide organic waste collection to all residents and businesses, which means providing service automatically and not relying on the generator to subscribe.”
- Education and Outreach: “Jurisdictions are required to conduct education and outreach to all affected parties, including generators, edible food recovery organizations, and city/county department staff.”
- Capacity Planning: “Jurisdictions are required to evaluate the jurisdiction’s readiness and capacity to implement SB 1383, including organics collection and recycling and edible food recovery capacity.”
- Enforcement: “Starting January 1, 2022, jurisdictions are required to conduct inspections and enforce compliance with SB 1383. Jurisdictions are required to adopt an ordinance or enforceable mechanism consistent with SB 1383 requirements by January 1, 2022.”
- Recordkeeping and Reporting: “Jurisdictions are required to maintaining accurate and timely records of SB 1383 compliance and reporting.” [140]

Moreno Valley will meet these requirements by implementing **Action SW-1b**. The Action directs the City to provide organic waste collection to all residents and businesses (Collection). Since 2023, Moreno Valley has provided organic waste collection to nearly all residents and businesses with only a 0.57 percent noncompliance rate for multi-family accounts and a 1.25 percent noncompliance rate for commercial accounts.[141] Moreno Valley will work to minimize these noncompliance rates and minimize verified exemptions to increase collection activities through education and enforcement. Action SW-1b also directs the City to hire a new full- or part-time City staff person to manage organic waste diversion programs (Capacity Planning), implement enforcement and fees for incorrectly sorted materials (Enforcement), conduct quarterly meetings between Waste Management and the City to review progress reports and the annual waste characterization results (Recordkeeping and Reporting), and distribute informational material to Waste Management customers to educate community members on the availability of curbside composting services and proper disposal methods to reduce contamination (Education and Outreach). Jurisdictions that have struggled to meet SB 1383 (2016) requirements face challenges related to lack of infrastructure, funding, and education.[142] The activities required by CalRecycle address these key components. By implementing them through **Action SW-1b**, it is reasonable to assume that Moreno Valley will meet

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[139] According to the Local Governments for Sustainability (ICLEI) U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Appendix E – Solid Waste Emission Activities and Sources, GHG emissions are generated by non-biologic wastes only if they are combusted.

[140] CalRecycle. SB 1383 Jurisdiction Responsibilities. Accessed at: https://www2.calrecycle.ca.gov/Docs/Web/119160#:~:text=Beginning%20in%202022%2C%20SB%201383,is%20automatically%20provided%20the%20service

[141] Waste Management. 2023 and 2024 SB 1382 Compliance Reports.

[142] Waste Dive. California’s Organics Diversion Mandate Enters its ‘adolescent age,’ Updated with New Laws (2024). Accessed at: https://www.wastedive.com/news/sb-1383-laws-changes-procurement-collection-requirements/727990/#:~:text=SB%201383%20enacted%20several%20deadlines,providing%20new%20assistance%20to%20composters.

SB 1383's (2016) requirements to achieve a 75 percent reduction in landfilled organic waste by 2030.

This level of landfilled organic waste reduction is expected to directly reduce solid waste disposal GHG emissions by 75 percent because nearly all GHG emissions from the natural decay of solid waste in landfills come from organic waste.[143] To quantify the emissions reductions, the analysis compares forecasted 2030 solid waste emissions to 2014 baseline emissions, ensuring alignment with SB 1383's (2016) targets. The equations used to quantify this action are detailed in Equations 12 through 12.1 and details regarding assumptions, parameters, and calculation results are detailed in Table 34 and Table 35 in Section 8.

[143] According to the Local Governments for Sustainability (ICLEI) U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Appendix E – Solid Waste Emission Activities and Sources, GHG emissions are generated by non-biologic wastes only if they are combusted.

6 Strategy WW: Water and Wastewater

Table 10 Strategy WW: Water and Wastewater GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy WW: Water and Wastewater			
WW-1	Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.	Supportive	Supportive
Total		**0**	**0**

Note: MT CO_2e = metric tons of carbon dioxide equivalent.

WW-1 (supportive): Work with the Eastern Municipal Water District and Box Springs Mutual Water Company to reduce per capita potable water consumption.

Measure WW-1 focuses on partnering with the Eastern Municipal Water District (EMWD) and Box Springs Mutual Water Company (BSMWC) to reduce per capita potable water consumption in Moreno Valley. This Measure includes:

- Supporting EMWD in updating their Urban Water Management Plan (UWMP) every five years, which will outline demand reduction actions in line with the State's "Making Water Conservation a Way of Life" regulations;[144]
- Collaborating with EMWD and BSMWC to develop and expand water conservation programs and outreach efforts for the community; and,
- Assessing the feasibility of expanding the recycled water system within Moreno Valley to increase the use of non-potable water for irrigation and other purposes.

Through Actions such as enforcing water waste restrictions, engaging large water users to develop On-Site Water Reuse Plans, updating the Model Water Efficient Landscape Ordinance, promoting dual-plumbing systems, and expanding community education on water conservation incentives, this Measure aims to foster long-term sustainable water use practices in the City.

Although Measure WW-1 contributes to reducing energy consumption associated with water treatment and distribution, the resulting GHG emissions reductions are *not quantified*. This is due to the interconnected relationship between water and energy use, where reductions in water-related energy consumption are already reflected in Moreno Valley's Building Energy sector measures. Quantifying these reductions separately would risk double counting, as the State's transition to renewable and carbon-free electricity—captured in the city's adjusted GHG emissions forecast—also accounts for the decarbonization of energy used in water processes. Despite this, Measure WW-1 plays a vital role in supporting the City's water conservation goals and enhancing local water security.

[144] California State Water Resources Control Board. Making Conservation a California Way of Life Regulation. Accessed at: https://www.waterboards.ca.gov/conservation/regs/water_efficiency_legislation.html

7 Strategy CS: Carbon Sequestration

Table 11 Strategy CS: Carbon Sequestration GHG Emissions Reduction Summary

Measure ID	Measure	2030 GHG Emissions Reduction [MT CO_2e]	2045 GHG Emissions Reduction [MT CO_2e]
Strategy CS: Carbon Sequestration			
CS-1	Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve SB 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.	4,424	6,025
CS-2	Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.	106	1,487
Total		**4,530**	**7,512**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent. Values may not add up to totals due to rounding.

CS-1: Increase carbon sequestration in the community by procuring and distributing compost within the community to achieve SB 1383 (2016) procurement requirements (i.e., 0.08 tons recovered organic waste per person) by 2030 and maintain them through 2045.

Measure CS-1 puts Moreno Valley on a path to meet its SB 1383 (2016) procurement target by 2030 and maintain it thereafter. The primary Actions that enable this Measure include:

- **Action CS-1a** which directs the City to enhance compost application to comply with SB 1383 (2016) through:
  - Enforcing compliance with SB 1383 (2016) in Moreno Valley by establishing a minimum annual level of compost application on public and private lands, aiming to exceed baseline requirements;
  - Maintaining procurement policies to purchase recovered organic waste products, including compost, in accordance with SB 1383 (2016) requirements; and,
  - Continuing the regional compost broker program in partnership with Waste Management, Zero Foodprint, and the Western Riverside Council of Governments' (WRCOG) Solid Waste Cooperative.
- **Action CS-1b** which directs the City to collaborate with Waste Management and the Riverside County Department of Waste Resources to create and distribute promotional materials and educational resources to residents, businesses, and developers on the benefits of compost use, where compost can be obtained (including the free compost offered by the Riverside County Department of Waste Resources at the Lamb Canyon Landfill and Badlands Landfill), and how it can be applied effectively in landscaping and agricultural projects;
- **Action CS-1d** which directs the City to conduct a study to identify applicable locations (including City-owned properties, schools, and open spaces) and the quantity of compost that can be applied within the community to help meet the procurement requirements of SB 1383 (2016);
- **Action CS-1e** which directs the City to dedicate staff time and resources to researching pathways for maintaining SB 1383 (2016) compliance and applying the compost to lands within the community, including exploring grant funding opportunities for compost procurement and distribution incentive programs; and,
- **Action CS-1f** which directs the City to use the regional compost broker program to distribute compost within Moreno Valley.

To monitor progress toward achieving their annual procurement targets and determine compliance with SB 1383 (2016) requirements, the City will continue to monitor the tons of organics procured and distributed to the community.

Measure CS-1 Substantiation – SB 1383 (2016) Procurement Requirements and Application

ASSERTION

Implementing **Actions CS-1a**, **CS-1b**, **CS-1d**, **CS-1e, and CS-1f** will allow Moreno Valley to establish the supply, procurement, and distribution of compost to meet its annual SB 1383 (2016) procurement target of 0.08 tons of recovered organic waste per person by 2030 and apply the compost to lands within the community. Application of compost enhances carbon sequestration of soils.

EVIDENCE

SB 1383 (2016) requires that all California jurisdictions procure recovered organic waste products to meet annual targets set by CalRecycle.[145] These products include compost, mulch, renewable energy from anaerobic digestion (such as transportation fuel, electricity, and gas for heating), and electricity generated from biomass conversion. While jurisdictions have flexibility in how they meet their targets, Moreno Valley plans to focus on compost procurement to capitalize on its carbon sequestration benefits. In 2023 and 2024, Moreno Valley achieved its compost procurement targets with Zero Foodprint's Compost Connector Program and Waste Management. In 2023, it procured 3,057.81 tons of compost.[146] This satisfied AB 1985's (2022) requirement that jurisdictions achieve 30 percent of their procurement target by 2023. In 2024, Moreno Valley procured 6,318.42 tons of compost.[147] This satisfied AB 1985's (2022) requirement that jurisdictions achieve 65 percent of their procurement target by 2024. Moreno Valley will continue these successes, with support from **Actions CS-1a's** compost broker program and **CS-1e's** City staff time and resources, to achieve 100 percent of its SB 1383 (2016) procurement target by 2025 and maintain it through 2030.

By 2030, the City will also facilitate distribution of the procured compost to apply it to lands within the community for carbon sequestration. According to CARB, compost application sequesters on average 0.23 MT CO_2e per organic waste ton.[148] **Action CS-1d** will guide the identification of locations within the community to apply compost for carbon sequestration benefits. Potential locations include parks, sports fields, medians, public schools, community gardens, public landscaping, and open spaces. Supported by **Action CS-1e**'s City staff time and resources, **Action CS-1f** will work to enhance the compost broker program to distribute compost within the community for application at the identified locations. **Action CS-1b**'s outreach and education efforts will further promote compost use among residents, businesses, and developers within the community. These outreach and education efforts will promote existing compost distribution efforts at the Riverside County landfills (including the Badlands Landfill in Moreno Valley)[149] as well as the new compost distribution efforts. These combined actions position Moreno Valley to meet its SB 1383 (2016) procurement goals while enhancing carbon sequestration throughout the community. The equations used to quantify this action are detailed in Equations 13 through 13.1 and details regarding assumptions, parameters, and calculation results are detailed in Table 36 and Table 37 in Section 8.

[145] CalRecycle. Procurement Targets and Recovered Organic Waste Products. Accessed at: https://calrecycle.ca.gov/organics/slcp/procurement/recoveredorganicwasteproducts/
[146] Zero Foodprint. City of Moreno Valley 2023 Procurement Report (2024).
[147] Waste Management. City of Moreno Valley 2024 Procurement Report.
[148] CARB. Method for Estimating Greenhouse Gas Emission Reductions from Diversion of Organic Waste from Landfills to Compost Facilities (2017). Accessed at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/waste/cerffinal.pdf.
[149] Riverside County Department of Waste Resources. Free Compost at RivCo Landfills. Accessed at: https://rcwaste.org/community-outreach/free-compost

CS-2: Increase carbon sequestration by preserving existing mature trees and planting and maintaining 200 new trees per year, beginning in 2026.

Measure CS-2 aims for Moreno Valley to preserve existing trees and plant and maintain 200 new trees per year, beginning in 2026. The primary Actions that enable this Measure include:

- **Action CS-2a** which directs the City to develop an Urban Forest Master Plan aimed at promoting tree health, enhancing urban resilience, and increasing the co-benefits of tree planting and shading, including urban heat relief. As part of the master plan:
  - Use the Tree Equity Score or conduct an urban tree canopy study to establish a baseline of current canopy coverage by census block, set a percentage coverage goal for each census block, and identify priority planting areas to plant a minimum of 200 new trees per year beginning in 2026;
  - Align the plan with Moreno Valley's Tree Care ordinance by integrating urban heat island mitigation strategies into the master plan and prioritizing tree species that are indigenous to the area and/or suitable for the local climate; and,
  - Establish a monitoring plan to regularly review the Tree Equity Score or conduct a new urban tree canopy study to assess progress.
- **Action CS-2b** which directs the City to continue to enforce the tree maintenance and protection policies in Moreno Valley's Tree Care ordinance, including the financial penalties for violations with the ordinance; and,

The City will track progress toward tree planting goals established in the Measure by annual monitoring of the number of trees planted and removed from urban tree stock. Additional performance standards include the successful development and implementation of the Urban Forest Master Plan.

Measure CS-2 Substantiation – Urban Forest Master Plan

ASSERTION

Implementing **Action CS-2a**'s Urban Forest Master Plan will guide Moreno Valley's efforts to plant a minimum of 200 new trees per year starting in 2026 and guide their long-term maintenance, as required by **Action CS-2b**'s continued implementation of the City's Tree Care ordinance. This steady increase in the urban tree canopy will increase carbon sequestration year over year.

EVIDENCE

Carbon sequestration quantification and tracking is a developing field, with ongoing efforts to refine methodologies. While carbon sequestration will be vital in achieving both the State's and Moreno Valley's carbon neutrality goals, many communities, including Moreno Valley, are adopting a conservative approach to quantification until more definitive guidance from the State becomes available. AB 1757 (2022) requires the California Natural Resources Agency to establish carbon sequestration targets by 2024 and develop tracking methodologies by 2025.[150] Once these targets and methods are finalized, the City will incorporate them into this Measure and its associated Actions, updating **Action CS-2a**'s Urban Forest Master Plan, as needed.

[150] CARB. Assembly Bill 1757 (2022). Accessed at: https://ww2.arb.ca.gov/2022-assembly-bill-1757-garcia-cristina-california-global-warming-solutions-act-2006-climate-goal

By establishing clear tree planting targets and identifying priority areas using the Tree Equity Score, **Action CS-2a**'s Urban Forest Master Plan will provide a structured approach to expanding Moreno Valley's tree canopy by 200 trees per year. California cities including Oakland,[151] Fremont,[152] and many more recently adopted Urban Forest Master Plans with equity analyses to increase their urban forests. The trees in Moreno Valley will be maintained through the Urban Forest Master Plan's focus on the ongoing maintenance and retention of trees and **Action CS-2b**'s enforcement of the City's Tree Care ordinance. Trees sequester carbon by absorbing it from the atmosphere through photosynthesis and storing it in their tissue. They sequester carbon each year, adding to the cumulative carbon stock—or total stored carbon over a specific period—of the urban forest. Thus, by focusing on tree plantings and maintenance, the City will increase carbon sequestration within the community.

The quantification applies the average annual carbon sequestration rate of trees (i.e., 0.0354 MT CO_2e per year)[153] to estimate the cumulative carbon sequestration expected from the 200 new trees planted each year. While existing trees also sequester carbon, the GHG emissions reduction of this Measure is only estimated based on the cumulative carbon sequestration benefits of tree plantings to remain conservative. The equations used to quantify this action are detailed in Equations 14 through 14.2 and details regarding assumptions, parameters, and calculation results are detailed in Table 38 and Table 39 in Section 8.

151 City of Oakland. Oakland Urban Forest Plan. Accessed at: https://www.oaklandca.gov/projects/oakland-urban-forest-plan.

152 City of Fremont. Primary Framework: Urban Forest Management Plan (2023). Accessed at: https://www.fremont.gov/home/showpublisheddocument/14603/638381633196370000.

153 California Air Pollution Control Officers Association (CAPCOA). Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerability, and Advancing Health and Equity (2024). Accessed at: https://www.caleemod.com/documents/handbook/full_handbook.pdf.

8 Parameters, Data Sources, and Calculations

8.1 Measure BE-1 Parameters, Data Sources, and Calculations

Renewable Energy Procurement Equations

Equation 1 $CO_2e\ Reduction_{Elec,y,i} = Total\ Elec_{MVU,y,i} * (EF_{weighted\text{-}elec,y,i} - EF_{elec,MVU,y})$

Equation 1.1 $Total\ Elec_{MVU,y,i} = Elec_{forecasted,new,y,i} + Elec_{convert,new,y,i} + (Elec_{forecasted,existing,y,i} + Elec_{forecasted,EV\ usage,y,i} + Elec_{convert,existing,y,i} + Elec_{convert,EV\ usage,y,i}) * MVU\ Allocation_i$

Equation 1.2 $EF_{elec,MVU,y} = EF_{elec,MVU,by} / (1 - Renewable\ Share_{by}) * (1 - Renewable\ Share_y)$

Table 12 Renewable Energy Procurement Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 1				
$CO_2e\ Reduction_{Elec,y,i}$	Electricity GHG emission reductions	See Table 13	MT CO_2e	Calculated
$Total\ Elec_{MVU,y,i}$	Total MVU electricity consumption	See Table 13	kWh	Calculated
$EF_{weighted\text{-}elec,y,i}$	Weighted forecasted electricity emissions factor by sector	See Table 13	MT CO_2e/kWh	Calculated
$EF_{elec,MVU,y}$	MVU target emission factor	See Table 13	MT CO_2e/kWh	Calculated
y	Target year	2030 or 2045	year	City identified
i	Subsector	Residential or Nonresidential	—	—
Equation 1.1				
$Elec_{forecasted,new,y,i}$	Forecasted electricity from new buildings, including transmission and distribution losses[1]	See Table 13	kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Elec_{convert,new,y,i}$	Electricity from new building conversion (Measure BE-3 and BE-4), including transmission and distribution losses[1]	See Table 13	kWh	Calculated
$Elec_{forecasted,existing,y,i}$	Forecasted electricity from existing buildings, including transmission and distribution losses	See Table 13	kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets

Variable	Definition	Value	Unit	Data Source
$Elec_{forecasted,EV\ usage,y,i}$	Forecasted electricity from EVs, including transmission and distribution losses	See Table 13	kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Elec_{convert,existing,y,i}$	Electricity from existing building conversion (Measure BE-5 and BE-6), including transmission and distribution losses	See Table 13	kWh	Calculated
$Elec_{convert,EV\ usage,y,i}$	Electricity from vehicle conversion (Measure T-3), including transmission and distribution losses	See Table 13	kWh	Calculated
MVU Allocation	Share of electricity from MVU by sector	See below	percentage	—
	Share of residential electricity from MVU	10%	percentage	Calculated from 2019 data provided by SCE and MVU, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
	Share of nonresidential electricity from MVU	37%	percentage	Calculated from 2019 data provided by SCE and MVU, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 1.2				
$EF_{elec,MVU,by}$	MVU emission factor in baseline year	0.0002853	MT CO_2e/kWh	California Energy Commission,[2] consistent with GHG Inventory (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory)
$Renewable\ Share_{by}$	Share of MVU electricity sourced from renewables in baseline year	33%	percentage	California Energy Commission,[2] consistent with GHG Inventory (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory)
$Renewable\ Share_{y}$	Share of MVU electricity sourced from renewables in target year	See below	percentage	City identified

Variable	Definition	Value	Unit	Data Source
	Share of MVU electricity sourced from renewables (2030)	70%	percentage	Measure BE-1 implementation target enabled by Integrated Resources Plan to exceed SB 100 (2018) and SB 1020 (2022) Renewable Portfolio Standard requirements (i.e., 60% renewable electricity by 2030).
	Share of MVU electricity sourced from renewables (2045)	100%	percentage	Measure BE-1 implementation target. Aligns with State's SB 100 (2018) Renewable Portfolio Standard requirements.
by	Baseline year	2019	year	City identified; Appendix B: 2019 Community Greenhouse Gas Emissions Inventory

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; kWh = kilowatt-hour, EV = electric vehicle, MVU = Moreno Valley Electric Utility; SB = Senate Bill; SCE = Southern California Edison.

[1] All new electricity customers in Moreno Valley are serviced by MVU.

[2] California Energy Commission (CEC). 2019 Power Content Label: City of Moreno Valley (2020). Accessed at: https://www.energy.ca.gov/filebrowser/download/3265

Table 13 Renewable Energy Procurement GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045[1]
Equation 1.1					
$Elec_{y,i}$	Forecasted electricity consumption	kWh	Residential	41,659,804	48,686,195
			Nonresidential	91,093,980	135,359,852
$Elec_{forecasted,new}$	Forecasted electricity from new buildings, including transmission and distribution losses	kWh	Residential	104,623,119	247,291,009
			Nonresidential	119,904,574	283,410,810
$Elec_{convert,new}$	Electricity from new building conversion (Measure BE-3 and BE-4), including transmission and distribution losses	kWh	Residential	39,381,857	187,063,822
			Nonresidential	10,481,960	49,789,308
$Elec_{forecasted,existing}$	Forecasted electricity from existing buildings, including transmission and distribution losses	kWh	Residential	406,807,210	406,807,210
			Nonresidential	339,404,438	339,404,438
$Elec_{forecasted,EV\ usage}$	Forecasted electricity from EVs, including transmission and distribution losses	kWh	Residential	51,590,409	94,618,239
			Nonresidential	9,214,572	57,188,013
$Elec_{convert,existing}$	Electricity from existing building conversion (Measure BE-5 and BE-6), including transmission and distribution losses	kWh	Residential	21,177,659	91,091,960
			Nonresidential	3,008,988	14,292,694
		kWh	Residential	162,259,423	726,217,370

Variable	Definition	Units	Sector	2030	2045[1]
$Elec_{convert,EV\ usage}$	Electricity from vehicle conversion (Measure T-4), including transmission and distribution losses		Nonresidential	20,239,984	228,570,015
Total ElecMVU,y,i	Total MVU electricity consumption	kWh	Residential	210,367,631	570,705,734
			Nonresidential	269,039,357	571,624,150
Equation 1.2					
$EF_{elec,MVU,y}$	MVU target emission factor	MT CO_2e/kWh	Residential	0.000129	0.000000
			Nonresidential	0.000129	0.000000
Equation 1					
$EF_{weighted\text{-}elec,y,i}$	Weighted forecasted electricity emissions factor by sector	MT CO_2e/kWh	Residential	0.000152	0.000000
			Nonresidential	0.000160	0.000000
CO_2e Reduction$_{Elec,y,i}$	**Electricity GHG emission reductions**	**MT CO_2e/kWh**	**Residential**	**4,860**	**0**
			Nonresidential	**8,538**	**0**

Notes:
[1] SB 100 requires the State's electricity sector to achieve 100% renewable and zero-carbon electricity by 2045. By that time, the electricity emission factor will be 0 MTCO_2e/kWh. As estimated emissions reductions are based on reductions applicable in the target year, as opposed to cumulative GHG emissions reductions, this results in no additional reductions in 2045 beyond the State-mandated baseline.

kWh = kilowatt-hours; MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; EV = electric vehicle; MVU = Moreno Valley Electric Utility.

8.2 Measure BE-2 & BE-3 Parameters, Data Sources, and Calculations

All-electric New Construction Equations

Equation 2 $CO_2e\ Reduction_{NG,y,i}=(Fuel\ Avoided_{NG,y,i}*EF_{NG})+(Fuel\ Avoided_{NGL,y,i}*EF_{NGL})-(Elec\ Convert_{y,i}*EF_{elec,y,i})$

Equation 2.1 $Fuel\ Avoided_{NG,y,i} = (Fuel_{NG,y,i}-Fuel_{NG,imp.yi})*\%Imp_i$

Equation 2.2 $Fuel\ Avoided_{NGL,y,i}=Fuel\ Avoided_{NG,y,i}/(1-L_{NGL,end\text{-}use})*(L_{NGL,end\text{-}use}+L_{NGL,pipeline})$

Equation 2.3 $Elec_{convert,y,i} = Fuel_{\ AvoidedNG,y,i}*(CF_{elec}/Eff_{elec})*(1+L_{T\&D})$

Table 14 All-electric New Construction Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 2				
CO2e Reduction$_{NG,y,i}$	Natural gas GHG emissions reduction	See Table 15	MT CO_2e	Calculated
Fuel Avoided$_{NG,y,i}$	Natural gas consumption avoided	See Table 15	therms	Calculated
EF_{NG}	Natural gas emission factor	0.005311	MT CO_2e/therm	EPA's Emission Factor Hub,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Variable	Definition	Value	Unit	Data Source
Fuel Avoided$_{NGL,y,i}$	Natural gas leakage avoided	See Table 15	therms	Calculated
EF_{NGL}	Natural gas leakage emission factor	0.047381	MT CO_2e/therm	2.85 m^3/therm * 95% methane content * 0.7 kg/m^3 * 25 * 0.001 MT/kg, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Elec Converted$_{y,i}$	Electricity usage from conversion	See Table 15	kWh	Calculated
$Ef_{elec,y,i}$	Forecasted electricity emission factor	See Table 15	MT CO_2e/kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
y	Target year	2030 or 2045	year	City identified
i	Subsector	Residential or Nonresidential	—	—
Equation 2.1				
$Fuel_{NG,y,i}$	Forecasted natural gas consumption	See Table 15	therms	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Fuel_{NG,imp.y}$	Forecasted natural gas in implementation year	See Table 15	therms	Calculated
$imp.y_i$	Ordinance implementation year	See below	year	City identified
$imp.y_{residential}$	Ordinance implementation year (residential)	2026	year	Measure BE-3 implementation target
$imp.y_{nonresidential}$	Ordinance implementation year (nonresidential)	2026	year	Measure BE-4 implementation target
$\%Imp_i$	Effective percent of ordinance implementation	See below	percentage	City identified
$\%Imp_{residential}$	Effective percent of ordinance implementation (residential)	95%	percentage	Assumed due to cost-effectiveness of all-electric buildings under ordinance's Energy Design Rating (EDR) due to energy efficiency of electric appliances, low GHG-intensity of electricity, and developers' dependence on material and energy costs.[2,3] Excludes construction that may face technological or infrastructural barriers to electrification.
$\%Imp_{nonresidential}$	Effective percent of ordinance implementation (nonresidential)	95%	percentage	
Equation 2.2				

Variable	Definition	Value	Unit	Data Source
$L_{NGL,end-use}$	Natural gas end-use leakage percentage	0.5%	percentage	Environmental Defense Fund,[4] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$L_{NGL,pipeline}$	Natural gas pipeline leakage percentage	2.3%	percentage	Alvarez, Ramón et al.,[5] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 2.3				
CF_{elec}	Electricity to therms conversion factor	29.3	kWh/therm	Metric Conversions[6]
Eff_{elec}	Efficiency factor of electric equipment relative to natural gas equipment	3	unitless	European Copper Institute[7]
$L_{T\&D}$	Electricity transmission and distribution loss percentage	5.1%	percentage	EPA's eGRID Data Explorer,[8] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; m^3 = cubic meter; kg = kilogram; MT = metric ton.

[1] U.S. Environmental Protection Agency (EPA). GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

[2] DesignHorizons Team. 2024. Construction Pricing: Factors, Costs, and Methods Explained. Accessed at: https://designhorizons.org/construction-pricing-factors-costs-and-methods-explained/

[3] Construction Management Association of America. Member Communications Experience, Construction Estimating: Everything You Need to Know. Accessed at: https://www.cmaanet.org/sites/default/files/resource/Construction%20Estimating_0.pdf

[4] Environmental Defense Fund (EDF). USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Accessed at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[5] Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. https://www.science.org/doi/abs/10.1126/science.aar7204

[6] Metric Conversions. Therms (US) to Kilowatt-hours.

[7] European Copper Institute. Heat Pumps: Integrating technologies to decarbonise heating and cooling (2018). Accessed at: https://www.ehpa.org/wp-content/uploads/2022/10/White_Paper_Heat_pumps-1.pdf.

[8] EPA. Data Explorer, grid gross loss rates, 2019. Accessed at: https://www.epa.gov/egrid/data-explorer

Table 15 All-electric New Construction GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045
Equation 2.1					
$Fuel_{NG,y,i}$	Forecasted natural gas consumption	therms	Residential	32,929,849	48,074,343
			Nonresidential	8,813,082	12,843,973
$Fuel_{NG,imp,y}$	Forecasted natural gas in implementation year	therms	Residential	28,891,317	28,891,317
			Nonresidential	7,738,178	7,738,178
$Fuel\ Avoided_{NG,y,i}$	Natural gas consumption avoided	therms	Residential	3,836,605	18,223,875
			Nonresidential	1,021,159	4,850,506
Equation 2.2					

Fuel Avoided$_{NGL,y,i}$	Natural gas leakage avoided	therms	Residential	107,965	512,833
			Nonresidential	28,736	136,497
Equation 2.3					
Elec Converted$_{y,i}$	Electricity usage from conversion	kWh	Residential	39,381,857	187,063,822
			Nonresidential	10,481,960	49,789,308
Equation 2					
EF$_{elec,y,i}$	Forecasted electricity emission factor	MT CO_2e/kWh	Residential	0.0001516	0.00
			Nonresidential	0.0001603	0.00
CO_2e Reduction$_{NG,y,i}$	**Natural gas GHG emissions reduction**	**MT CO_2e**	**Residential**	**19,522**	**121,094**
			Nonresidential	**5,106**	**32,231**
Notes: kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.					

8.3 Measure BE-4 & BE-5 Parameters, Data Sources, and Calculations

Two-way Air Conditioning Reach Code Equations

Equation 3 $CO_2e\ Reduction_{NG,y,i}=(Fuel\ Avoided_{NG,y,i}*EF_{NG})+(Fuel\ Avoided_{NGL,y,i}*EF_{NGL})-(Elec\ Converted_{y,i}*EF_{elec,y,i})$

Equation 3.1 $Fuel\ Avoided_{NG,y,i}=Fuel_{NG,y,i}*Reduction_{NG,y,i}$

Equation 3.2 $Fuel\ Avoided_{NGL,y,i}=Fuel\ Avoided_{NG,y,i}/(1-L_{NGL,end\text{-}use)}*(L_{NGL,end\text{-}use}+L_{NGL,pipeline})$

Equation 3.3 $Reduction_{NG,y,i}=(EOL_{NG,HVAC,y,i}*Fuel\ Share_{NG,HVAC,i})$

Equation 3.4 $EOL_{NG,HVAC,y,i}=1/LSP_{HVAC,i}*(y\text{-}imp.y_i)*(1\text{-}NCR_i)*CAC\ Share_{NG,i}$

Equation 3.5 $Elec_{convert,y,i} = Fuel\ _{AvoidedNG,y,i}*CF_{elec}/Eff_{elec}*(1+L_{T\&D})$

Table 16 Two-way Air Conditioning Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 3				
CO2e Reduction$_{NG}$	Natural gas GHG emission reductions	See Table 17	MT CO_2e	Calculated
Fuel Avoided$_{NG}$	Natural gas consumption avoided	See Table 17	therms	Calculated
EF$_{NG}$	Natural gas emission factor	0.005311	MT CO_2e/therm	EPA's Emission Factor Hub,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Fuel Avoided$_{NGL,y,i}$	Natural gas leakage avoided	See Table 17	therms	Calculated

Variable	Definition	Value	Unit	Data Source
EF_{NGL}	Natural gas leakage emission factor	0.047381	MT CO_2e/therm	2.85 m^3/therm * 95% methane content * 0.7 kg/m^3 * 25 * 0.001 MT/kg, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Elec Converted	Electricity usage from conversion	See Table 17	kWh	Calculated
$EF_{elec,y,i}$	Forecasted electricity emission factor	See Table 17	MT CO_2e/kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
y	Target year	2030 or 2045	year	City identified
i	Subsector	Residential or Nonresidential	—	—
Equation 3.1				
$Fuel_{NG,y,i}$	Forecasted natural gas consumption	See Table 17	therms	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Reduction_{NG,y,i}$	Natural gas reduction percent	See Table 17	percentage	Calculated
Equation 3.2				
$L_{NGL,end\text{-}use}$	Natural gas end-use leakage percentage	0.50%	percentage	Environmental Defense Fund,[2] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$L_{NGL,pipeline}$	Natural gas pipeline leakage percentage	2.30%	percentage	Alvarez, Ramón et al.,[3] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 3.3				
$EOL_{NG,HVAC,y,i}$	Percent of HVAC units reaching end-of-life	See Table 17	percentage	Calculated
$Fuel\ Share_{NG,HVAC,i}$	Natural gas usage from space heating/cooling	See below	percentage	—
$Fuel\ Share_{NG,HVAC,residential}$	Natural gas usage from residential space heating/cooling	39.1%	percentage	Synapse[4]
$Fuel\ Share_{NG,HVAC,nonresidential}$	Natural gas usage from nonresidential space heating/cooling	41.7%	percentage	Synapse[4]

Variable	Definition	Value	Unit	Data Source
Equation 3.4				
$LSP_{HVAC,i}$	Average HVAC unit lifespan	See below	years	—
$LSP_{HVAC,Residential}$	Average residential HVAC unit lifespan	22	years	Energy Information Administration (EIA)[5]
$LSP_{HVAC,Nonresidential}$	Average nonresidential HVAC unit lifespan	23	years	EIA[5]
$imp.y_i$	Ordinance implementation year	See below	year	City identified
$imp.y_{Residential}$	Ordinance implementation year for residential buildings	2026	year	Action BE-4b's implementation target
$imp.y_{Nonresidential}$	Ordinance implementation year for nonresidential buildings	2026	year	Action BE-5b's implementation target
NCR	Ordinance noncompliance rate	12%	percentage	Conservative assumption based on typical HVAC permit rates and expected outcomes from robust compliance programs with outreach, funding, enforcement, and streamlined permitting.[6,7,8]
$CAC\ Share_{NG,i}$	Share of buildings with central air conditioning units	See below	percentage	—
$CAC\ Share_{NG,Residential}$	Share of residential buildings with central air conditioning units and gas heating	59%	percentage	American Housing Survey: 2023 Riverside-San Bernardino[9]
$CAC\ Share_{NG,Nonresidential}$	Share of nonresidential buildings with package air conditioning units and gas heating	59%	percentage	Conservatively assumed to be same as residential buildings. American Housing Survey: 2023 Riverside-San Bernardino[9]
Equation 3.5				
CF_{elec}	Electricity to therms conversion factor	29.3	kWh/therm	Metric Conversions[10]
Eff_{elec}	Efficiency factor of electric equipment relative to natural gas equipment	3	unitless	European Copper Institute[11]
$L_{T\&D}$	Electricity transmission and distribution loss percentage	5.1%	percentage	EPA's eGRID Data Explorer,[12] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Variable	Definition	Value	Unit	Data Source

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; HVAC = heating, ventilation, and air conditioning; m^3 = cubic meter; kg = kilogram; MT = metric ton.

[1] U.S. Environmental Protection Agency (EPA). GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

[2] Environmental Defense Fund (EDF). USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Accessed at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[3] Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. https://www.science.org/doi/abs/10.1126/science.aar7204.

[4] Synapse Energy Economics, Inc. 2018. Decarbonization of Heating Energy Use in California Buildings, Figure 2. Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

[5] U.S. Energy Information Administration (EIA). 2023. Updated Buildings Sector Appliance and Equipment Costs and Efficiencies. Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[6] Meres, Ryan et al. American Council for an Energy-Efficient Economy (ACEEE). Successful Strategies for Improving Compliance with Building Energy Codes (2012). Accessed at: https://www.aceee.org/files/proceedings/2012/data/papers/0193-000112.pdf

[7] California Public Utilities Commission (CPUC). Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report (2017). Accessed at: http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

[8] Institute for Market Transformation. "$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes." Accessed at: https://www.energy.gov/gc/articles/microsoft-word-energy-code-enforcement-funding-task-force-fact-sheet-finaldocx#:~:text=Strong%20building%20energy%20codes%20are,codes%20the%20most%20severely%20underfunded

[9] U.S. Census Bureau. American Housing Survey: 2023 Riverside-San Bernardino-Ontario MSA. Accessed at: https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=40140&s_year=2023&s_tablename=TABLE3&s_bygroup1=1&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1

[10] Metric Conversions. Therms (US) to Kilowatt-hours.

[11] European Copper Institute. Heat Pumps: Integrating technologies to decarbonise heating and cooling (2018). Accessed at: https://www.ehpa.org/wp-content/uploads/2022/10/White_Paper_Heat_pumps-1.pdf

[12] EPA. Data Explorer, grid gross loss rates, 2019. Accessed at: https://www.epa.gov/egrid/data-explorer

Table 17 Two-way Air Conditioning GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045
Equation 3.1					
$Fuel_{NG,y,i}$	Forecasted natural gas consumption after new building electrification	therms	Residential	28,891,317	28,891,317
			Nonresidential	7,738,178	7,738,178
$Fuel\ Avoided_{NG,y,i}$	Natural gas consumption avoided	therms	Residential	1,097,642	5,213,799
			Nonresidential	293,138	1,392,403
Equation 3.2					
$Fuel\ Avoided_{NGL,y,i}$	Natural gas leakage avoided	therms	Residential	30,888	146,720
			Nonresidential	8,249	39,183
Equation 3.3					
$Reduction_{NG,y,i}$	Natural gas reduction percent	percentage	Residential	3.8%	18.0%
			Nonresidential	3.8%	18.0%
Equation 3.4					
$EOL_{NG,HVAC}$	Percent of HVAC units reaching end-of-life	percentage	Residential	10%	46%
			Nonresidential	9%	43%
Equation 3.5					
$Elec\ Converted_{y,i}$		kWh	Residential	11,267,038	53,518,430

Variable	Definition	Units	Sector	2030	2045
	Electricity usage from conversion		Nonresidential	3,008,988	14,292,694
Equation 3					
$EF_{elec,y,i}$	Forecasted electricity emission factor	MT CO_2e/kWh	Residential	0.000152	0.000000
			Nonresidential	0.000160	0.000000
CO_2e $Reduction_{NG,y,i}$	**Natural gas GHG emissions reduction**	**MT CO_2e**	**Residential**	**5,585**	**34,645**
			Nonresidential	**1,466**	**9,252**

Notes: kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; HVAC = heating, ventilation, and air conditioning.

All-electric Significant Residential Remodels Equations

Equation 4 $CO_2e\ Reduction_{NG,y}=(Fuel\ Avoided_{NG,y}*EF_{NG})+(\ Fuel\ Avoided_{NGL,y}*EF_{NGL})-(Elec\ Converted_y*EF_{elec,y})$

Equation 4.1 $Fuel\ Avoided_{NG,y}=Fuel_{NG,y}-Fuel_{NG,y}*(1-MR*(1-NCR))^{(y-imp.y)}$

Equation 4.2 $Fuel\ Avoided_{NGL,y} = Fuel\ Avoided_{NG,y}/(1-L_{NGL,end-use)}*(L_{NGL,end-use}+L_{NGL,pipeline})$

Equation 4.3 $Elec_{convert,y} = Fuel\ _{AvoidedNG,y}*(CF_{elec}/Eff_{elec})*(1+L_{T\&D})$

Table 18 All-electric Significant Residential Remodels Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 4				
$CO_2e\ Reduction_{NG,y}$	Natural gas GHG emissions reduction	See Table 19	MT CO_2e	Calculated
$Fuel\ Avoided_{NG,y}$	Natural gas consumption avoided	See Table 19	therms	Calculated
EF_{NG}	Natural gas emission factor	0.00531	MT CO_2e/therm	EPA's Emission Factor Hub,[1] consistent with GHG Forecast (Appendix C)
EF_{NGL}	Natural gas leakage emission factor	0.04738	MT CO_2e/therm	2.85 m^3/therm * 95% methane content * 0.7 kg/m^3 * 25 * 0.001 MT/kg, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Elec\ Converted_y$	Electricity usage from conversion	See Table 19	kWh	Calculated
$EF_{elec,y}$	Forecasted electricity emission factor	See Table 19	MT CO_2e/kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
y	Target year	2030 or 2045	year	City identified
Equation 4.1				

Variable	Definition	Value	Unit	Data Source
$Fuel_{NG,y}$	Forecasted natural gas consumption after new building electrification ordinance (Measures BE-2 and BE-3)	See Table 19	therms	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$MR_{residential}$	Annual percentage of residential buildings receiving major renovations	1%	percentage	Estimated based on Moreno Valley house stock age (Table 5) and average lifespan of a house.[2]
NCR	Ordinance noncompliance rate	12%	percentage	Conservative assumption based on typical HVAC permit rates and expected outcomes from robust compliance programs with outreach, funding, enforcement, and streamlined permitting.[3,4,5]
$imp.y_{residential}$	Ordinance implementation year	2026	year	City identified; Action BE-2b implementation target
Equation 4.2				
$L_{NGL,end\text{-}use}$	Natural gas end-use leakage percentage	0.50%	percentage	Environmental Defense Fund,[6] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$L_{NGL,pipeline}$	Natural gas pipeline leakage percentage	2.30%	percentage	Alvarez, Ramón et al.,[7] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 4.3				
CF_{elec}	Electricity to therms conversion factor	29.3	kWh/therm	Metric Conversions[8]
Eff_{elec}	Efficiency factor of electric equipment relative to natural gas equipment	3	unitless	European Copper Institute[9]
$L_{T\&D}$	Electricity transmission and distribution loss percentage	5.10%	percentage	EPA's eGRID Data Explorer,[10] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Variable	Definition	Value	Unit	Data Source

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; HVAC = heating, ventilation, and air conditioning; m^3 = cubic meter; kg = kilogram; MT = metric ton.

[1] U.S. Environmental Protection Agency (EPA). GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

[2] MIT Architecture. Architectural Longevity: What Determines a Building's Lifespan? (2023). https://architecture.mit.edu/news/architectural-longevity-what-determines-buildings-lifespan#:~:text=Courtesy%20of%20the%20artists.&text=The%20average%20lifespan%20of%20a,years%2C%20from%20construction%20to%20demolition

[3] Meres, Ryan et al. American Council for an Energy-Efficient Economy (ACEEE). Successful Strategies for Improving Compliance with Building Energy Codes (2012). Accessed at: https://www.aceee.org/files/proceedings/2012/data/papers/0193-000112.pdf

[4] California Public Utilities Commission (CPUC). Final Report: 2014-16 HVAC Permit and Code Compliance Market Assessment (Work Order 6) Volume I – Report (2017). Accessed at: http://www.calmac.org/publications/HVAC_WO6_FINAL_REPORT_VolumeI_22Sept2017.pdf

[5] Institute for Market Transformation. "$810 Million Funding Needed to Achieve 90% Compliance with Building Energy Codes." Accessed at: https://www.energy.gov/gc/articles/microsoft-word-energy-code-enforcement-funding-task-force-fact-sheet-finaldocx#:~:text=Strong%20building%20energy%20codes%20are,codes%20the%20most%20severely%20underfunded

[6] Environmental Defense Fund (EDF). USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Accessed at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[7] Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. https://www.science.org/doi/abs/10.1126/science.aar7204.

[8] Metric Conversions. Therms (US) to Kilowatt-hours.

[9] European Copper Institute. Heat Pumps: Integrating technologies to decarbonise heating and cooling (2018). Accessed at: https://www.ehpa.org/wp-content/uploads/2022/10/White_Paper_Heat_pumps-1.pdf

[10] EPA. Data Explorer, grid gross loss rates, 2019. Accessed at: https://www.epa.gov/egrid/data-explorer

Table 19 All-electric Significant Residential Remodels GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045
Equation 4.1					
$Fuel_{NG}$	Forecasted natural gas consumption after new building electrification and two-way AC reach code	therms	Residential	27,793,675	23,677,518
$Fuel\ Avoided_{NG}$	Natural gas consumption avoided	therms	Residential	965,499	3,660,437
Equation 4.2					
$Fuel\ Avoided_{NGL}$	Natural gas leakage avoided	therms	Residential	27,170	103,007
Equation 4.3					
Elec Converted	Electricity usage from conversion	kWh	Residential	9,910,621	37,573,530
Equation 4					
EF_{elec}	Forecasted electricity emission factor	MT CO_2e/kWh	Residential	0.0001516	0.0000000
$CO_2e\ Reduction_{NG}$	**Natural gas GHG emissions reduction**	**MT CO_2e**	**Residential**	**4,913**	**24,323**

Notes: kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.

Electric Water Heater Replacements Equations

Equation 5 $CO_2e\ Reduction_{NG,y,i}=\Sigma((Fuel\ Avoided_{y,i}*EF_{NG})+(Fuel\ Avoided_{NGL,y,i}*EF_{NGL}))-(Elec\ Converted_{y,i}*EF_{elec,y,i}*(1+L_{T\&D}))$

Equation 5.1 $Elec\ Convert_{y,i} = \Sigma\ (Fuel\ Avoided_{y,i}*CF_{elec}/Eff_{elec,wh})$

Equation 5.2 $Fuel\ Avoided_{NGL,y,i}=Fuel\ Avoided_{NG,y,i}/(1-L_{NGL,end\text{-}use)}*(L_{NGL,end\text{-}use}+L_{NGL,pipeline})$

Equation 5.3 $Fuel\ Avoided_{y,i}=(Fuel_{y,i}-Fuel_{reduced,y,i})*(EOL_{NG,wh,y,i}*Fuel\ Share_{wh,i}*MS_{elec,wh,y})$

Equation 5.4 $EOL_{NG,y,i}=1/LSP_{i,wh}*(y\text{-}imp.y_i)$

Equation 5.5 $Eff_{elec,wh} = \Sigma\ Eff_{elec,wh} * Prop_{elec,eh,ER}$

Table 20 Electric Water Heater Replacements Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 5				
$CO2e\ Reduction_{NG,y,i}$	Natural gas GHG emission reductions	See Table 21	MT CO_2e	Calculated
$Fuel\ Avoided_{NG,y,i}$	Natural gas consumption avoided	See Table 21	therms	Calculated
EF_{NG}	Natural gas emission factor	0.005311	MT CO_2e/therm	EPA's Emission Factor Hub,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Fuel\ Avoided_{NGL,y,i}$	Natural gas leakage avoided	See Table 21	therms	Calculated
EF_{NGL}	Natural gas leakage emission factor	0.047381	MT CO_2e/therm	2.85 m^3/therm * 95% methane content * 0.7 kg/m^3 * 25 * 0.001 MT/kg, consistent with GHG Inventory and GHG Forecast (Appendix B: 2019 Community Greenhouse Gas Emissions Inventory; Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Elec\ Converted_{y,i}$	Electricity usage from conversion	See Table 21	kWh	Calculated
$Ef_{elec,y,i}$	Forecasted electricity emission factor	See Table 21	MT CO_2e/kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$L_{T\&D}$	Electricity transmission and distribution loss percentage	5.10%	percentage	EPA's eGRID Data Explorer,[2] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
y	Target year	2030 or 2045	year	City identified
i	Subsector	Residential or Nonresidential	—	—
Equation 5.1				

Variable	Definition	Value	Unit	Data Source
CF_{elec}	Electricity to therms conversion factor	29.3	kWh/therm	Metric Conversions[3]
Equation 5.2				
$L_{NGL,end\text{-}use}$	Natural gas end-use leakage percentage	0.50%	percentage	Environmental Defense Fund,[4] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$L_{NGL,pipeline}$	Natural gas pipeline leakage percentage	2.30%	percentage	Alvarez, Ramón et al.,[5] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 5.3				
$Fuel_{y,i}$	Forecasted natural gas consumption after new building electrification	See Table 21	therms	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Fuel_{reduced,y,i}$	Natural gas reductions from ordinances	See Table 21	therms	Calculated
$EOL_{NG,wh,y,i}$	Percent of water heaters reaching end of life	See Table 21	percentage	Synapse[6]
$Fuel\ Share_{wh,i}$	Percent of sector natural gas consumption from water heaters	See below	percentage	—
$Fuel\ Share_{wh,res}$	Percent of residential natural gas consumption from water heaters	38%	percentage	Synapse[6]
$Fuel\ Share_{wh,nonres}$	Percent of nonresidential natural gas consumption from water heaters	28%	percentage	Synapse[6]
$MS_{elec,wh,y}$	Market share of water heaters	See below	percentage	—
$MS_{elec,wh,2030}$	Market share of water heaters 2030	12%	percentage	Opinion Dynamics[7]
$MS_{elec,wh,2045}$	Market share of water heaters 2045	100%	percentage	Assume domination of market by 2045[8]
Equation 5.4				
$LSP_{i,wh}$	Average water heater unit lifespan	See below	years	—
$LSP_{residential,wh}$	Average residential water heater unit lifespan	22	years	EIA[9]

Variable	Definition	Value	Unit	Data Source
$LSP_{nonresidential,wh}$	Average nonresidential water heater unit lifespan	23	years	EIA[9]
$imp.y_i$	Implementation year	See below	year	City identified
$imp.y_{residential}$	Implementation year for residential buildings	2026	year	CAP implementation year
$imp.y_{nonresidential}$	Implementation year for nonresidential buildings	2026	year	CAP implementation year
Equation 5.5				
$Eff_{elec,wh}$	Efficiency factor of water heaters relative to natural gas equipment	1	unitless	Conservative estimate of 1:1 efficiency between electric and gas water heaters[10,11]
$Prop_{elec,wh,ER}$	Electric resistance proportion of water heater technology	100%	percentage	As high efficiency technology (i.e. solar and heat pumps) is 1% of the market, assumed all water heaters are electric resistance as a conservative estimation.[7]

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; m^3 = cubic meter; kg = kilogram; MT = metric ton.

[1] U.S. Environmental Protection Agency (EPA). GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

[2] EPA. Data Explorer, grid gross loss rates, 2019. Accessed at: https://www.epa.gov/egrid/data-explorer

[3] Metric Conversions. Therms (US) to Kilowatt-hours.

[4] Environmental Defense Fund (EDF). USER GUIDE FOR NATURAL GAS LEAKAGE RATE MODELING TOOL. Accessed at: https://www.edf.org/sites/default/files/US-Natural-Gas-Leakage-Model-User-Guide.pdf

[5] Alvarez, Ramón et al. (2018). Assessment of methane emissions from the U.S. oil and gas supply chain. Science. 361. https://www.science.org/doi/abs/10.1126/science.aar7204.

[6] Synapse Energy Economics, Inc. 2018. Decarbonization of Heating Energy Use in California Buildings, Figure 2. Accessed at: https://www.synapse-energy.com/sites/default/files/Decarbonization-Heating-CA-Buildings-17-092-1.pdf

[7] Opinion Dynamics. 2022. California Heat Pump Residential Market Characterization and Baseline Study. Accessed at: https://pda.energydataweb.com/api/view/2625/OD-CPUC-Heat-Pump-Market-Study-Report_Final.pdf

[8] Given the State's robust efforts, policies, and guidelines supporting electrification, it is assumed that electric water heaters and space heating units will achieve full market share dominance by 2045, aligning with broader Statewide decarbonization goals.

[9] U.A. Energy Information Administration (EIA). 2023. Updated Buildings Sector Appliance and Equipment Costs and Efficiencies. Accessed at: https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf

[10] Schnackel Engineers. 2023. Electric Heating vs Gas Heating. Accessed at: https://schnackel.com/blogs/electric-heating-vs-gas-heating#:~:text=One%20of%20the%20significant%20advantages,losses%20during%20the%20combustion%20process

[11] Southface Energy Institute. Water Heater Efficiency, Efficiency of Fuel Types and Alternatives for Heating Water. Accessed at: https://www.ncelec.org/sites/ncelec/files/documents/waterheater_efficiency_041614.pdf

Table 21 Electric Water Heater Replacements GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045
Equation 5.5					
$Eff_{elec,wh}$	Efficiency factor of water heaters relative to natural gas	unitless	Residential	1.00	1.00
			Nonresidential	1.00	1.00

Variable	Definition	Units	Sector	2030	2045
Equation 5.4					
$EOL_{NG,y,i,wh}$	Percent of water heaters reaching end-of-life since ordinance implementation	percentage	Residential	31%	100%
			Nonresidential	40%	100%
Equation 5.3					
$Fuel_{y,i}$	Forecasted natural gas consumption after new building electrification	therms	Residential	29,093,243	29,850,468
			Nonresidential	7,791,923	7,993,468
$Fuel\ Avoided_{wh,y,i}$	Natural gas consumption avoided	therms	Residential	408,201	11,343,178
			Nonresidential	104,723	2,238,171
Equation 5.2					
$Fuel\ Avoided_{NGL}$	Natural gas leakage avoided	therms	Residential	11,487	319,205
			Nonresidential	2,947	62,984
Equation 5.1					
$Elec\ Converted_{wh,i}$	Electricity usage from conversion of water heater systems	kWh	Residential	11,960,277	332,355,113
			Nonresidential	3,068,397	65,578,408
Equation 5					
$EF_{elec,y,i}$	Forecasted electricity emission factor	MT CO_2e/kWh	Residential	0.0001516	0.0000000
			Nonresidential	0.0001603	0.0000000
$\boldsymbol{CO_2e\ Reduction_{NG,y,i}}$	**Natural gas GHG emissions reduction**	**MT CO_2e**	**Residential**	**806**	**75,373**
			Nonresidential	**179**	**14,872**

Notes: kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.

8.4 Measure T-1 Parameters, Data Sources, and Calculations

Active Transportation Mode Share Equations

Equation 6 $CO_2e\ Reduction_{i,y} = VMT\ Reduced_{i,y} * VMT\ EF_{i,y}$

Equation 6.1 $VMT\ Reduced_{i,y} = ((VMT_{i,y} - VMT_{WFH,y}) * TPM_{i,y}) * TL_i * MS\ Increase_{Bike,y}$

Equation 6.2 $MS\ Increase_{Bike,y} = MS\ Target_{Active,y} - MS_{Bike,by}$

Table 22 Active Transportation Mode Share Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 6				
CO_2e Reduction	VMT GHG emissions reduction	See Table 23	MT CO_2e	Calculated
VMT Reduced	VMT reduced	See Table 23	miles	Calculated
VMT EF	VMT emission factor	See Table 23	MT CO_2e/mile	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Variable	Definition	Value	Unit	Data Source
y	Target year	2030 or 2045	year	City identified
Equation 6.1				
$VMT_{i,y}$	Forecasted VMT	See Table 23	miles	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$VMT_{WFH,y}$	Forecasted VMT reductions from work-from-home measure (Measure T-3)	See Table 23	miles	Calculated, see Table 27
$TPM_{i,y}$	Forecasted trips per mile	See Table 23	trips/mile	Moreno Valley's 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
TL_i	Average bicycle trip length	1.5	miles	CARB Quantifying Reductions in Vehicle Miles Traveled from New Bike Paths, Lanes, and Cycle Tracks: Technical Documentation[2]
$MS\ Increase_{Bike,y}$	Bicycle mode share increase	See Table 23	percentage	Calculated
i	VMT type	Passenger	—	—
Equation 6.2				
$MS\ Target_{Active,y}$	Active transportation mode share target by year	See below	percentage	City identified
	Active transportation mode share target for 2030	3%	percentage	Measure T-1's implementation target. Based on bicycle network quality/connectivity improvements proven in Algiers, New Orleans[3] and bicycle mode shares currently seen in Davis and Berkeley.[4,5]
	Active transportation mode share target for 2045	6%	percentage	Measure T-1's implementation target. Based on bicycle mode shares currently seen in Davis and Berkeley.[4,5]
$MS_{Bike,by}$	Bicycle mode share in baseline year	0.21%	percentage	US Census Bureau. 2019: ACS 5-Year Estimates Subject Tables.[6]
$MS_{Walk,by}$	Walking mode share in baseline year	0.82%	percentage	US Census Bureau. 2019: ACS 5-Year Estimates Subject Tables.[6] Assumed constant through 2045.
by	Baseline year	2019	year	City identified; Appendix B: 2019 Community Greenhouse Gas Emissions Inventory

Variable	Definition	Value	Unit	Data Source

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles traveled.

[1] California Air Resources Board (CARB). EMFAC2021 (v1.0.2) Emissions Inventory. Riverside County. Accessed at: https://arb.ca.gov/emfac/emissions-inventory/ca7ec086c924a9a54a7806297807d5c469a79f95

[2] CARB. Quantifying Reductions in Vehicle Miles Traveled from New Bike Paths, Lanes, and Cycle Tracks: Technical Documentation (2019). Accessed at: https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdf

[3] Pedestrian and Bicycle Information Center. Info Brief: Using Connectivity Measures to Evaluate and Build Connected Bicycle Networks. Accessed at: https://www.pedbikeinfo.org/cms/downloads/PBIC_Brief_MeasuringNetworks_FINAL.pdf

[4] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Davis (2022). Accessed at: https://data.census.gov/table/ACSST5Y2022.S0801?t=Commuting&g=160XX00US0618100

[5] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Berkeley (2022). Accessed at: https://data.census.gov/table/ACSST5Y2022.S0801?t=Commuting&g=160XX00US0606000

[6] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Moreno Valley (2019). Accessed at: https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270

Table 23 Active Transportation Mode Share GHG Emissions Reduction Calculations

Variable	Definition	Units	Sector	2030	2045
Equation 6.2					
$MS\ Increase_{Bike}$	Bicycle mode share increase	percentage	Passenger	1.97%	4.97%
Equation 6.1					
VMT	Forecasted VMT	miles	Passenger	1,993,178,131	2,650,236,084
$VMT_{WFH,y}$	Forecasted VMT reductions from Measure T-3	miles	Passenger	216,164,023	508,820,762
TPM	Forecasted trips per mile	trips/mile	Passenger	0.157451	0.153740
VMT Reduced	VMT reduced	miles	Passenger	8,277,295	24,554,583
Equation 6					
VMT EF	VMT emission factor	MT CO_2e/VMT	Passenger	0.000284	0.000248
CO_2e Reduction	**VMT GHG emissions reduction**	**MT CO_2e**	**Passenger**	**2,352**	**6,079**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled.

8.5 Measure T-2 Parameters, Data Sources, and Calculations

Public Transit Mode Share Equations

Equation 7 $CO_2e\ Reduction_{i,y} = VMT\ Reduced_{i,y} * VMT\ EF_{i,y}$

Equation 7.1 $VMT\ Reduced_{i,y} = ((VMT_{i,y} - VMT_{active,y} - VMT_{WFH,y}) * TPM_{i,y}) * TL_i * MS\ Increase_{public,y}$

Equation 7.2 $MS\ Increase_{public,y} = MS\ Target_{public,y} - MS_{public,by}$

Table 24 Public Transit Mode Share Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 7				
CO_2e *Reduction*	VMT GHG emissions reduction	See Table 25	MT CO_2e	Calculated

Variable	Definition	Value	Unit	Data Source
VMT Reduced	VMT reduced	See Table 25	miles	Calculated
VMT EF	VMT emission factor	See Table 25	MT CO_2e/mile	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
y	Target year	2030 or 2045	—	City identified
Equation 7.1				
VMT	Forecasted VMT	See Table 25	miles	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$VMT_{active,y}$	VMT reduction from active transportation targets (Measure T-1)	See Table 25	miles	Calculated from Table 23
$VMT_{WFH,y}$	VMT reduction from work-from-home measure (Measure T-3)	See Table 23	miles	Calculated, see Table 27
$TPM_{i,y}$	Forecasted trips per mile	See Table 25	trips/mile	Moreno Valley's 2024 General Plan Update
TL_i	Average public transit trip length	8.41	miles	Assumed average trip length of Riverside Transit Agency bus trips. US Department of Transportation.[2]
$MS\ Increase_{public,y}$	Public Transit mode share increase	See Table 25	percentage	Calculated
i	VMT type	Passenger	—	—
Equation 7.2				
$MS\ Target_{public,y}$	Public transit mode share target	See below	—	City identified
	Public transit mode share target for 2030	2.7%	percentage	Measure T-2's implementation target. Based on projected Riverside Transit Agency ridership recovery, outreach strategies, and mode shift potential for parking and microtransit programs.[3,4,5,6]
	Public transit mode share target for 2045	10%	percentage	Measure T-2's implementation target. Conservative goal based on public transit mode shares seen in Oakland, Berkeley and San Francisco.[7,8,9]
$MS_{public,by}$	Public transit mode share in baseline year	1.23%	percentage	US Census Bureau. 2019: ACS 5-Year Estimates Subject Tables[10]
by	Baseline year	2019	year	City identified; Appendix B: 2019 Community Greenhouse Gas Emissions Inventory

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled.

[1] California Air Resources Board (CARB). EMFAC2021 (v1.0.2) Emissions Inventory. Riverside County. Accessed at: https://arb.ca.gov/emfac/emissions-inventory/ca7ec086c924a9a54a7806297807d5c469a79f95

Variable	Definition	Value	Unit	Data Source

[2] US Department of Transportation. 2022 Agency Profile - Riverside Transit Agency. Accessed at: https://www.transit.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2022/90031.pdf

[3] Riverside Transit. Short Range Transit Plan FY25-FY27 (2024). Accessed at: https://www.riversidetransit.com/images/DOWNLOADS/PUBLICATIONS/SRTPS/FY2025-2027%20SRTP.pdf

[4] Nawshin Tabassum, Hannaneh Abdollahzadeh Kalantari, Justyna Kaniewska, et al. Case Studies on Transport Policy. Ways of increasing transit ridership-lessons learned from successful transit agencies (2025). Accessed at: https://www.sciencedirect.com/science/article/pii/S2213624X24002177

[5] CAPCOA. Handbook for Analyzing Greenhouse Gas Emission Reductions. Measure T-24 and T-15. Accessed at: https://www.caleemod.com/documents/handbook/full_handbook.pdf

[6] Via. How microtransit helps reduce emissions (2023). Accessed at: https://ridewithvia.com/resources/how-microtransit-helps-reduce-emissions

[7] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Oakland (2023). Accessed at: https://data.census.gov/table/ACSST5Y2023.S0801?t=Commuting&g=160XX00US0653000

[8] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Berkeley (2023). Accessed at: https://data.census.gov/table/ACSST5Y2023.S0801?t=Commuting&g=160XX00US0606000

[9] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, San Francisco (2023). Accessed at: https://data.census.gov/table/ACSST5Y2023.S0801?t=Commuting&g=160XX00US0667000

[10] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Moreno Valley (2019). Accessed at: https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270

Table 25 Public Transit Mode Share GHG Emissions Reduction Calculations

Variable	Definition	Units	VMT Type	2030	2045
Equation 7.2					
$MS\ Increase_{public}$	Public Transit mode share increase	percentage	Passenger	1.47%	8.77%
Equation 7.1					
VMT	Forecasted VMT	miles	Passenger	1,993,178,131	2,650,236,084
$VMT_{active,y}$	VMT reduction from active transportation targets (Measure T-1)	miles	Passenger	8,277,295	24,554,583
$VMT_{WFH,y}$	VMT reduction from work-from-home measure (Measure T-3)	miles	Passenger	216,164,023	508,820,762
TPM	Forecasted trips per mile	trips/mile	Passenger	0.157451	0.153740
VMT Reduced	VMT reduced	miles	Passenger	34,371,108	240,082,463
Equation 7					
VMT EF	VMT emission factor	MT CO_2e/mile	Passenger	0.000284	0.000248
CO_2e Reduction	**VMT GHG emissions reduction**	**MT CO_2e**	**Passenger**	**9,767**	**59,435**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled.

8.6 Measure T-3 Parameters, Data Sources, and Calculations

Work from Home Mode Share Equations

Equation 8 $CO_2e\ Reduction_{i,y} = VMT\ Reduced_{i,y} * VMT\ EF_{i,y}$

Equation 8.1 $VMT\ Reduced_{i,y} = (VMT_{i,y} * VMT\ Share_{work} * TPM_{i,y}) * TL * MS\ Increase_{WFH,y}$

Equation 8.2 $MS\ Increase_{WFH,y} = MS\ Target_{WFH,y} - MS_{WFH,by}$

Table 26 Work from Home Mode Share Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 8				
$CO_2e\ Reduction_{i,y}$	VMT GHG emissions reduction	See Table 27	MT CO_2e	Calculated
$VMT\ Reduced_{i,y}$	VMT reduced	See Table 27	miles	Calculated
$VMT\ EF_{i,y}$	VMT emission factor	See Table 27	MT CO_2e/mile	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 8.1				
$VMT_{i,y}$	Forecasted VMT	See Table 27	miles	Moreno Valley's 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$VMT\ Share_{work}$	Share of VMT for work trips	28%	miles	US Department of Transportation[2]
$TPM_{i,y}$	Forecasted trips per mile	See Table 27	trips/mile	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
TL	Forecasted miles per trip	20	miles/trip	Conservative average work commute roundtrip distance of Moreno Valley residents from Replica analysis[3]
$MS\ Increase_{WFH,y}$	Work from home mode share increase	See Table 27	percentage	Calculated
i	VMT type	Passenger	—	—
y	Target year	2030 or 2045	year	City identified
Equation 8.2				
$MS\ Target_{WFH,y}$	Work-from-home mode share target	See below	—	City identified
	Work-from-home mode share target for 2030	15%	percentage	Measure T-3's implementation target. Based on observed 1% annual growth in Moreno Valley's remote work rate since 2019, supported by broadband expansion, TDM strategies, and employer incentives.[4,5,6]
	Work-from-home mode share target for 2045	25%	percentage	Measure T-3's implementation target. Based on observed 1% annual growth in Moreno Valley's remote work rate since 2019, supported by broadband expansion, TDM strategies, and employer incentives.[4,5,6]

Variable	Definition	Value	Unit	Data Source
$MS_{WFH,by}$	Work-from-home mode share in baseline year	2.70%	percentage	US Census Bureau. 2019: ACS 5-Year Estimates Subject Tables[4]
by	Baseline year	2019	year	City identified; Appendix B: 2019 Community Greenhouse Gas Emissions Inventory

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled.

[1] California Air Resources Board (CARB). EMFAC2021 (v1.0.2) Emissions Inventory. Riverside County. Accessed at: https://arb.ca.gov/emfac/emissions-inventory/ca7ec086c924a9a54a7806297807d5c469a79f95

[2] U.S. Department of Transportation. Commuting in A Post-Baby Boomer World (2016). Accessed at: https://highways.dot.gov/public-roads/januaryfebruary-2016/commuting-post-baby-boomer-world

[3] Replica. Accessed at: https://www.replicahq.com/

[4] US Census Bureau. ACS 5-Year Estimates Subject Tables. S0801|Commuting Characteristics by Sex, Moreno Valley (2019). Accessed at: https://data.census.gov/table/ACSST5Y2019.S0801?t=Employment&g=160XX00US0649270

[5] Deloitte. Broadband for All: Charting a Path to Economic Growth (2021). Accessed at: https://s3.amazonaws.com/connected-nation/de62e41e-f8c2-4eb6-aca5-32c1bcf07802/us-charting-a-path-to-economic-growth.pdf

[6] California Air Pollution Control Officers Association (CAPCOA). Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (2021). Measure T-6. Accessed at: https://www.caleemod.com/documents/handbook/full_handbook.pdf

Table 27 Work from Home Mode Share GHG Emissions Reduction Calculations

Variable	Definition	Units	VMT Type	2030	2045
Equation 8.2					
$MS\ Increase_{wfh}$	Work from home mode share increase	percentage	Passenger	12.30%	22.30%
Equation 8.1					
VMT	Forecasted VMT	miles	Passenger	1,993,178,131	2,650,236,084
TPM	Forecasted trips per mile	trips/mile	Passenger	0.157451	0.153740
VMT Reduced	VMT reduced	miles	Passenger	216,164,023	508,820,762
Equation 8					
VMT EF	VMT emission factor	MT CO_2e/mile	Passenger	0.000284	0.000248
CO_2e Reduction	**VMT GHG emissions reduction**	**MT CO_2e**	**Passenger**	**61,426**	**125,963**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled.

8.7 Measure T-4 Parameters, Data Sources, and Calculations

Publicly Accessible Electric Vehicle Chargers Equations

Equation 9 $PEV\ Chargers_y = Region\ PEV\ Chargers_y * (EVs_y/(Region\ EVs_y)) - Existing\ PEV\ Chargers_{by}$

Equation 9.1 $EVs_y = Population_y * (Vehicles_{by}/Population_{by}) * EV\ Target_{Pass,y}$

Equation 9.2 $Region\ EVs_y = Region\ Vehicles_y * EV\ Target_{Pass,y}$

Table 28 Publicly Accessible Electric Vehicle Charger Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 9				
PEV Chargers$_y$	New publicly accessible electric vehicle chargers needed	See Table 29	chargers	Calculated
Region PEV Chargers$_y$	Regional electric vehicle chargers needed	See below	chargers	—
	Regional electric vehicle chargers needed in 2030	54,495	chargers	Electric Vehicle Infrastructure Projection Tool for Riverside-San Bernardino-Ontario[1]
	Regional electric vehicle chargers needed in 2045	330,503	chargers	Electric Vehicle Infrastructure Projection Tool for Riverside-San Bernardino-Ontario[1]
EVs$_y$	Electric vehicles targeted	See Table 29	electric vehicles	Calculated
Region EVs$_y$	Regional electric vehicles targeted	See Table 29	electric vehicles	Calculated
Existing PEV Chargers$_{by}$	Existing publicly accessible electric vehicle chargers	101	chargers	PlugShare[2]
y	Target year	2030 or 2045	year	City identified
by	Baseline year	2019	year	City identified; Appendix B: 2019 Community Greenhouse Gas Emissions Inventory
Equation 9.1				
Population$_y$	Forecasted population	See Table 29	people	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Vehicles$_{by}$	Vehicles in baseline year	144,664	vehicles	California Department of Motor Vehicles[3]
Population$_{by}$	Population in baseline year	176,614	people	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
EV Target$_{Pass,y}$	Passenger electric vehicle adoption target	See below	percentage	City identified
	Electric vehicle adoption target (2030)	31%	percentage	Measure T-4's implementation target enabled by publicly accessible electric vehicle chargers and the State's 2030 charger goal.[4,5]

Variable	Definition	Value	Unit	Data Source
	Electric vehicle adoption target (2045)	100%	percentage	Measure T-4's implementation target enabled by publicly accessible electric vehicle chargers.[4]
Equation 9.2				
Regional Vehicles	Regional vehicles	4,093,200	vehicles	Electric Vehicle Infrastructure Projection Tool for Riverside-San Bernardino-Ontario[1]

Notes: "—" means either reference not applicable or see references for disaggregated parameter in the following table rows. EV = electric vehicle; PEV = plug-in electric vehicle.

[1] U.S. Department of Energy. Electric Vehicle Infrastructure Projection Tool (EVI-Pro) Lite. Accessed at: https://afdc.energy.gov/evi-pro-lite

[2] PlugShare. EV Charging in Moreno Valley, CA. Accessed at: https://www.plugshare.com/directory/us/california/moreno-valley

[3] California Department of Motor Vehicles. Fuel Type by County as of 1/1/2020. Accessed at: https://www.dmv.ca.gov/portal/uploads/2020/09/MotorVehicleFuelTypes_City_01012020.pdf

[4] Kampshoff, Philipp et al. Building the Electric-Vehicle Charging Infrastructure America Needs (2022). Accessed at: https://www.mckinsey.com/industries/public-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs

[5] California Energy Commission (CEC). Assembly Bill 2127 Second Electric Vehicle Charging Infrastructure Assessment: Assessing Charging Needs to Support Zero-Emission Vehicles in 2030 and 2035 (2024). Accessed at: https://www.energy.ca.gov/publications/2024/assembly-bill-2127-second-electric-vehicle-charging-infrastructure-assessment#:~:text=The%20analysis%20presented%20in%20this,support%20jobs%20of%20the%20future

Table 29 Publicly Accessible Electric Vehicle Charger Calculations

Variable	Definition	Units	2030	2045
Equation 9.2				
Region EVs	Regional electric vehicles targeted	electric vehicles	1,268,892	4,093,200
Equation 9.1				
Population	Forecasted population in Moreno Valley	people	97,342	113,058
EVs	Electric vehicles targeted in Moreno Valley	electric vehicles	24,717	92,606
Equation 9				
PEV Chargers	**New publicly accessible electric vehicle chargers needed in Moreno Valley**	**chargers**	**961**	**7,376**

Notes: EV = electric vehicle; PEV = plug-in electric vehicle.

ZEV Adoption Equations

Equation 10 $CO_2e\ Reduction_{VMT,i,y}=(VMT\ Reduced_{ICE,i,y}*EF_{VMT,i,y})-(Elec\ Converted_{i,y}*EF_{elec,i,y})$

Equation 10.1 $Elec\ Converted_{i,y}=VMT\ Reduced_{ICE,i,y}*EPM_{ZEV,i,y}*(1+L_{T\&D})$

Equation 10.2 $VMT\ Reduced_{ICE,i,y}=(VMT_{i,y})*(ZEV\ Adoption_{i,y}-ZEV\ Adoption\ Baseline_{i,y})$

Table 30 ZEV Adoption Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 10				

Variable	Definition	Value	Unit	Data Source
$CO_2e\ Reduction_{VMT,i,y}$	VMT GHG emissions reduction	See Table 31	MT CO_2e	Calculated
$VMT\ Reduced_{ICE,y,i}$	Internal combustion engine VMT reduced	See Table 31	miles	Calculated
$EF_{VMT,i,y}$	Forecasted VMT emission factor	See Table 31	MT CO_2e/mile	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Elec\ Converted_{i,y}$	Electricity from zero-emission vehicle conversion	See Table 31	kWh	Calculated
$EF_{elec,i,y}$	Forecasted residential electricity emission factor	See Table 31	MT CO_2e/kWh	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$L_{T\&D}$	Electricity transmission and distribution loss percentage	5.10%	percentage	EPA's eGRID Data Explorer,[2] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
i	VMT type	Passenger or Commercial	—	—
y	Target year	2030 or 2045	year	City identified
Equation 10.1				
$EPM_{ZEV,i,y}$	Forecasted electricity usage per mile of electric vehicles	See Table 31	kWh/mile	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
Equation 10.2				
$VMT_{i,y}$	Forecasted VMT after Measure T-1, T-2 and T-3 reductions	See Table 31	miles	Table 23, Table 25 and Table 27
$ZEV\ Adoption_{i,y}$	Zero-emission vehicle adoption target	See below	percentage	City identified
	Zero-emission vehicle passenger adoption target for 2030	31%	percentage	Measure T-4's implementation target supported by 961 publicly accessible electric vehicle chargers.[3] Conservative goal compared to current level of existing charging in San Jose, San Francisco, San Diego, Irvine and Los Angeles.[4]
	Zero-emission vehicle passenger adoption target for 2045	100%	percentage	Measure T-4's implementation target supported by 7,376 publicly accessible electric vehicle chargers.[3]

Variable	Definition	Value	Unit	Data Source
	Zero-emission vehicle commercial adoption target for 2030	19%	percentage	Measure T-4's implementation target. Based on MDHD ZEV infrastructure expansion (from reach code and ZEV refueling depot) and incentive availability, aligned with ACF compliance timelines.[5]
	Zero-emission vehicle commercial adoption target for 2045	100%	percentage	Measure T-4's implementation target. Aligns with State mandates under the ACF regulation and EO N-79-20 requiring 100% ZEV commercial fleets by 2045.[5]
ZEV Adoption Baseline$_{i,y}$	Zero-emission vehicle adoption baseline	See Table 31	percentage	CARB's EMFAC,[1] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)

Notes: "—" means either reference not applicable or see references for disaggregated parameter in the following table rows. VMT = vehicle miles traveled; ZEV = zero-emission vehicle; kWh = kilowatt-hours; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; ACF = Advanced Clean Fleets; EO = Executive Order.

[1] California Air Resources Board (CARB). EMFAC2021 (v1.0.2) Emissions Inventory. Riverside County. Accessed at: https://arb.ca.gov/emfac/emissions-inventory/ca7ec086c924a9a54a7806297807d5c469a79f95

[2] EPA. Data Explorer, grid gross loss rates, 2019. Accessed at: https://www.epa.gov/egrid/data-explorer

[3] See Table 29.

[4] PlugShare. Best EV Charging Cities in California. Accessed at: https://www.plugshare.com/directory/us/california

[5] CARB. Advanced Clean Fleets Regulation - ZEV Milestones Option (2023). Accessed at: https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-regulation-zev-milestones-option

Table 31 ZEV Adoption GHG Emissions Reduction Calculations

Variable	Definition	Units	VMT Type	2030	2045
Equation 10.2					
VMT$_{i,y}$	Forecasted VMT after Measure T-1, T-2 and T-3 reductions	miles	Passenger	1,734,365,705	1,876,778,277
			Commercial	121,070,186	190,514,700
ZEV Adoption$_{i,y}$	Electric vehicle adoption target	percentage	Passenger	6.72%	9.23%
			Commercial	5.60%	23.24%
ZEV Adoption Baseline$_{i,y}$	Electric vehicle adoption baseline	percentage	Passenger	421,139,087	1,876,778,277
			Commercial	16,219,692	190,514,700
VMT Reduced$_{ICE,I,y}$	Internal combustion engine VMT reduced	VMT	Passenger	1,734,365,705	1,876,778,277
			Commercial	121,070,186	190,514,700
Equation 10.1					
EPM$_{ZEV,i,y}$	Forecasted electricity usage per mile of electric vehicles	kWh/mile	Passenger	0.3666	0.3682
			Commercial	1.1873	1.1415
Elec Converted$_{i,y}$	Electricity from electric vehicle conversion	kWh	Passenger	162,259,423	726,217,370
			Commercial	20,239,984	228,570,015

Variable	Definition	Units	VMT Type	2030	2045
Equation 10					
$EF_{elec,i,y}$	Forecasted residential electricity emission factor	MT CO_2e/kWh	Passenger	0.0001516	0.0000000
			Commercial	0.0001603	0.0000000
$EF_{VMT,I,y}$	Forecasted VMT emission factor	MT CO_2e/mile	Passenger	0.0002842	0.0002476
			Commercial	0.0011862	0.0009534
CO2e ReductionVMT	**VMT GHG emissions reduction**	**MT CO_2e**	**Passenger**	**95,070**	**464,615**
			Commercial	**15,997**	**181,631**

Notes: VMT = vehicle miles traveled; ZEV = zero-emission vehicle; kWh = kilowatt-hour; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.

8.8 Measure T-5 Parameters, Data Sources, and Calculations

Off-road Decarbonization Equations

Equation 11 $CO_2e\ Reduction_{offroad,y} = (Fuel\ Avoided_{SORE,y} * Weighted\ EF_y)+(Fuel\ Replaced_{Diesel,y}*(Weighted\ EF_{Diesel}-EF_{RDiesel}))$

Equation 11.1 $Weighted\ EF_y = CO2e\ Emissions_y/(Fuel_{Gas,y} + Fuel_{Diesel,y} + Fuel_{NG,y})$

Equation 11.2 $Fuel\ Avoided_{SORE,y} = (Fuel_{Gas,y} + Fuel_{Diesel,y} + Fuel_{NG,y}) *Prop_{SORE}*Target_{SORE,y}$

Equation 11.3 $Fuel\ Replaced_{Diesel,y} = Fuel_{Diesel,y} *Prop_{SORE}*(1-Target_{SORE,y})*Target_{Renewable\ Diesel,y}$

Table 32 Off-road Decarbonization Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 11				
$CO_2e\ Reduction_{offroad,y}$	Offroad fuel GHG emissions reduction	See Table 33	MT CO_2e	Calculated
$Fuel\ Avoided_{SORE,y}$	Off-road fuel avoided from applicable SORE equipment (≤ 25 hp)	See Table 33	gallons	Calculated
$Weighted\ EF_y$	Weighted emission factor for all off-road fuels	See Table 33	MT CO_2e/gallon	Calculated using CARB's OFFROAD2021[1] and EPA's Emission Factor Hub,[2] consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Fuel\ Replaced_{Diesel,y}$	Off-road diesel replaced from applicable non-SORE diesel equipment (>25 hp)	See Table 33	gallons	Calculated
$EF_{RDiesel}$	Emissions factor of renewable diesel	0.00308	MT CO_2e/gallon	Neste (as recommended by CARB)[3]
$Weighted\ EF_{Diesel}$	Emissions factor of fossil fuel diesel	0.01050	MT CO_2e/gallon	Inventory
y	Target year	2030 or 2045	year	City identified

Variable	Definition	Value	Unit	Data Source
Equation 11.1				
CO_2e Emissions$_y$	Forecasted off-road GHG emissions	See Table 33	MT CO_2e	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Fuel_{Gas,y}$	Forecasted gasoline use	See Table 33	gallon	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Fuel_{Diesel,y}$	Forecasted diesel use	See Table 33	gallon	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
$Fuel_{NG,y}$	Forecasted natural gas use	See Table 33	gallon	Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets
Equation 11.2				
$Prop_{SORE}$	Proportion of fuel attributable to SORE equipment (≤ 25 hp)	11%	percentage	CARB's OFFROAD2021[1,4]
$Target_{SORE,y}$	Fuel use reduction target for all SORE off-road fuels	See below	percentage	City identified
	Fuel use reduction target for all SORE off-road fuels (2030)	70%	percentage	Based on local ordinance enforcing CARB's SORE regulations, public outreach, and replacement program[5]
	Fuel use reduction target for all SORE off-road fuels (2045)	100%	percentage	Based on local ordinance enforcing CARB's SORE regulations and compliance with State goals established by EO N-79-20.
Equation 11.3				
$Target_{Renewable\ Diesel,y}$	Renewable diesel target for non-SORE diesel off-road fuels	See below	percentage	City identified
	Renewable diesel target for non-SORE diesel off-road fuels (2030)	50%	percentage	Based on local ordinance enforcing CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation, public outreach, and replacement program.[7] Applicability based on CARB's OFFROAD2021.[1,6]
	Renewable diesel target for non-SORE diesel off-road fuels (2045)	100%	percentage	Based on local ordinance enforcing CARB's In-Use Off-Road Diesel-Fueled Fleets Regulation and compliance with State goals established by EO N-79-20.

Variable	Definition	Value	Unit	Data Source

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; SORE = small off-road engine; hp = horsepower; EO = Executive Order.

[1] California Air Resources Board (CARB). 2024. Off-Road Emissions Inventory (OFFROAD2021). Accessed at: https://arb.ca.gov/emfac/offroad/emissions-inventory/18631f2a297444371a33a3180fd7a1316456ab70

[2] U.S. Environmental Protection Agency (EPA). GHG Emission Factors Hub. Available at: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

[3] Neste. My Renewable Diesel. Accessed at: https://www.neste.us/neste-my-renewable-diesel

[4] Moreno Valley's SORE fuel usage in 2030 was estimated by filtering CARB OFFROAD2021 model outputs (for Riverside County in 2030) for horsepower ratings less than or less than 25 and attributing the resulting County-level annual fuel usage to Moreno Valley based on the attribution methodology used in the GHG inventory and forecast. The results were divided by the total estimated off-road fuel usage in Moreno Valley in 2030 to estimate the share, or percentage, of fuel usage attributable to SOREs.

[5] California Air Resources Board (CARB). SORE Applicability Fact Sheet (2021). Accessed at: https://ww2.arb.ca.gov/resources/fact-sheets/sore-applicability-fact-sheet

[6] Moreno Valley's diesel fuel usage in 2030 was estimated based on attributions established in the Moreno Valley 2019 GHG inventory and by filtering CARB OFFROAD2021 model outputs for horsepower ratings greater than or equal to 25 and for equipment categories subject to the In-Use Off-Road Diesel-Fueled Fleets Regulation. The results were divided by the total estimated off-road diesel usage in Moreno Valley in 2030 to estimate the share, or percentage, of fuel usage subject to the In-Use Off-Road Diesel-Fueled Fleets Regulation which accounted for 35% of all diesel fuel use.

[7] California Air Resources Board (CARB). (2022). Final Regulation Order Amendments to Sections 2449, 2449.1, and 2449.2 Title 12, California Code of Regulations. Accessed at: https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/off-roaddiesel/froa-1.pdf

Table 33 Off-road Decarbonization GHG Emissions Reduction Calculations

Variable	Definition	Units	2030	2045
Equation 11.1				
$CO_2e\ Emissions_y$	Forecasted off-road GHG emissions	MT CO_2e	58,354	66,736
$Fuel_{Gas,y}$	Forecasted gasoline use	gallons	1,383,318	1,553,145
$Fuel_{Diesel,y}$	Forecasted diesel use	gallons	4,169,666	4,769,789
$Fuel_{NG,y}$	Forecasted natural gas use	gallons	321,325	410,402
Weighted EFy	Weighted fuel emission factor	MT CO_2e/gallon	0.009934	0.009911
Equation 11.2				
$Fuel\ Avoided_{SORE,y}$	Off-road fuel avoided from applicable SORE equipment (≤ 25 hp)	gallons	466,303	763,560
Equation 11.3				
$Fuel\ Replaced_{Diesel,y}$	Non-SORE off-road fuel replaced from applicable diesel equipment (>25 hp)	gallons	1,848,413	4,228,895
Equation 11				
$\boldsymbol{CO_2e\ Reduction_{Fuel}}$	**Fuel GHG emissions reduction**	**MT CO_2e**	**18,335**	**38,918**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; SORE = small off-road engine; hp = horsepower.

8.9 Measure SW-1 Parameters, Data Sources, and Calculations

Landfilled Organic Waste Reduction Equations

Equation 12 $CO_2e\ Reduction_{LOW,y} = CO_2e\ Emissions_y - CO_2e\ Emissions_{Target}$

Equation 12.1 $CO_2e\ Emissions_{Target} = CO_2e\ Emissions_{2014} * (1-Reduction\ Target_{LOW,y})$

Equation 12.2 $CO_2e\ Emissions_{2014} = (Landfill_{tons,2014} * EF_{waste,2019}) + (Landfill_{tons,2014} * EF_{process,CNG})$

Table 34 Landfilled Organics Reduction Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 12				
$CO_2e\ Reduction_{LOW,y}$	Landfilled organic waste GHG emissions reduction	See Table 35	MT CO_2e	Calculated
$CO_2e\ Emissions_y$	Landfilled organic waste GHG emissions	See Table 35	MT CO_2e	Calculated
$CO_2e\ Emissions_{Target}$	Target landfilled organic waste GHG emissions	See Table 35	MT CO_2e	Calculated
y	Target year	2030 or 2045	year	City identified
Equation 12.1				
$CO_2e\ Emissions_{2014}$	2014 landfilled waste GHG emissions	114,697	MT CO_2e	Calculated
$Reduction\ Target_{LOW,\ y}$	Landfilled organic waste reduction target	See Table 35	percentage	City identified
	Landfilled organic waste reduction target (2030)	75%	percentage	Measure SW-1's implementation target based on compliance with CalRecycle's required activities for SB 1383 and GHG emission factors for solid waste.[1, 2]
	Landfilled organic waste reduction target (2045)	75%	percentage	Measure SW-1's implementation target
Equation 12.2				
$Landfill_{tons,2014}$	Landfill disposal in 2014	120,466	tons	CalRecycle[3]
$EF_{waste,2019}$	Emissions factor of waste stream	0.9411	MT CO_2e/ton	Calculated from CalRecycle's 2014 residential and commercial waste characterization studies for Moreno Valley[4]
$EF_{process,CNG}$	Emissions factor of CNG process landfill	0.0110	MT CO_2e/ton	U.S. Community Protocol, Equation SW.5[5]

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.

[1] CalRecycle. SB 1383 Jurisdiction Responsibilities. Accessed at: https://calrecycle.ca.gov/organics/slcp/jurisdictions/

[2] According to the ICLEI U.S. Community Protocol, Appendix E, GHG emissions are generated by non-biologic wastes only if they are combusted.

[3] CalRecycle. Disposal by Facility. Accessed at: https://www2.calrecycle.ca.gov/LGCentral/DisposalReporting/Destination/DisposalByFacility

[4] CalRecycle. Solid Waste Characterization Home. Accessed at: https://www2.calrecycle.ca.gov/WasteCharacterization/

[5] U.S. Community Protocol. Appenidx E: Solid Waste Emission Activities and Sources (2013). Accessed at: https://icleiusa.org/us-community-protocol/

Table 35 Landfilled Organics Reduction GHG Emissions Reduction Calculations

Variable	Definition	Units	2030	2045
Equation 12.1				
$CO_2e\ Emissions_{2014}$	2014 landfilled waste GHG emissions	MT CO_2e	114,697	114,697
Equation 12				

CO_2e Emissions$_y$	Landfilled organic waste GHG emissions	MT CO_2e	224,336	310,872
CO2e Emissions$_{Target}$	Landfilled organic waste reduction target	MT CO_2e	28,674	28,674
CO2e Reduction$_{LOW,y}$	**Landfilled organic waste GHG emissions reduction**	**MT CO_2e**	**195,661**	**282,198**

Notes: GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent.

8.10 Measure CS-1 Parameters, Data Sources, and Calculations

Compost Procurement Equations

Equation 13 $CO_2e\ Sequestration_y = (Compost_y/CF_{OW\ to\ compost} * CSF_{Compost}) * Compliance\ Target_y$

Equation 13.1 $Compost_y = Population_y * (Ratio_{procure} * CF_{OW\ to\ compost})$

Table 36 Compost Procurement Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 13				
CO_2e Sequestration$_y$	Carbon sequestered from compost procurement and application	See Table 37	MT CO_2e	Calculated
Compost$_y$	Compost procurement required to meet organic waste procurement target	See Table 37	tons	Calculated
$CF_{OW\ to\ compost}$	Conversion factor to convert organic waste procurement target into compost quantity	0.58	compost tons/organic waste tons	CalRecycle's Procurement Calculator Tool[1]
$CSF_{compost}$	Carbon sequestration factor for mixed organic compost application	0.23	MT CO_2e/organic waste ton	CARB's Method for Estimating Greenhouse Gas Emission Reductions from Diversion Of Organic Waste from Landfills to Compost Facilities[2]
Compliance Target$_y$	Compliance target with procurement requirement (2030 and 2045)	100%	percentage	City identified; estimated based on compliance with CalRecycle's required activities for SB 1383 compliance[3]
y	Target year	2030 or 2045	year	City identified
Equation 13.1				
Population$_y$	Forecasted population	See Table 37	people	Moreno Valley 2024 General Plan Update, consistent with GHG Forecast (Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets)
$Ratio_{procure}$	Organic waste procurement required per capita	0.08	compost tons/people	CalRecycle's Procurement Calculator Tool[1]

Variable	Definition	Value	Unit	Data Source

Notes: "-" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent.

[1] CalRecycle. Procurement Calculator Tool. Accessed at: https://calrecycle.ca.gov/organics/slcp/reporting/

[2] CARB. Method for Estimating Greenhouse Gas Emission Reductions from Diversion Of Organic Waste from Landfills to Compost Facilities (2017). Accessed at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/waste/cerffinal.pdf

[3] CalRecycle. SB 1383 Jurisdiction Responsibilities. Accessed at: https://calrecycle.ca.gov/organics/slcp/jurisdictions/

Table 37 Compost Procurement GHG Emissions Reduction Calculations

Variable	Definition	Units	2030	2045
Equation 13.1				
$Population_y$	Forecasted population	people	240,428	327,446
$Compost_y$	Compost procurement required to meet organic waste procurement target	ton	11,156	15,194
Equation 13				
CO_2e $Sequestration_y$	**Carbon sequestered from compost procurement and application**	**MT CO_2e**	**4,424**	**6,025**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent.

8.11 Measure CS-2 Parameters, Data Sources, and Calculations

Tree Plantings Equations

Equation 14 $CO_2e\ Sequestration_y = Rate_{trees} * CSF_{Tree} * N_{e,y}$

Equation 14.1 $N_{e,y} = (Y_{n,y} *(Y_{n,y} + 1))/2$

Equation 14.2 $Y_{n,y} = (y - Year_b)+1$

Table 38 Tree Plantings Parameters and Data Sources

Variable	Definition	Value	Unit	Data Source
Equation 14				
CO_2e $Sequestration_y$	Carbon sequestered from tree plantings	See Table 39	MT CO_2e	Calculated
$Rate_{trees}$	Rate of trees planted per year	200	trees/year	Measure CS-2 target based on Urban Forest Management Plan as seen in Oakland and Fremont,[1,2] and Moreno Valley's Tree Care ordinance.
CSF_{Tree}	Carbon sequestration factor for tree seedlings	0.035	MT CO_2e/tree/year	CAPCOA[3]
N_e	Effective number of years carbon is being sequestered[4]	See Table 39	years	Calculated
y	Target year	2030 or 2045	year	City identified
Equation 14.1				

Variable	Definition	Value	Unit	Data Source
Y_n	Total number of years in which trees are planted	See Table 39	years	Calculated
Equation 14.2				
$Year_b$	Baseline tree planting year	2026	year	Measure CS-2 implementation year

Notes: "–" means either reference not applicable or see references for disaggregated parameter in the following table rows. MT CO_2e = metric tons of carbon dioxide equivalent.

[1] City of Oakland. Oakland Urban Forest Plan. Accessed at: https://www.oaklandca.gov/projects/oakland-urban-forest-plan

[2] City of Fremont. Primary Framework: Urban Forest Management Plan (2023). Accessed at: https://www.fremont.gov/home/showpublisheddocument/14603/638381633196370000

[3] Default annual CO_2e sequestration per tree per year with a maximum lifespan of 20 years per tree is 0.0354 MT CO_2e/tree/year was obtained from CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures.

[4] The effective number of years of carbon sequestration represents the total cumulative years during which a given number of trees sequester carbon. Since the goal is based on the number of trees planted annually, this metric captures the cumulative sequestration time for each annual planting cohort. This calculation leverages the Gaussian summation principle, which simplifies summing sequences by recognizing patterns or symmetry, enabling efficient calculation of consecutive or structured series.

Table 39 Tree Plantings GHG Emissions Reduction Calculations

Variable	Definition	Units	2030	2045
Equation 14.2				
Y_n	Total number of years in which trees are planted	years	5	20
Equation 14.1				
N_e	Effective number of years carbon is being sequestered	years	15	210
Equation 14				
CO_2e Sequestration	**Carbon sequestration from tree plantings**	**MT CO_2e**	**106**	**1,487**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent.

APPENDIX E

CALIFORNIA ENVIRONMENTAL QUALITY ACT GREENHOUSE GAS EMISSIONS ANALYSIS COMPLIANCE CHECKLIST

CITY OF MORENO VALLEY CALIFORNIA ENVIRONMENTAL QUALITY ACT GREENHOUSE GAS EMISSIONS ANALYSIS COMPLIANCE CHECKLIST

Moreno Valley Climate Action Plan
Consistency Checklist for Future Development[1]

Version: July 7, 2025

On [insert adoption date], the City of Moreno Valley adopted the Moreno Valley Climate Action Plan (CAP) which establishes 2030 and 2045 greenhouse gas (GHG) emissions reduction targets and provides measures and actions to reduce GHG emissions within the community and achieve those targets. The CAP includes specific measures and actions to achieve the communitywide GHG emissions reduction target of a 65 percent reduction below 1990 per capita GHG emissions levels by 2030 and make substantial progress towards the 2045 target for carbon neutrality. This exceeds California's goal of reducing GHG emissions by 40 percent below 1990 levels by 2030 (pursuant to Senate Bill 32, 2016) and provides substantial progress towards achieving the State's GHG reduction goal of carbon neutrality by 2045 (pursuant to Assembly Bill 1279, 2023). The Moreno Valley City Council, City staff, and community will continue to develop an approach to meet the State's 2045 goal of carbon neutrality.

Pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15183.5, a lead agency may determine that a project's or plan's incremental contribution to a GHG emissions cumulative effect is not cumulatively considerable if the project or plan complies with the requirements in an adopted plan or mitigation program for the purpose of reducing GHG emissions under specified circumstances. For the CAP to be considered a qualified GHG reduction strategy and provide for CEQA streamlining of GHG emissions analysis for future development, the CAP must identify those measures and actions that are applicable to future development projects. Specifically, the CAP includes measures and actions that are applicable to existing and future development for public and private projects. GHG reduction programs that are applicable to future development are summarized in the following CEQA GHG Emissions Analysis Compliance Checklist (referred to herein as the CEQA GHG Checklist). This CEQA GHG Checklist identifies applicable measures from the CAP, as well as other State and local sustainability regulations and requirements. The purpose of the CEQA GHG Checklist is to assist with determining project or plan consistency with the CAP and provide a streamlined review

[1] Future development refers to any project or plan that is subject to discretionary review and triggers environmental review pursuant to CEQA. Projects with published Notice of Preparations, submitted application packages, and/or other official documentation that predate the adoption of the CAP and CEQA GHG Emissions Thresholds are not required to utilize this CEQA GHG Checklist and/or the CEQA GHG Emissions Thresholds, at the discretion of the City as the CEQA Lead Agency.

process for proposed future projects and plans that are subject to discretionary review and trigger environmental review pursuant to CEQA.

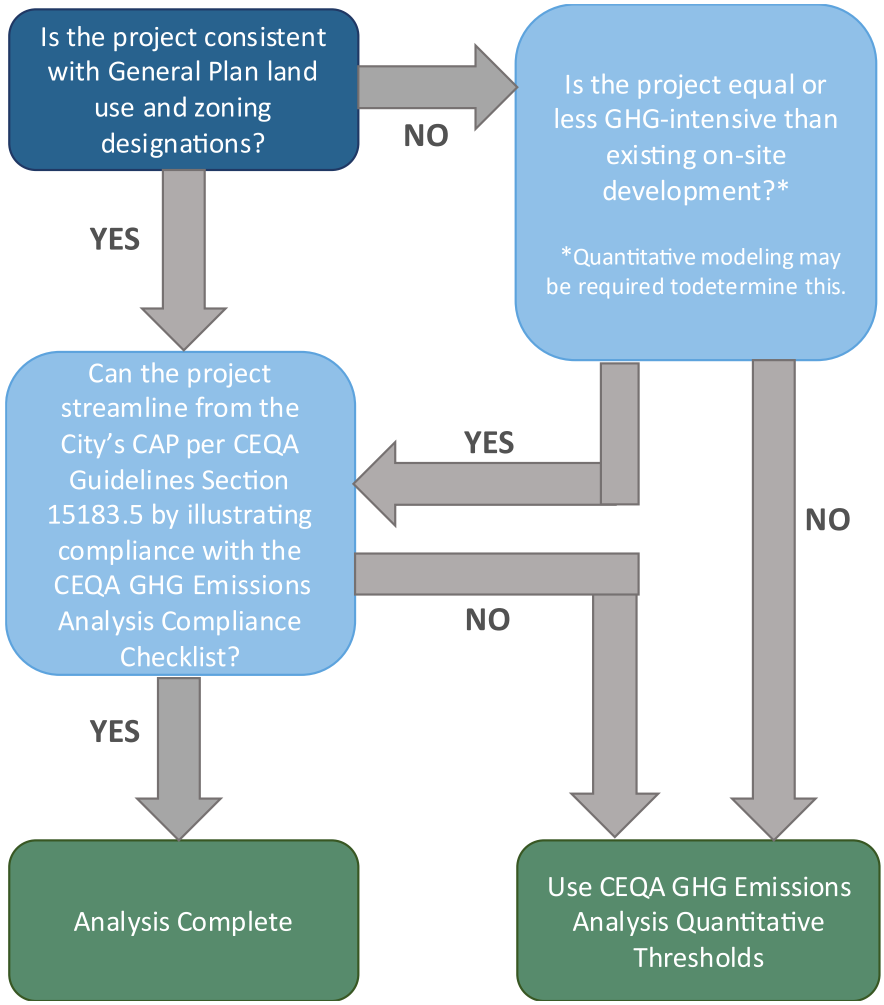
This CEQA GHG Checklist contains measures and actions that are essential to be implemented on a project-by-project basis, as applicable, to meet the specified GHG emissions targets identified in the CAP. Implementation of these measures and actions would demonstrate that future development is consistent with CAP assumptions and assist Moreno Valley in achieving its identified GHG reduction targets. Projects or plans that are consistent with the CAP (as determined through the use of this CEQA GHG Checklist) may rely on the Moreno Valley 2040 Revised Program Environmental Impact Report for the respective project- and cumulative-level GHG emissions impacts analysis. Land-use types that may streamline CEQA GHG emissions analysis using this CEQA GHG Checklist include residential, commercial (e.g. retail, office, mixed-use developments, restaurants, hotels, shopping centers, entertainment venues, schools, hospitals, research centers, etc.),[2] and municipal uses. Industrial projects and emissions generated by those sources are generally regulated by the California Air Resources Board (CARB) and are not under the City's direct operational control. Therefore, this checklist does not apply to industrial projects.

Inconsistency with any of the applicable by-land-use-type measures and actions in this CEQA GHG Checklist would make a plan/project inconsistent with the overall CAP. **Projects that are identified as not consistent with the CAP via this CEQA GHG Checklist must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions compared to Moreno Valley CEQA GHG Emissions Thresholds adopted [insert adoption date], and incorporate the CAP measures and actions in this CEQA GHG Checklist to the extent feasible.[3]** The process for determining whether a project or plan may utilize this CEQA GHG Checklist for streamlining or whether a quantitative GHG emissions analysis is required is illustrated in Figure 1, below.

[2] Warehouses may not streamline CEQA GHG emissions analysis using this CEQA GHG Checklist because warehouses are considered to be outside the purview of the Moreno Valley CAP. Gas and electric utilities typically classify facilities into residential, commercial, and industrial categories based on the type of activity performed and level of energy consumption. While warehouses primarily engage in commercial activities, they can consume electricity at high rates and are often part of industrial real estate. The gas and electric utilities serving Moreno Valley did not confirm whether warehouses are included in the commercial or industrial use category in their energy reporting. Because industrial uses are excluded from the CAP's GHG inventory and it is unknown how the utilities categorize warehouses, warehouses have been considered to be outside the purview of this CAP to remain conservative.

[3] The Moreno Valley CEQA GHG Emissions Thresholds and Guidance Report on the preparation of quantitative GHG emissions analyses is included as Appendix F to the Moreno Valley CAP.

Figure 1 **Determining Consistency with the Moreno Valley CAP**



APPLICATION SUBMITTAL REQUIREMENTS

This CEQA GHG Compliance Checklist is required to accompany the Application Materials submitted to the City for all projects and plans subject to CEQA review that are not deemed statutorily or categorically exempt. The CEQA GHG Checklist is designed to assist the applicant and the City in identifying the minimum CAP and other applicable climate-focused requirements specific to a proposed project or plan. However, it may be necessary to supplement the completed CEQA GHG Checklist with supporting information, materials, calculations, or certifications to demonstrate compliance with CAP and other applicable climate-focused requirements. If the minimum CAP and other applicable climate-focused requirements are not already clearly committed to as part of the CEQA project description, the completed CEQA GHG Checklist shall be included in the respective project or plan description and referenced in the respective conditions of approval.

Definitions

All Project Types- “All Project Types” refers to all new developments or major renovations/remodels for residential, mixed-use, commercial, and institutional land uses. Industrial projects and emissions generated by those sources are regulated by CARB and are not under the City’s direct operational control. Therefore, this checklist does not apply to industrial projects.

Dual Plumbing- A "Dual plumbed system" or "dual plumbing" means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for landscape irrigation and plumbing outlets (e.g., toilets, urinals) within a building.

Graywater Ready- Is a system that collects water from graywater sources (clothes washers, showers, lavatory faucets, etc.) separately from blackwater sources (i.e. toilets, kitchen faucets, and dishwashers). Graywater can then be utilized to supply water for landscaping irrigation and toilets.

Major Renovations - Qualifying major renovations include any repair, reconstruction, rehabilitation, alteration, addition or other improvement of a building or structure where either:

1) The cost of the renovation equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started, or;
2) The square footage of the renovation exceeds 50 percent of the square footage of the structure before the improvement or repair is started.

Major Transit Stop- Major Transit Stop is defined by Assembly Bill (AB) 2553 (2024) as a rail or bus rapid transit station, a ferry terminal served by bus or rail, or the intersection of two or more major bus routes with a frequency of service of 20 minutes or less during peak commute periods.

GENERAL PROJECT INFORMATION

Project or Plan Name:	
Address:	
Assessor's Parcel Number(s):	
Date Submitted:	
Applicant Name: ____________________________ Company Name (if applicable): ____________________ Company Address: _____________________________	Contact Phone: ___________________________ Contact Email: ____________________________
Was a consultant retained to complete this checklist? Yes☐ No☐ If Yes, complete the following:	
Consultant Name: ____________________________ Company Name: _____________________________ Company Address: _____________________________	Contact Phone: ___________________________ Contact Email: ____________________________
Project Information (description summary)	
What is the size of the project site or plan area (acres)? **Gross:** __________________________ **Net:** ____________________________	
If proposing a Major Renovation: Square-footage of renovation: Square-footage of existing development: Cost of renovation: Market value of existing development:	
Identify all applicable proposed land uses: ☐ Residential (indicate # of single-family dwelling units): ☐ Residential (indicate # of multi-family dwelling units): ☐ Commercial (indicate total square footage, gross and net): ☐ Municipal (indicate total square footage, gross and net): ☐ Other (describe):	

Project description. This description shall be consistent with the project description that will be used for the CEQA document. The description may be attached to the GHG Checklist if there are space constraints.

COMPLIANCE CHECKLIST TABLE

Section 1: LAND USE CONSISTENCY			
Regulation	**Requirements**	**Project/Plan Compliance**	**Required Explanation[4]**
Moreno Valley 2024 General Plan Update	1a. Does the Project/Plan include a General Plan Amendment?	Yes☐ No☐ N/A☐	______ ______ ______ ______
Moreno Valley Zoning Code	1b. Does the Project/Plan include a Zoning Map Amendment/Rezoning, and/or Zoning Text Amendment? *If "No" for questions 1a. and 1b., proceed to Section 2: CAP Measures Consistency. If "Yes" to either question 1a or 1.b, the applicant shall prepare a Project/Plan-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions compared to Moreno Valley CEQA GHG Emissions Thresholds and incorporation of the CAP measures in this CEQA GHG Checklist to the extent feasible.*	Yes☐ No☐ N/A☐	______ ______ ______ ______

[4] Every question included in this CEQA GHG Checklist is required to be answered with explanation of either: 1) how it will be achieved, 2) why it will not be achieved, or 3) why it is not applicable. References to the plan set page number or other project description detail should be provided to demonstrate compliance.

Section 2: CAP MEASURES CONSISTENCY			
Measure No.	**Requirements**	**Project/Plan Compliance**[5]	**Required Explanation**
Building Energy			
Building Decarbonization and Energy Efficiency			
Measures BE-2, BE-3, BE-4, and BE-5	2. **All Project Types – Energy-Efficient Design.** Will the Project/Plan comply with the latest version of the Building Energy Efficiency Standards (Title 24, Part 6),[6] CALGreen Code,[7] and any applicable Moreno Valley Building Energy Appliance Reach Codes or Energy Score Ordinances ?	Yes☐ No☐ N/A☐	____ ____ ____ ____
Measures BE-4, and BE-5	3.**All Project Types – Energy-Efficient Air Conditioning.** As an option, will the Project/Plan include central air conditioning unit installations and replacements that are two-way, providing both heating and cooling with a single unit?	Yes☐ No☐ N/A☐	____ ____ ____ ____
Measures BE-2 and BE-3	4.**All Project Types – Building Decarbonization.** Will the Project/Plan include decarbonized new construction and applicable major renovations, including for heating, cooking, and water heating?[8]	Yes☐ No☐ N/A☐	____ ____ ____ ____

5 "No" responses to checklist items, except for those that include "as an option" in the language, indicate that a quantitative GHG emissions analysis shall be required for the Plan/Project. Checklist items that include "as an option" in the language are voluntary in nature.

6 As of the date of this current CEQA GHG Checklist, the 2022 Building Energy Efficiency Standards are in effect. Beginning January 1, 2026, the 2025 Building Energy Efficiency Standards will apply. For more information visit: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards.

7 As of the date of this current CEQA GHG Checklist, the 2022 CALGreen Code is in effect. Beginning January 1, 2026, the 2025 CALGreen Code will apply. For more information visit: https://www.dgs.ca.gov/BSC/CALGreen.

8 A "Yes" to this checklist item means that all heating, cooking, and water heating appliances are electrified.

Renewable Energy			
Measure BE-6	5. **All Project Types – Solar and Battery Storage Requirements.** As applicable, will the Project/Plan include installation of a solar photovoltaic (PV) and battery storage system in accordance with the requirements of the current version of Building Energy Efficiency Standards (Title 24, Part 6)?[9]	Yes☐ No☐ N/A☐	______ ______ ______
Measure BE-6	6. **Nonresidential Projects –** As an option, will the Project/Plan install solar PV on at least 50 percent of usable roof space and install battery storage?	Yes☐ No☐ N/A☐	______ ______ ______
Transportation			
Multi-Modal Transportation			
Measure T-1	7. **All Project Types – Bicycle Parking.** Will the Project/Plan comply with the latest version of the Moreno Valley Municipal Code Section 9.11.060[10] or CALGreen Code,[11] whichever has the greater requirement, for provision of bicycle parking?	Yes☐ No☐ N/A☐	______ ______ ______ ______
Measure T-2	8. **All Project Types – Parking Requirements.** If located within 0.5-mile of a Major Transit Stop, would the Plan/Project implement reduced parking consistent with AB 2097 (2022)[12] and AB 2553 (2024)?[13]	Yes☐ No☐ N/A☐	______ ______ ______ ______

[9] As of the date of this current CEQA GHG Checklist, the 2022 Building Energy Efficiency Standards are in effect. Beginning January 1, 2026, the 2025 Building Energy Efficiency Standards will apply. Available at: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards.

[10] Available at: https://ecode360.com/43230888#43230943

[11] Available at: https://www.dgs.ca.gov/bsc/calgreen

[12] Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB2097

[13] Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB2553

Vehicle and Off-road Equipment Decarbonization			
Measure T-4	9. **All Project Types – Electric Vehicle Chargers.** Will the Project/Plan comply with the CALGreen[14] Tier 2 requirements for electric vehicle (EV) charging parking spaces?	Yes☐ No☐ N/A☐	________ ________ ________ ________
Measure T-5	10. **All Project Types – Off-Road Equipment Decarbonization.** Will the Project/Plan include the use of zero-emission (e.g., electric, renewable diesel) off-road construction and landscaping equipment (e.g., mowers, chippers, tractors)?	Yes☐ No☐ N/A☐	________ ________ ________ ________ ________ ________
Solid Waste			
Measure SW-1	11. **All Project Types – Landfill Diversion.** Will the Project/Plan meet current legislation (e.g., California SB 1383 [2016], AB 1276 [2021]) and Moreno Valley Municipal Code Chapters 6.02 and 6.03[15] requirements for inclusion of solid waste sorting and disposal receptacles to support the CAP and Statewide goals to sort, recycle, and collect recyclables and reduce landfilled garbage?	Yes☐ No☐ N/A☐	________ ________ ________ ________

[14] Available at: https://www.dgs.ca.gov/bsc/calgreen
[15] Available at: https://ecode360.com/43225954

Measure SW-1	12. **All Project Types – Organics Recycling Requirement.** Will the Project/Plan meet SB 1383 (2016)[16] legislation and Moreno Valley Municipal Code Chapters 6.02 and 6.03[17] requirements by requiring that residences and businesses provide organic waste disposal containers and post educational signage to encourage Project/Plan occupants to sort, compost, and collect organic waste to support the goal of achieving a 75 percent reduction of landfilled organic waste compared to 2014 levels?	Yes☐ No☐ N/A☐	______ ______ ______
Measure SW-1	13. **All Project Types – Construction and Demolition Debris Recycling.** Will the Project/Plan achieve a 65 percent diversion from landfill rate for construction waste in accordance with CALGreen requirements?	Yes☐ No☐ N/A☐	______ ______ ______
Water Use			
Measure WW-1	14. **All Project Types – Water Conservation.** Will the Project/Plan meet the water-efficiency standards established by the latest version of the CALGreen[18] code by including water efficient fixtures and appliances?	Yes☐ No☐ N/A☐	______ ______ ______
Measure WW-1	15. **All Project Types – Water Efficient Landscaping.** Will the Project/Plan comply with the requirements of Moreno Valley Municipal Code Chapter 9.17[19] by including water efficient landscaping and landscaping irrigation systems?	Yes☐ No☐ N/A☐	______ ______ ______
Measure WW-1	16. **All Project Types – Dual Plumbing.** As an option, will the Project/Plan include development that is built with dual plumbing or graywater ready plumbing that can utilize recycled water or graywater for landscape watering and toilets?	Yes☐ No☐ N/A☐	______ ______ ______

16 Available at: https://calrecycle.ca.gov/organics/slcp/
17 Available at: https://ecode360.com/43225954
18 Available at: https://www.dgs.ca.gov/bsc/calgreen
19 Available at: https://ecode360.com/43233174

Urban Forest			
Measure CS-2	17. **All Project Types – Tree Planting.** Will the Project/Plan include new climate-adaptive/drought tolerant trees and landscaping[20] (as applicable) in order to increase the Citywide urban forest?	Yes☐ No☐ N/A☐	______ ______ ______

Section 3: Summary and Signature

Final Consistency Determination	Does the Project/Plan incorporate all applicable and non-optional checklist items? If no, Project/Plan requires quantitative GHG emissions assessment.	Yes☐ No☐
Signature(s)	Signatures for the checklist preparer and/or Project/Plan applicant/proponent should be added below to indicate that this checklist has been filled out accurately and the Project/Plan has committed to including the Checklist Items above marked with “Yes” in the Project/Plan design.	

Checklist Prepared by: ___________________________________
(Name)

Checklist Prepared by: ___________________________________
(Signature)

Checklist Prepared on: ___________________________________
(Date)

[20] Refer to the California Native Plant Society’s Planting Guide for Riverside County for examples: https://www.bewaterwise.com/assets/mwd_plantguide-screen_riverside_4.16.pdf.

APPENDIX F

CALIFORNIA ENVIRONMENTAL QUALITY ACT GREENHOUSE GAS EMISSIONS THRESHOLDS AND GUIDANCE REPORT

California Environmental Quality Act Greenhouse Gas Emissions Thresholds and Guidance

Draft Report

prepared by

City of Moreno Valley
Community Development Department
14177 Frederick Street
Moreno Valley, California 92552

prepared with assistance from

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July 2025

RINCON CONSULTANTS

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1 Introduction

1.1 Greenhouse Gas Emissions Analyses Under the California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires discretionary plans and projects to undergo an environmental review process, which includes an evaluation of plan- or project-related greenhouse gas (GHG) emissions.[1] Section 15183.5 of the CEQA Guidelines establishes a framework for developing a qualified GHG reduction plan[2] to cumulatively reduce GHG emissions and allow lead agencies to analyze and mitigate the effects of plan- and project-level GHG emissions. This CEQA GHG Emissions Thresholds and Guidance Report is intended to provide methodological guidance and quantitative thresholds of significance for use by City planners, applicants, consultants, agencies, and members of the public in the preparation of GHG emissions analyses under CEQA for plans and projects located within the City of Moreno Valley.

The City prepared a GHG reduction plan, titled the Moreno Valley Climate Action Plan (CAP), which is consistent with CEQA Guidelines Section 15183.5. The CAP sets targets for achieving a 65 percent reduction below 1990 per capita GHG emissions levels by 2030 and carbon neutrality by 2045.[3,4] For ease of context and tracking GHG emissions reduction progress, the per capita GHG emissions targets are converted to and discussed in this report as mass GHG emissions. The per capita GHG emissions targets are equivalent to reducing GHG emissions to 987,683 metric tons of carbon dioxide equivalent (MT CO_2e) by 2030 and net zero MT CO_2e by 2045. While the City Council, City staff, and community will continue to develop an approach to the longer-term target of carbon neutrality, the Moreno Valley CAP includes specific measures and actions to achieve the shorter-term target by reducing per capita GHG emissions by just over 65 percent below 1990 emissions by 2030 (equivalent to 986,572 MT CO_2e in 2030). This target and GHG emissions reduction strategy exceed California's goal of reducing GHG emissions to 40 percent below 1990 levels by 2030, pursuant to Senate Bill (SB) 32 (2016). The longer-term target for carbon neutrality by 2045 aligns with California's goal of carbon neutrality by 2045, pursuant to Assembly Bill (AB) 1279 (2023).

The Moreno Valley CAP includes procedures to evaluate Moreno Valley's GHG emissions to assess "substantial progress" toward achieving long-term reduction targets identified in the Moreno Valley CAP. The Moreno Valley CAP also includes commitments and mechanisms to adopt additional policies to achieve the GHG emissions reduction necessary to make substantial progress toward

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[1] Refer to Appendix A for an overview of GHG emissions and climate change.

[2] To be a qualified GHG reduction plan, a plan must meet the requirements of CEQA Guidelines Section 15183.5, as further discussed in Section 1.2.

[3] Carbon neutrality is defined as net zero carbon emissions, which is achieved either by balancing carbon emissions with carbon removal or by completely eliminating carbon emissions.

[4] Moreno Valley's per capita GHG emissions reduction targets have been developed based on sector-specific, local GHG data that was translated to a per capita basis based on population. This target-setting methodology is consistent with the California Air Resources Board's (CARB) 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) which recommends that jurisdictions develop locally appropriate, plan-level targets.
California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality (2022). Accessed at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.

Moreno Valley's long-term reduction target. This approach is important, because these targets have been set at levels that achieve California's fair share of international GHG emissions reduction goals that would stabilize global climate change effects and avoid the adverse environmental consequences of climate change.

To support progress toward Moreno Valley's longer-term carbon neutrality target, plans and projects within Moreno Valley that undergo CEQA review will need to demonstrate consistency with the GHG emissions reduction strategy in the Moreno Valley CAP, which is a qualified GHG emissions reduction plan (consistent with CEQA Guidelines Section 15183.5) upon adoption of this CEQA GHG Emissions Thresholds and Guidance Report, the Moreno Valley CAP, and the 2024 General Plan Update following environmental review in the associated Revised Program Environmental Impact Report (Revised EIR). Chapter 2, *Moreno Valley Climate Action Plan Summary*, provides an overview of the Moreno Valley CAP and the associated GHG emissions inventories, reduction measures, and forecasts included therein. In addition, Chapter 3, *Regulatory and Legal Setting*, offers an overview of relevant regulations and case law pertaining to the analysis of GHG emissions consistent with CEQA and the CEQA Guidelines.

Plans and projects that are consistent with the Moreno Valley CAP demographic projections (i.e., residents and employees) and land use assumptions,[5] would be able to tier from the adopted Moreno Valley CAP and CEQA GHG Emissions Thresholds and Guidance Report pursuant to CEQA Guidelines Section 15183.5 with regard to CEQA GHG emissions analysis. To streamline this CEQA GHG emissions analysis process, the City has prepared a CEQA GHG Emissions Analysis Compliance Checklist that can be utilized in plan- and project-level CEQA review documents to determine whether proposed plans and projects are consistent with the Moreno Valley CAP GHG emissions reduction strategy. Chapter 4, *Determining Consistency with the Moreno Valley Climate Action Plan*, includes guidance on how to navigate this consistency determination process.

For plans or projects that are not consistent with the Moreno Valley demographic projections and land use assumptions or are not consistent with the CEQA GHG Emissions Analysis Compliance Checklist, a different methodology and assessment utilizing quantitative thresholds of significance would be necessary to evaluate GHG emissions impacts. Chapter 5, *Utilizing Quantitative California Environmental Quality Act Greenhouse Gas Thresholds*, includes guidance on how to utilize the quantitative thresholds that were developed for purposes of evaluating the level of significance of GHG emissions impacts.[6] Furthermore, Chapter 6, *Quantifying Greenhouse Gas* Emissions, provides direction regarding how to quantify a plan or project's GHG emissions for comparison to the applicable threshold of significance.

The Moreno Valley CAP acknowledges that additional actions beyond those identified in the plan will be required to achieve the long-term target of carbon neutrality by 2045. As a result, the plan provides a mechanism for monitoring CAP implementation progress with key performance indicators, conducting GHG emissions inventories every two to three years, and preparing a new CAP if measurable and sufficient progress towards the GHG emissions reduction targets is not made (with a new CAP expected to be initiated by 2029 regardless of progress to address GHG emissions reduction beyond 2030). Chapter 7, *Moving Into the Future*, offers further explanation of how CEQA

[5] Demographic projections used in the Moreno Valley CAP are consistent with the projections used in the Revised EIR for the Moreno Valley 2024 General Plan Update.

[6] In compliance with CEQA Guidelines Section 15064.7(b), this guidance document and the quantitative thresholds contained herein will be presented to the City Council for formal adoption, which includes a public input opportunity.

review of plans and projects could be affected by future updates and/or iterations of the Moreno Valley CAP.

1.2 Qualified Greenhouse Gas Emissions Reduction Plan

According to CEQA Guidelines Section 15183.5, project-specific environmental documents can tier from, or incorporate by reference, the existing programmatic review of a qualified GHG emissions reduction plan. This process allows for project-level evaluation of GHG emissions through the comparison of a project's consistency with the GHG emissions reduction strategy included in the respective qualified GHG emissions reduction plan. To meet the requirements of CEQA Guidelines Section 15183.5, a qualified GHG emissions reduction plan must include the following:

1. Quantify existing and projected GHG emissions within the plan area;
2. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
3. Identify and analyze sector specific GHG emissions within the plan's geographic area;
4. Specify measures or a group of measures, including performance standards, that if implemented, would collectively achieve the specified emissions level;
5. Establish a tool or mechanism to monitor progress and to require amendment if the plan is not achieving specified levels; and
6. Be adopted in a public process following environmental review.

Development projects can demonstrate consistency with a qualified GHG emissions reduction plan if they are consistent with the plan's assumptions regarding future growth projections and consistent with the plan's GHG emissions reduction measures.[7] Projects consistent with the qualified GHG reduction plan, including conformance with performance measures applicable to the project, would not require additional GHG emissions analysis or mitigation under CEQA Guidelines Sections 15064(h) and 15183.5(b)(2). The City has developed the CEQA GHG Emissions Analysis Compliance Checklist to assist with determining project consistency with the Moreno Valley CAP. The checklist is intended to provide individual projects the opportunity to demonstrate that they are minimizing GHG emissions while ensuring new developments achieves their proportion of GHG emissions reduction consistent with the assumptions of the Moreno Valley CAP. Project consistency with a GHG emissions reduction plan can also be demonstrated through a quantitative analysis that demostrates the project would not impede (or would facilitate) Moreno Valley's ability to meet the GHG emissions reduction targets.

Table 1 summarizes the consistency of the Moreno Valley CAP with these requirements for year 2030 (the next California milestone target year for GHG emissions reduction). As shown in Table 1, upon adoption of the CEQA GHG Emissions Thresholds and Guidance Report and approval of the Moreno Valley CAP by the City Council, the Moreno Valley CAP will meet the requirements of a qualified GHG emissions reduction plan per CEQA Guidelines Section 15183.5(b)(1) for projects through 2030.

[7] CAPs typically utilize growth projections from the local jurisdiction's General Plan or applicable Metropolitan Planning Organization's regional demographic forecast.

Table 1 Moreno Valley CAP Consistency with CEQA Guidelines Section 15183.5(b)(1) for 2030

CEQA Guidelines Section 15183.5(b)(1) Requirement	Moreno Valley CAP Consistency
Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.	**Consistent.** The Moreno Valley CAP includes a communitywide GHG emissions inventory for 2019 and forecasts GHG emissions for years 2030 and 2045.[8]
Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.	**Consistent**. The Association of Environmental Professionals (AEP) (2016) *Beyond 2020 and Newhall* white paper identifies this threshold as being a local target that aligns with the State legislative goals.[9] The Moreno Valley CAP establishes a near-term target of a 65 percent reduction below per capita 1990 emissions levels by 2030 and a long-term target of carbon neutrality by 2045, as discussed in Section 2.3, *Greenhouse Gas Emissions Forecast*. Implementation of the CAP would exceed California's 2030 target. Therefore, this local target establishes a level from which activities covered by the plan would not be cumulatively considerable.
Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.	**Consistent.** The Moreno Valley CAP's communitywide GHG emissions inventory and forecasts include the GHG emissions sources directly and indirectly influenced by activities occurring within the City of Moreno Valley's city limits boundary. The city limits boundary encompasses the geographical scope for which the City of Moreno Valley can make land use decisions and set policies to effectively reduce GHG emissions within the Moreno Valley community. The inventory and forecasts break down Moreno Valley's GHG emissions into seven sectors (building electricity, building natural gas, on-road transportation, off-road equipment, solid waste, wastewater, and water).
Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.	**Consistent.** The Moreno Valley CAP specifies measures and actions that the City will enact and implement between 2025 and 2030 to exceed the 2030 GHG emissions reduction target. The GHG emissions reduction plan includes substantial evidence that provides support that the identified GHG emissions reduction measures can achieve the identified target and establishes a threshold where GHG emissions are not cumulatively considerable.
Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels.	**Consistent.** The Moreno Valley CAP includes key performance indicators for each measure and a process to complete community GHG emissions inventories every two to three years. Together the key performance indicators and inventories will allow the City to measure progress towards meeting the Moreno Valley CAP targets. If monitoring indicates that Moreno Valley is not on track to meet the Moreno Valley CAP GHG emissions reduction targets, additional updates may be required at that time to increase GHG emissions reduction measures and actions and maintain the Moreno Valley CAP's status as a CEQA-qualified GHG emissions reduction plan.
Be adopted in a public process following environmental review.	**Consistent.** The City prepared the Moreno Valley CAP and CEQA GHG Emissions Thresholds and Guidance Report which were made available for public review and comment on the City's website. The CAP and CEQA GHG Emissions Thresholds and Guidance Report will be adopted by the City Council along with the 2024 General Plan Update following environmental review through the Revised EIR which was circulated for public review and comment.

[8] The City selected 2019 as the calendar year for Moreno Valley's community GHG emissions inventory because this was the year with most complete data available at the time of completion. Selecting a pre-COVID-19 pandemic baseline year also avoids potential distortions in GHG emissions trends due to the temporary reductions in activity caused by the COVID-19 pandemic.

[9] Association of Environmental Professionals (AEP). Final White Paper. Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California (2016). Accessed at: https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf

CEQA Guidelines Section 15183.5(b)(1) Requirement	Moreno Valley CAP Consistency

Source: City of Moreno Valley. Draft Moreno Valley Climate Action Plan. April 2025.

2 Moreno Valley Climate Action Plan Summary

The following sections provide an overview of the Moreno Valley CAP, including the 2019 communitywide GHG emissions inventory, the communitywide GHG emissions forecast through 2045, and the proposed GHG emissions reduction strategy.

2.1 Communitywide Greenhouse Gas Emissions Inventory

The City has completed a communitywide GHG emissions inventory for 2019, which is summarized in Table 2. Table 2 also provides estimated 1990 emissions levels for informational purposes. As shown therein, communitywide GHG emissions declined by approximately 10 percent between 1990 and 2019.

Table 2 Moreno Valley 1990 and 2019 Communitywide GHG Emissions Levels

Sector	1990 [1] (MT CO_2e)	2019 (MT CO_2e)	Percent Change from 1990 to 2019
Building Electricity	N/A	189,522	N/A
Building Natural Gas	N/A	183,935	N/A
On-road Transportation	N/A	658,678	N/A
Off-road Equipment	N/A	56,673	N/A
Solid Waste	N/A	160,875	N/A
Wastewater	N/A	889	N/A
Water	N/A	7,020	N/A
Total	**1,401,312**	**1,257,593**	**-10%**

MT CO_2e = metric tons of carbon dioxide equivalent; N/A = not applicable. Values may not add up to totals due to rounding.

[1] 1990 GHG emissions were estimated by back-casting Moreno Valley's total 2019 GHG emissions based on the change in the State's GHG emissions between 2019 and 1990, excluding sectors that are not within Moreno Valley. It is assumed that the change in Moreno Valley's GHG emissions from 2019 to 1990 is equal to the State's change in GHG emissions of the same time period. 1990 GHG emissions for Moreno Valley were not estimated at the individual sector level.

Source: City of Moreno Valley. Moreno Valley CAP, Appendix B: 2019 Greenhouse Gas Emissions Inventory and Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets (2025).

2.2 Greenhouse Gas Emissions Reduction Strategy

The Moreno Valley CAP includes a series of measures and actions that are intended to reduce per capita GHG emissions by just over 65 percent below 1990 levels by 2030 (equivalent to 986,572 MT CO_2e in 2030). This reduction achieves Moreno Valley's 2030 target and exceeds the State's 2030 goal. This reduction also provides substantial progress toward meeting Moreno Valley's longer-term carbon-neutrality target by 2045. The Moreno Valley CAP acknowledges that additional measures and actions beyond those identified in the plan will be necessary to achieve the long-term target of carbon neutrality and, thus, provides a mechanism for monitoring progress and regularly updating and adopting CAP updates to incorporate new technologies that will further Moreno Valley toward meeting the long-term target of carbon neutrality.

As part of the Moreno Valley CAP process, the City has developed a set of strategies to reduce GHG emissions across various sectors to achieve the Moreno Valley 2030 GHG emissions reduction target and make substantial progress towards the Moreno Valley 2045 target. Each strategy is supported by a set of measures and actions that provide a measurable GHG emissions reduction that is supported by substantial evidence. The structure of the Sectors, Measures, and Actions is as follows:

- **Sector:** Overall GHG emissions category in which the GHG reduction will occur.
- **Measures:** Approach measurable through a discrete performance metric to reduce GHG emissions by a quantifiable level within a specific time period.
- **Actions:** Discrete steps Moreno Valley will take, supported by substantial evidence to achieve the performance metric of the overarching measure.

The Measures and Actions can be either quantitative or supportive, defined as follows:

- **Quantitative.** Quantitative measures and actions result in quantifiable GHG emissions reduction when implemented. GHG emissions reduction from these measures and actions are supported by case studies, scientific articles, calculations, or other third-party substantial evidence.
- **Supportive.** Supportive measures and actions may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction. However, due to one of several factors – including a low GHG emissions reduction effect, indirect GHG emissions reduction benefit, or potential for double-counting – such measures will not be quantified and do not contribute directly to the expected GHG emissions reduction target and consistency with the State goals. For example, municipal-specific measures are not quantified, as they represent a subset of communitywide emissions and as such could be characterized as double-counting. Despite not being quantified, supportive measures/actions are nevertheless critical to the overall success of the CAP and provide support so that the quantitative measures and actions will be successfully implemented.

Table 4 summarizes the per capita GHG emissions reduction that is anticipated to be achieved by 2030 by the identified measures and actions in the Moreno Valley CAP, in addition to State laws and programs. As shown therein, implementation of State laws and programs as well as the Moreno Valley CAP would achieve Moreno Valley's 2030 target of a 65 percent reduction in per capita 1990 GHG emission levels by 2030. Moreno Valley's GHG emissions reduction targets were set using per capita GHG emissions in accordance with guidance from California's 2017 Climate Change Scoping Plan (2017 Scoping Plan).[10] The 2017 Scoping Plan recommends jurisdictions use per capita GHG emissions when setting targets to avoid penalizing cities which are growing at significant rates. A per capita approach provides Moreno Valley with an emissions reduction pathway that is fair and scalable by pacing reduction efforts with the significant population and economic growth projected.[11] To provide consistency with the GHG threshold calculations presented in Chapter 5,

[10] California Air Resources Board (CARB). California's 2017 Climate Change Scoping Plan (2017), p. 99-102. Accessed January 2025 at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf.

[11] Moreno Valley's per capita GHG emissions reduction targets were also developed based on sector-specific, local GHG data that was translated to a per capita basis based on population. This target-setting methodology is consistent with the 2022 Scoping Plan which recommends that jurisdictions develop locally appropriate, plan-level targets.
California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality (2022). Accessed at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.

Utilizing Quantitative California Environmental Quality Act Greenhouse Gas Thresholds, the 1990 per capita GHG emissions baseline, per capita GHG emissions reductions, and remaining per capita GHG emissions presented within Table 3 are translated to mass GHG emissions. Table 4 shows the resulting mass GHG emissions reduction. As shown therein, implementation of State laws and programs as well as the Moreno Valley CAP would result in just over a 65 percent reduction below 1990 levels, equivalent to reducing GHG emissions to 986,572 MT CO_2e in 2030.

Table 3 Moreno Valley Per Capita GHG Emissions Reduction by 2030

Source	Annual Per Capita GHG Emissions (MT CO_2e/capita)
1990 Baseline GHG Emissions[1]	11.80
Business-as-Usual 2030 GHG Emissions	**7.38**
State Laws/Programs	(1.38)
CAP Building Energy Sector	(0.21)
CAP Transportation Sector	(0.84)
CAP Solid Waste Sector	(0.81)
CAP Carbon Sequestration Sector	(0.02)
Total GHG Emissions Reduction (from BAU)	**(3.27)**
Remaining 2030 GHG Emissions	**4.10**
Percent Reduction below 1990 Per Capita GHG Emissions	**(65%)**

( ) denotes a negative number. MT CO_2e = metric tons of carbon dioxide equivalent. GHG = greenhouse gas; CAP = Climate Action Plan; BAU = business-as-usual. Values may not add to the total due to rounding.

[1] 1990 GHG emissions were estimated by back-casting Moreno Valley's total 2019 GHG emissions based on the change in the State's GHG emissions between 2019 and 1990, excluding sectors that are not within Moreno Valley. It is assumed that the change in Moreno Valley's GHG emissions from 2019 to 1990 is equal to the State's change in GHG emissions of the same time period. 1990 GHG emissions for Moreno Valley were not estimated at the individual sector level.

Source: City of Moreno Valley. Moreno Valley CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets and Appendix D: Greenhouse Gas Emissions Reduction Technical Appendix (2025).

Table 4 Moreno Valley Mass GHG Emissions Reduction by 2030

Source	Annual Mass GHG Emissions (MT CO_2e)
1990 Baseline GHG Emissions[1]	1,401,312
Business-as-Usual 2030 GHG Emissions	**1,773,624**
State Laws/Programs	(332,937)
CAP Building Energy Sector	(50,976)
CAP Transportation Sector	(202,947)
CAP Solid Waste Sector	(195,661)
CAP Carbon Sequestration Sector	(4,530)
Total GHG Emissions Reduction (from BAU)	**(787,052)**
Remaining 2030 GHG Emissions	**986,572**

( ) denotes a negative number. MT CO_2e = metric tons of carbon dioxide equivalent. GHG = greenhouse gas; CAP = Climate Action Plan; BAU = business-as-usual. Values may not add to the total due to rounding.

[1] 1990 GHG emissions were estimated by back-casting Moreno Valley's total 2019 GHG emissions based on the change in the State's GHG emissions between 2019 and 1990, excluding sectors that are not within Moreno Valley. It is assumed that the change in Moreno Valley's GHG emissions from 2019 to 1990 is equal to the State's change in GHG emissions of the same time period. 1990 GHG emissions for Moreno Valley were not estimated at the individual sector level.

Source: City of Moreno Valley. Moreno Valley CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets and Appendix D: Greenhouse Gas Emissions Reduction Technical Appendix (2025).

2.3 Greenhouse Gas Emissions Forecast

Error! Reference source not found. Figure 1 and Table 5 summarize the communitywide GHG emissions forecast under three scenarios:

1) Business-as-usual (BAU),
2) Implementation of State laws and programs (or adjusted forecast), and
3) Implementation of State laws and programs and the Moreno Valley CAP.

As shown therein, under the BAU scenario, communitywide GHG emissions are forecasted to increase by approximately 97 percent between 2019 and 2045 based on economic and population growth. However, with implementation of State laws and programs, communitywide GHG emissions would increase by only about 29 percent between 2019 and 2045. Full implementation of the Moreno Valley CAP alongside State laws and programs would reduce communitywide GHG emissions by approximately 22 percent below 2019 levels by 2030 and by approximately 88 percent below 2019 levels by 2045.

Figure 1 Moreno Valley 2030 and 2045 Mass GHG Emissions Forecast

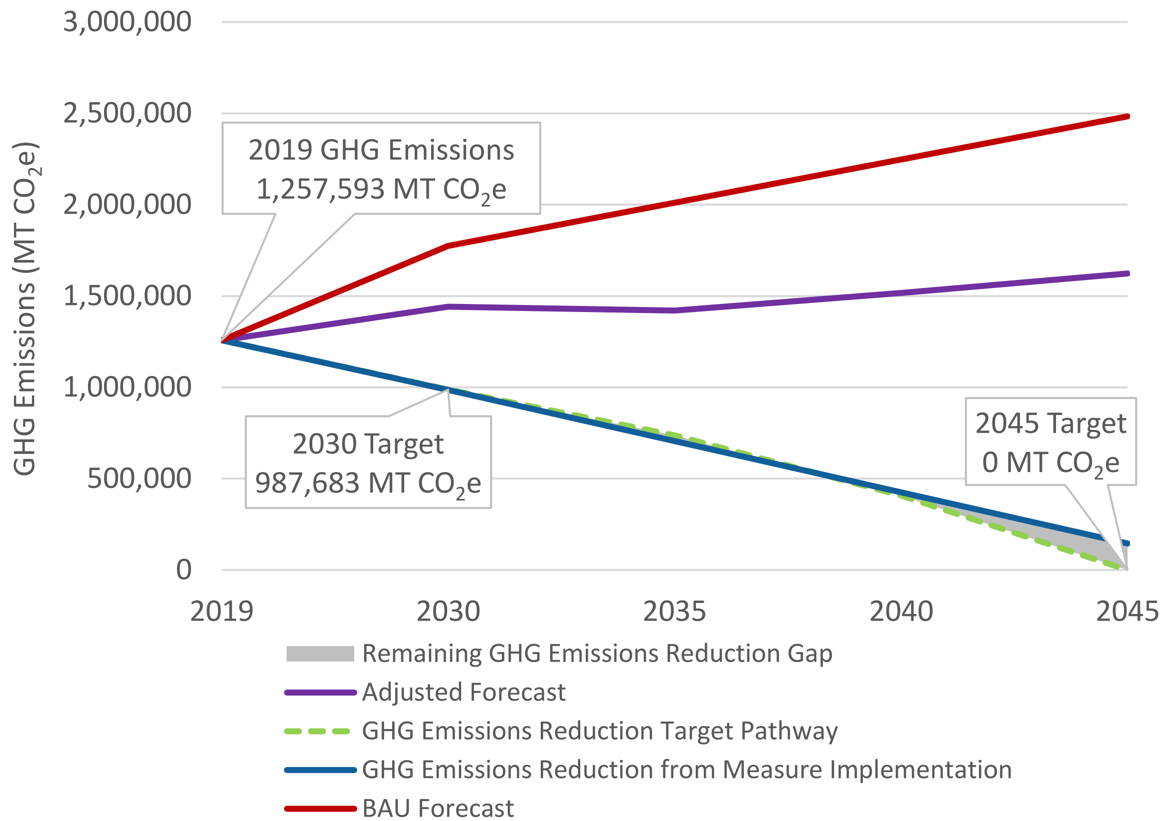

Table 5 Moreno Valley GHG Emissions Forecast Through 2045

Sector	2019 (MT CO_2e)	2030 (MT CO_2e)	2045 (MT CO_2e)
Business-as-Usual (BAU) GHG Emissions			
Building Electricity[1]	189,522	289,425	425,657
Building Natural Gas[2]	183,935	282,929	417,920
On-road Transportation	658,678	907,551	1,246,924
Off-road Equipment	56,673	58,354	66,736
Solid Waste	160,875	224,336	310,872
Water	7,020	9,789	13,565
Wastewater	889	1,240	1,718
Total	**1,257,593**	**1,773,624**	**2,483,392**
GHG Emissions After Implementation of State Laws/Programs (Adjusted Forecast)[3]			
Building Electricity[1]	189,522	151,602	0
Building Natural Gas[2]	183,935	277,374	404,791
On-road Transportation	658,678	722,093	839,372
Off-road Equipment	56,673	58,354	66,736
Solid Waste	160,875	224,336	310,872
Water	7,020	5,744	0
Wastewater	889	1,183	1,530
Total	**1,257,593**	**1,440,687**	**1,623,302**
GHG Emissions After Implementation of State Laws/Programs (Adjusted Forecast) and CAP Measures			
Building Electricity[1]	189,522	138,203	0
Building Natural Gas[2,4]	183,935	239,797	93,001
On-road Transportation	658,678	537,481	1,650
Off-road Equipment	56,673	40,019	27,818
Solid Waste	160,875	28,674	28,674
Water	7,020	5,744	0
Wastewater	889	1,183	1,530
Carbon Sequestration[5]	N/A	(4,530)	(7,512)
Total	**1,257,593**	**986,572**	**145,161**

( ) denotes a negative value. MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; N/A = not applicable. Values may not add to totals due to rounding.

[1] The Building Electricity GHG emissions sector includes residential and nonresidential consumption, as well as electricity transmission and distribution losses.

[2] The Building Natural Gas GHG emissions sector includes residential and nonresidential consumption, as well as methane leakage from pipelines and end-use leaks.

[3] State laws and programs include State vehicle fuel efficiency standards, the Renewable Portfolio Standard (RPS), and triennial updates of Title 24.

[4] The GHG emissions reduction from the CAP Measures in the Building Natural Gas sector includes the natural gas emissions reduction from Measure BE-2, Measure BE-3, Measure BE-4 and Measure BE-5 and are slightly offset by added emissions from these Measures' converted electricity in 2030.

[5] The 2019 GHG emissions inventory and emissions forecasts did not include emissions from carbon sequestration. The CAP Measures include the GHG emissions reduction from Measure CS-1's compost application and Measure CS-2's tree planting.

Sources: City of Moreno Valley. Moreno Valley CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets and Appendix D: Greenhouse Gas Emissions Reduction Technical Appendix (2025).

At this time, the State has codified a goal of reducing GHG emissions to 40 percent below 1990 emissions levels by 2030 (SB 32, 2016) and has developed the 2022 Climate Change Scoping Plan to demonstrate how the State will achieve the 2030 goal and make substantial progress toward the 2045 goal of carbon neutrality established by AB 1279 (2023).

While State and regional regulations related to energy and transportation systems, along with the State's Cap and Trade program, are designed to be set as limits to achieve most of the GHG emissions reduction needed to achieve the State's long-term goals, local governments can do their fair share toward meeting the State's goals by siting and approving projects that accommodate planned population growth and projects that are GHG-efficient. The Association of Environmental Professionals (AEP) Climate Change Committee recommends that CEQA GHG analyses evaluate project emissions in light of the trajectory of State climate change legislation and assess their "substantial progress" toward achieving long-term reduction targets identified in available plans and legislation.[12]

Moreno Valley has adopted a longer-term target of achieving carbon neutrality by 2045 and has proposed the Moreno Valley CAP as a pathway to make progress toward this target. Implementation of the Moreno Valley CAP would achieve an approximately 65 percent reduction in per capita GHG emissions below 1990 levels by 2030, exceeding SB 32 (2016)'s 2030 goal and making substantial progress toward AB 1279 (2023)'s 2045 carbon neutrality goal. Avoiding interference with, and making substantial progress toward, these long-term State goals is important because these goals have been set at levels that achieve California's fair share of international GHG emissions reduction targets that would stabilize global climate change effects and avoid the adverse environmental consequences described in Appendix A.

[12] Association of Environmental Professionals (AEP). Final White Paper. Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California (2016). Accessed at: https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf

3 Regulatory and Legal Setting

The following regulations, executive orders, and case law pertain to the analysis of GHG emissions consistent with CEQA and the CEQA Guidelines.

3.1 Relevant California Environmental Quality Act Guidelines Sections

Pursuant to the requirements of SB 97 (2007), the California Natural Resources Agency has adopted amendments to the CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted CEQA Guidelines, which were last updated in January 2025, provide general regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG emissions and climate change impacts.

Based on Appendix G of the CEQA Guidelines, impacts related to GHG emissions generated by a proposed plan/project would be significant if the plan/project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

The vast majority of individual projects do not generate sufficient GHG emissions to directly influence climate change. However, physical changes caused by a plan/project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a plan/project are limited. As discussed in Appendix A, the adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions and climate change are significant. Therefore, per CEQA Guidelines Section 15064.4(b), the analysis of GHG emissions under CEQA typically involves an analysis of whether a plan or project's contribution towards an impact would be cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines Section 15064[h][1]).

The following sections of the CEQA Guidelines pertain to the creation of significance thresholds and the analysis of a plan/project's GHG emissions.

CEQA Guidelines Section 15064(b)

(1) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

(2) Thresholds of significance, as defined in Section 15064.7(a), may assist lead agencies in determining whether a project may cause a significant impact. When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant. Compliance with the threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant.[13]

CEQA Guidelines Section 15064.4

(a) The determination of the significance of GHG emissions calls for careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to

  (3) Quantify GHG emissions resulting from a project; and/or

  (4) Rely on a qualitative analysis or performance-based standards.

(b) In determining the significance of a project's GHG emissions, the lead agency should focus the analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to Statewide, national, or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and State regulatory schemes. A lead agency should consider the following factors, among others, when determining the significance of impacts from GHG emissions on the environment:

  (5) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.

  (6) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

  (7) The extent to which the project complies with regulations or requirements adopted to implement a Statewide, regional, or local plan for the reduction or mitigation of GHG emissions (see, e.g., section 15183.5[b]). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and conclude that the project's incremental contribution is not cumulatively considerable.

(c) A lead agency may use a model or methodology to estimate GHG emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers

[13] Association of Environmental Professionals. 2025. 2025 CEQA Statute and Guidelines. https://www.califaep.org/docs/CEQA_Handbook_2025combined.pdf

most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support the selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.[14]

CEQA Guidelines Section 15064.7

(d) A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant.

(e) Each public agency is encouraged to develop and publish thresholds of significance that the agency uses in the determination of the significance of environmental effects. Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence. Lead agencies may also use thresholds on a case-by-case basis as provided in Section 15064(b)(2).

(f) When adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence.

(g) Using environmental standards as thresholds of significance promotes consistency in significance determinations and integrates environmental review with other environmental program planning and regulation. Any public agency may adopt or use an environmental standard as a threshold of significance. In adopting or using an environmental standard as a threshold of significance, a public agency shall explain how the particular requirements of that environmental standard reduce project impacts, including cumulative impacts, to a level that is less than significant, and why the environmental standard is relevant to the analysis of the project under consideration. For the purposes of this subdivision, an "environmental standard" is a rule of general application that is adopted by a public agency through a public review process and that is all the following:

(1) A quantitative, qualitative or performance requirement found in an ordinance, resolution, rule, regulation, order, plan or other environmental requirement;

(2) Adopted for the purpose of environmental protection;

(3) Addresses the environmental effect caused by the project; and,

(4) Applies to the project under review.[15]

CEQA Guidelines Section 15183.5

(h) Lead agencies may analyze and mitigate the significant effects of GHG emissions at a programmatic level, such as in a general plan, a long-range development plan, or a separate plan to reduce GHG emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of GHG emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs),

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[14] Ibid.

[15] Ibid.

15175–15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).

(i) Plans for the Reduction of GHG Emissions. Public agencies may choose to analyze and mitigate significant GHG emissions in a plan for the reduction of GHG emissions or similar documents. A plan to reduce GHG emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(5) Plan Elements. A plan for the reduction of GHG emissions should:

(A) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;

(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;

(F) Be adopted in a public process following environmental review.

(6) Use with Later Activities. A plan for the reduction of GHG emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a GHG reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project's compliance with the specified requirements in the plan for the reduction of GHG emissions, an EIR must be prepared for the project.

(j) Special Situations. As provided in Public Resources Code sections 21155.2 and 21159.28, environmental documents for certain residential and mixed use projects, and transit priority projects, as defined in section 21155, that are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in an applicable sustainable communities strategy or alternative planning strategy need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in GHG emissions resulting from other sources, however, consistent with these Guidelines.[16]

[16] Ibid.

CEQA Guidelines Section 15126.4(c)

Consistent with section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of GHG emissions. Measures to mitigate the significant effects of GHG emissions may include, among others:

(7) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

(8) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures, such as those described in Appendix F;

(9) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;

(10) Measures that sequester GHGs; and,

(11) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of GHG emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.[17]

3.2 Relevant State and Regional Greenhouse Gas Reduction Targets

Assembly Bill 32 (2006)

California's major initiative for reducing GHG emissions is outlined in AB 32 (2006), the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 (2006) codifies the State's goal of reducing Statewide GHG emissions to 1990 levels by 2020 and required the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines the main State strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 (2006) required CARB to adopt regulations to require reporting and verification of Statewide GHG emissions. Based on this guidance, CARB approved a 1990 Statewide GHG level and 2020 limit of 427 million metric tons (MMT) of CO_2e. The Scoping Plan was approved by CARB on December 11, 2008 and included measures to address GHG emissions reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since approval of the Scoping Plan.[18]

In May 2014, CARB approved the first update to the AB 32 Climate Change Scoping Plan. The 2013 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 Statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emissions reduction goals defined in the original Scoping Plan. It also evaluated how to align the State's longer-term GHG reduction strategies with

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[17] Ibid.

[18] CARB. 2008. *Climate Change Scoping Plan*. December 2008. https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

other State policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use. [19]

Senate Bill 32 (2016)

On September 8, 2016, the governor signed SB 32 (2016) into law, extending AB 32 (2006) by requiring the Statewide reduction of GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 (2006) remain unchanged). On December 14, 2017, CARB adopted the 2017 Scoping Plan, which provided a framework for achieving the 2030 target. The 2017 Scoping Plan relied on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently adopted programs and policies, such as SB 350 (2015) and SB 1383 (2016). The 2017 Scoping Plan also put an increased emphasis on innovation, adoption of existing technology, and strategic investment to support the strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan did not provide project-level thresholds for land use development. Instead, it recommended that local governments adopt policies and locally appropriate quantitative thresholds consistent with Statewide per capita goals. It also recommended the use of locally appropriate per capita GHG emissions reduction targets to account for population growth.[20] As stated in the 2017 Scoping Plan, the Statewide goals may be appropriate for plan-level analyses (city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the State.[21]

Senate Bill 375 (2008)

SB 375 (2008), signed in August 2008, enhanced the State's ability to reach AB 32 (2006) goals by directing CARB to develop regional GHG emissions reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 (2008) aligned regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO's Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as "transit priority projects" would receive incentives to streamline CEQA processing.

On March 22, 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. The Southern California Association of Governments (SCAG) was assigned targets of an eight percent reduction in GHGs from transportation sources by 2020 and a 19 percent reduction in GHGs from transportation sources by 2035. SCAG adopted Connect SoCal 2020 in September 2020, which is the region's RTP/SCS and meets the requirements of SB 375 (2008).[22]

Assembly Bill 1279 (2022)

AB 1279 (2022), signed in September 2022, builds upon Executive Order (EO) B-55-18 (2018), which originally established California's 2045 goal of carbon neutrality and tasked CARB with including a

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[19] CARB. 2014. *First Update to the Climate Change Scoping Plan*. May 15, 2014. https://ww3.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.

[20] The 2022 Scoping Plan continues to recommend that jurisdictions develop locally appropriate, plan-level targets. California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality (2022). Accessed at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.

[21] CARB. 2017. 2017 Climate Change Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf.

[22] Association of Bay Area Governments. October 2021. Plan Bay Area 2050. https://planbayarea.org/digital-library/plan-bay-area-2050

pathway toward the EO B-55-18 (2018) carbon neutrality goal in the 2022 Scoping Plan.[23] AB 1279 (2022) codified the Statewide carbon neutrality goal into a legally binding requirement for California to achieve carbon neutrality no later than 2045 and ensure 85 percent[24] GHG emissions reduction under that goal. This goal is in addition to the existing Statewide GHG emissions reduction goals established by SB 375 (2008), SB 32 (2016), and SB 1383 (2016).

Senate Bill 1020 (2022)

Established in 2002 under SB 1078 (2002), and accelerated by SB 107 (2006), SB X 1-2 (2011), SB 100 (2018), and SB 1020 (2022), California's Renewable Portfolio Standard (RPS) obligates investor-owned utilities, energy service providers, and community choice aggregators to transition the electricity supply to renewable resources. The RPS requires energy service providers to supply renewable energy as follows: 90 percent of retail sale electricity and 100 percent of electricity procured to serve State agencies by 2035, 95 percent by 2040, and 100 percent by 2045. The California Public Utilities Commission and the California Energy Commission are jointly responsible for implementing the program.

Senate Bill 1383 (2016)

Adopted in September 2016, SB 1383 (Lara, Chapter 395, Statutes of 2016) required CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 (2016) required the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 (2016) also required the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

3.3 Relevant Greenhouse Gas Emissions Analysis Case Law

Friends of Oroville v. City of Oroville, 219 Cal.App.4th 832 (2013)

The Third District Court of Appeal decision in the *Friends of Oroville v. City of Oroville* case was published on August 19, 2013. This decision evaluated the methodology used to analyze GHG emissions in an Environmental Impact Report (EIR) prepared for a Wal-Mart Supercenter development project that included replacing an existing Wal-Mart store with a Wal-Mart Supercenter in Oroville in Butte County. The EIR used consistency with the AB 32 (2006) emissions reduction goal as the significance threshold for evaluating the project's GHG emissions and compared the magnitude of the proposed project's emissions to Statewide 2004 emission levels as part of the analysis. The Court found that EIR applied "a meaningless, relative number to determine

[23] State of California, Executive Department. Executive Order B-55-18 to Achieve Carbon Neutrality (2018). Accessed at: https://archive.gov.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf.

[24] To achieve carbon neutrality, the remaining 15 percent of GHG emissions would be achieved through carbon capture and sequestration efforts.

insignificant impact" rather than evaluating the project's emissions considering the AB 32 (2006) emissions reduction goal. The Court also found that the EIR "misapplied the [AB] 32 threshold-of-significance standard by [1] failing to calculate the GHG emissions for the existing Wal-Mart and [2] failing to quantitatively or qualitatively ascertain or estimate the effect of the Project's mitigation measures on GHG emissions." The Court determined that the EIR could and should have performed these quantifications to adequately evaluate the project's GHG emissions using the AB 32 (2006) emissions reduction goal.

Sierra Club v. County of San Diego, 231 Cal.App.4th 1152 (2014)

The Fourth District Court of Appeal decision in the *Sierra Club v. County of San Diego* case was published on October 29, 2014. This decision evaluated the adequacy of the CAP prepared by the County of San Diego to satisfy Mitigation Measure CC-1.2 of the program EIR prepared for the 2011 General Plan. To reduce GHG emissions impacts of the 2011 General Plan to a less-than-significant level, Mitigation Measure CC-1.2 required the preparation of a CAP that would include "more detailed GHG emissions reduction targets and deadlines" and that would "achieve comprehensive and enforceable GHG emissions reduction of 17 percent (totaling 23,572 MT CO_2e) from County operations from 2006 by 2020 and nine percent reduction (totaling 479,717 MT CO_2e) in community emissions from 2006 by 2020." The Court found the CAP did not include enforceable and feasible GHG emissions reduction measures that would achieve the necessary emissions reduction; therefore, the CAP did not meet the requirements of Mitigation Measure CC-1.2 and would not ensure that the mitigation measure would reduce GHG emissions to a less-than-significant impact. In addition, the Court found that the County failed to evaluate the environmental impacts of the CAP and the associated thresholds of significance under CEQA.

Center for Biological Diversity v. California Department of Fish and Wildlife, 62 Cal.4th 214 (2015)

The California Supreme Court's decision in the *Center for Biological Diversity v. California Department of Fish and Wildlife* case was published on November 30, 2015. This decision evaluated the methodology used to analyze GHG emissions in an EIR prepared for the Newhall Ranch development project that included approximately 20,885 dwelling units with 58,000 residents on 12,000 acres of undeveloped land in Los Angeles County. The EIR used a business-as-usual approach to evaluate whether the project would be consistent with the AB 32 (2006) Scoping Plan. The Court found there was insufficient evidence in the record of that project to explain how a project that reduces GHG emissions by the same percentage as the business-as-usual reduction identified for the State to meet Statewide goals supported a conclusion that project-level impacts were below the level of significance.

The California Supreme Court suggested regulatory consistency as a pathway to compliance by stating that a lead agency might assess consistency with the State's GHG reduction goals by evaluating compliance with regulations designed to reduce GHG emissions. This approach is consistent with CEQA Guidelines Section 15064.4(b), which provides that determination of an impact is not cumulatively considerable to the extent to which the project complies with regulations or requirements implementing a Statewide, regional, or local plan to reduce or mitigate GHG emissions. The Court also found that a lead agency may rely on numerical and efficiency-based thresholds of significance for GHG emissions, if supported by substantial evidence.

Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego, 27 Cal.App.5th 892 (2018)

The Fourth District Court of Appeal decision in the *Golden Door Properties, LLC v. County of San Diego* case (published on September 28, 2018) evaluated the County of San Diego's 2016 Guidance Document's GHG efficiency metric, which establishes a generally applicable threshold of significance for proposed projects. The Court held that the County of San Diego is barred from using the 2016 Guidance Document's threshold of significance of 4.9 MT CO_2e per service person per year for GHG analysis. The Court stated that the document violated CEQA because it was not adopted formally by ordinance, rule, resolution, or regulation through a public review process per CEQA Guidelines Section 15064.7(b). The Court also found that the threshold was not supported by substantial evidence that adequately explained how a service population threshold derived from Statewide data could constitute an appropriate GHG metric to be used for all projects in unincorporated San Diego County. Nevertheless, lead agencies may make plan- or project-specific GHG emissions threshold determinations.

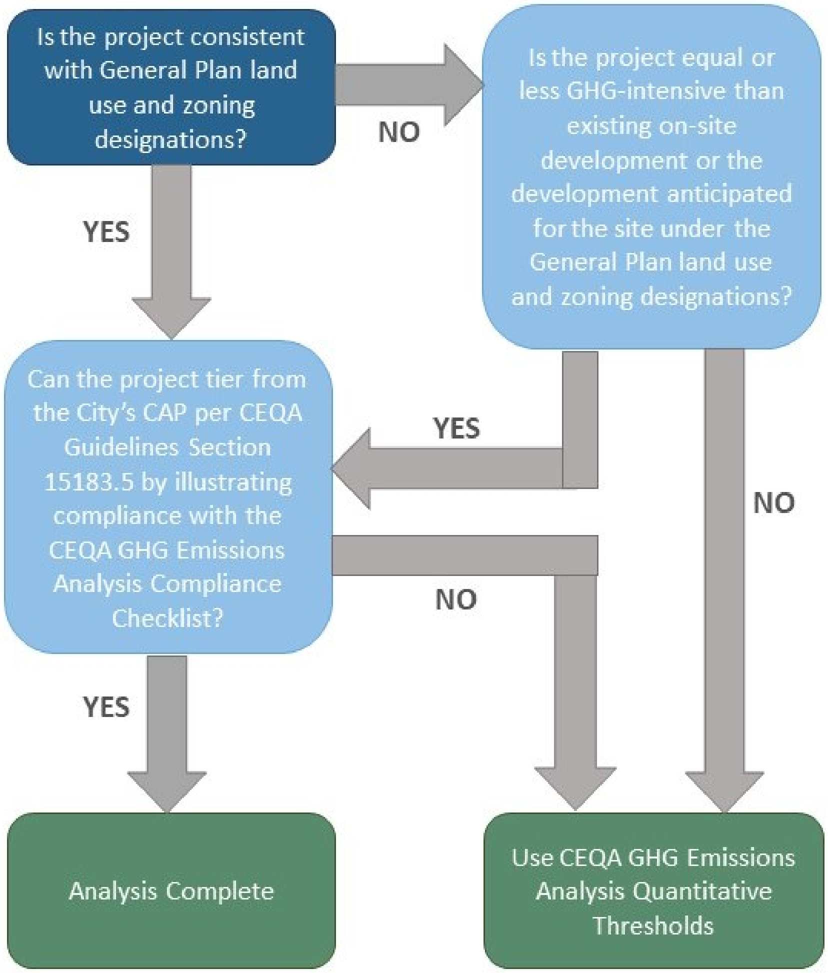
Tsakopoulos Investments, LLC v. County of Sacramento, 95 Cal.App.5th 280 (2023)

The California Court of Appeal upheld the County of Sacramento's approval of the Mather South Community Master Plan under CEQA. The plaintiff, Tsakopoulos Investments, LLC, challenged the adequacy of the project's EIR, particularly its climate change analysis. Tsakopoulos argued that the County's GHG significance thresholds were based on a methodology using a Statewide GHG emissions reduction target previously rejected by the California Supreme Court in *Center for Biological Diversity v. Department of Fish & Wildlife* and the Fourth District Court of Appeal in *Golden Door Properties, LLC v. County of San Diego*. However, the court found that Sacramento County's approach was distinguishable because it relied on local, sector-specific data and tailored analysis rather than broad Statewide targets. The court emphasized that CEQA allows lead agencies discretion in selecting significance thresholds, as long as the reasoning is supported by substantial evidence. The County's method—using an efficiency metric based on per capita emissions—was deemed legally adequate. Consequently, the appellate court affirmed the trial court's judgment, validating the EIR's climate change analysis and the project's approval.

4 Determining Consistency with the Moreno Valley Climate Action Plan

As discussed in Chapter 2, *Moreno Valley Climate Action Plan Summary*, upon public adoption of the Revised EIR and approval of the Moreno Valley CAP by City Council, the CAP will be a qualified GHG emissions reduction plan per the requirements of CEQA Guidelines Section 15183.5 for the year 2030. Therefore, the CAP can be utilized to streamline the CEQA GHG emissions analysis for plans and projects through 2030. Projects and plans that are consistent with the demographic projections and land use assumptions in the CAP can utilize the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist to demonstrate consistency with the CAP GHG emissions reduction strategy, and if consistent, can streamline the GHG analysis (i.e., conduct a qualitative analysis) utilizing the CEQA GHG Emissions Thresholds and Guidance Report and the environmental review in the Revised EIR. In doing so, these projects would result in less-than-significant GHG emissions and not result in a cumulatively considerable GHG emissions impact. The following process (see Figure 2) shows how to demonstrate a plan/project's consistency with the CAP GHG emissions reduction strategy and, thereby, streamline the CEQA GHG emissions analysis. This approach is consistent with the recommendations of the AEP Climate Change Committee for using qualified GHG reduction plans to demonstrate substantial progress toward meeting the next milestone Statewide planning reduction goal (i.e., a 40 percent reduction below 1990 levels by 2030 as set forth by SB 32, 2016).

Figure 2 Determining Consistency with the Moreno Valley CAP



Step 1: Consistency with Demographic Forecasts and Land Use Assumptions

The CAP utilizes the same demographic projections developed for the 2024 General Plan Update in the Revised EIR. The demographic projections reflect the 2024 General Plan Update buildout and are consistent with Moreno Valley's 6th Cycle (2021-2029) Housing Element Update Sites Inventory Assessment. The employment projections are based on the Western Riverside Council of Government's Riverside County Transportation Model (RIVCOM).[25]

If a plan/project is consistent with the 2024 General Plan Update land use and zoning designation(s) of the plan area/project site, then the plan/project is consistent with the demographic projections and land use assumptions of the CAP and can move on to Step 2. In this case, the plan/project's associated GHG emissions were accounted for in the GHG emissions forecasts included in the CAP and are within the scope of this plan's analysis of communitywide GHG emissions. Accordingly, the analysis of the plan/project's GHG emissions in the CEQA document should include a reference to the plan/project's consistency with 2024 General Plan Update land use and zoning designation(s) of the plan area/project site and should explain the aforementioned connection between the 2024

[25] City of Moreno Valley. Moreno Valley CAP, Appendix C: GHG Emissions Forecast and Reduction Targets (2025).

General Plan Update land use and zoning designation(s) and the GHG emissions forecasts in the CAP. Then, proceed to Step 2.

If a plan/project is not consistent with the 2024 General Plan Update land use and zoning designation(s) of the plan area/project site but would result in equivalent or fewer GHG emissions as compared to existing on-site development or the development anticipated for the site under the 2024 General Plan Update, then the plan/project would still be within the demographic projections and land use assumptions of the CAP and can move on to Step 2. To provide substantial evidence for this determination, GHG emissions generated under existing conditions/2024 General Plan Update buildout and the proposed project need to be quantified and included in the CEQA analysis. See Chapter 6, *Quantifying Greenhouse Gas Emissions*, for guidance on quantifying GHG emissions for existing conditions/2024 General Plan Update buildout and the proposed plan/project. In this case, the analysis of the plan's/project's GHG emissions in the CEQA document should include a quantitative comparison of the proposed plan's/project's GHG emissions and GHG emissions generated by existing on-site development or the development anticipated for the site under the 2024 General Plan Update. The analysis should clearly explain how the plan/project's emissions are equivalent to or less than those generated by existing on-site development or the development anticipated for the site under the 2024 General Plan Update. Then, proceed to Step 2.

If a plan/project is not consistent with the 2024 General Plan Update land use and zoning designation(s) of the plan area/project site and would result in either new development of undeveloped land or redevelopment with higher GHG emissions than existing on-site development or than the development anticipated for the site under the 2024 General Plan Update, the plan/project cannot use the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist to streamline CEQA GHG analysis. Instead, the plan/project's GHG emissions can be evaluated using the quantitative GHG thresholds described in Chapter 5, *Utilizing Quantitative California Environmental Quality Act Greenhouse Gas Thresholds*, to evaluate the significance of the plan/project's GHG emissions.

Step 2: Consistency with CEQA GHG Emissions Analysis Compliance Checklist

The City is preparing the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist for plans and projects to demonstrate that they are consistent with the measures and actions of the Moreno Valley CAP. A project applicant can utilize the checklist to show that the plan/project includes all applicable measures and actions of the CAP. Projects that use and are consistent with the checklist are not required to quantify the reduction from the measures and actions included in the checklist, because the reduction from applicable measures and actions has already been quantified at a programmatic level in the Moreno Valley CAP.

If a plan/project is consistent with the applicable measures and actions in the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist, then the plan/project can tier from the programmatic GHG emissions environmental review included in the Revised EIR for the Moreno Valley CAP pursuant to CEQA Guidelines Section 15183.5(b)(1).

A plan/project that is consistent with all applicable measures and actions of the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist would result in less-than-significant GHG emissions and would not result in a cumulatively considerable impact related to GHG emissions and climate change. In this case, the analysis of a plan or project's GHG emissions in the respective CEQA review document should include a summary of the plan/project's consistency with applicable measures and actions of the checklist and an explanation with substantial evidence of why any measures and actions in the checklist are not applicable to the plan/project.

5 Utilizing Quantitative California Environmental Quality Act Greenhouse Gas Thresholds

As discussed in Chapter 4, *Determining Consistency with the Moreno Valley Climate Action Plan,* if a plan/project is not consistent with the 2024 General Plan Update land use and zoning designation(s) of the plan area/project site, then a plan/project cannot use the Moreno Valley CEQA GHG Emissions Analysis Compliance Checklist to tier from the adopted CEQA GHG Emissions Thresholds and Guidance Report for the Moreno Valley CAP. Instead, the significance of a plan/project's GHG emissions can be evaluated using quantitative GHG thresholds derived from the assumptions of the Moreno Valley CAP. If a plan's/project's emissions are at or below the applicable threshold, a plan/project can tier from the existing programmatic environmental review contained in the adopted CEQA GHG Emissions Thresholds and Guidance Report for the Moreno Valley CAP if it is approved before the end of 2030. In doing so, such a plan/project would result in less-than-significant GHG emissions and would not result in a cumulatively considerable impact related to GHG emissions and climate change. For a plan's/project's post-2030, emissions at or below the thresholds for 2045 that equate to net zero MT CO_2e per year would be considered less-than-significant, and such a plans/project would not result in a cumulatively considerable GHG emissions impact. The following sections provide an explanation of the methodology used to calculate the thresholds, guidance on how to utilize the thresholds, and justification for use of these thresholds.

5.1 Greenhouse Gas Threshold Calculation Methodology

CEQA Guidelines Section 15064.4 does not establish a specific quantitative threshold of significance for evaluating GHG emissions associated with a proposed plan or project. Lead agencies have the discretion to establish significance thresholds for their respective jurisdictions. In establishing those thresholds, a lead agency may appropriately look to thresholds developed by other public agencies, or suggested by other experts, as long as the threshold chosen is supported by substantial evidence (CEQA Guidelines Section 15064.7[c]). The following methodology is consistent with guidance provided by the AEP Climate Change Committee in 2016 for establishing GHG emissions efficiency thresholds using the local jurisdictional GHG inventory and demographic forecasts.[26]

An efficiency threshold is a threshold expressed as a per-person metric (e.g., per resident, per employee, or per service person). Efficiency thresholds are calculated by dividing the allowable GHG emissions inventory in a selected calendar year by the resident, employee, or service population in that year. The efficiency threshold identifies the quantity of GHG emissions that can be generated on a per-person basis without significantly impacting the environment.

Locally appropriate, plan- and project-specific GHG emissions efficiency thresholds were derived from the GHG emissions forecasts calculated for the Moreno Valley CAP. These thresholds were created to comply with CEQA and the CEQA Guidelines and interpretive GHG emissions analysis case

[26] AEP. 2016. Final White Paper Beyond 2020 and Newhall: A Field Guide to New CEQA Greenhouse Gas Thresholds and Climate Action Plan Targets for California. https://califaep.org/docs/AEP-2016_Final_White_Paper.pdf.

law, which are summarized in Chapter 3, *Regulatory and Legal Setting*. The Moreno Valley GHG emissions efficiency thresholds were calculated using the GHG emissions forecasts with all GHG emissions sectors included, because plans and projects would generate vehicle and transit trips, consume energy and water, and produce wastewater and solid waste, thereby generating emissions in all categories. Efficiency thresholds were calculated for the year 2030 to provide GHG emissions thresholds for new development in line with the State's next milestone goal, which is for the year 2030.

GHG emissions efficiency thresholds would be used during the CEQA review process for new residential, nonresidential, and mixed-use plans and projects. Therefore, forecasted GHG emissions in the Moreno Valley CAP were disaggregated into existing development (i.e., development that took place through the GHG inventory year, 2019) and new development (i.e., development that has or will take place from 2019 through the threshold year) for each threshold year. Furthermore, forecasted GHG emissions for new development were further disaggregated into residential and nonresidential development for each threshold year for the purpose of calculating thresholds specific to new residential, nonresidential, and mixed-use projects. The results of the disaggregation of the GHG emissions forecast are presented in Figure 3 and Table 6, which summarizes the total amount of GHG emissions expected to be generated by existing, new residential, and new nonresidential development for threshold year 2030.

Figure 3 Allowable GHG Emissions from Existing and New Development in 2030

Table 6 Allowable GHG Emissions for 2030 by Type of Development (MT CO_2e)

Source	2030		
	Existing Development	New Development	
		Residential	Nonresidential
Business-as-Usual 2030 GHG Emissions	1,257,593	309,092	206,939
State Laws/Programs	(201,882)	(81,264)	(49,791)
CAP Building Energy Measures	(22,194)	(20,812)	(7,969)
CAP Transportation Measures	(144,697)	(37,240)	(21,010)
CAP Solid Waste Measures	(140,313)	(38,975)	(16,373)
CAP Carbon Sequestration Measures	(3,249)	(902)	(379)
CAP-Adjusted GHG Emissions	**745,259**	**129,898**	**111,416**

( ) denotes a negative value. Values may not add up to totals due to rounding. All values are expressed in metric tons of carbon dioxide equivalent (MT CO_2e). GHG = greenhouse gas; CAP = Climate Action Plan.

See Appendix B for calculations.

Source: City of Moreno Valley. Moreno Valley CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets and Appendix D: Greenhouse Gas Emissions Reduction Technical Appendix (2025).

Table 7 summarizes the demographic projections for Moreno Valley that were used in calculating GHG efficiency thresholds for year 2030. As shown in Table 6, the numbers of residents, employees, and service persons are all anticipated to increase between 2019 and 2030.

Table 7 Moreno Valley Demographic Projections

Metric	2019 Estimate	2030 Forecast	Net Increase from New Development (2019-2030)
Residents	176,614	240,428	63,814
Employees	53,118	79,925	26,808
Service Population[1]	229,731	320,353	90,621

[1] The service population is equal to the residential population plus the number of employees. Values may not add up to totals due to rounding.

Source: City of Moreno Valley. Moreno Valley CAP, Appendix C: Greenhouse Gas Emissions Forecasts and Reduction Targets (2025).

Table 8 shows how the remaining emissions for new development after implementation of the CAP measures are used with the demographic projections from Table 7 to create communitywide GHG emissions thresholds for 2030. The resulting GHG thresholds and allowable emissions are specified in Table 8.

Table 8 Moreno Valley 2030 CAP-Adjusted Emissions and Communitywide GHG Thresholds

	2030 (New Development)		
	Residential	Nonresidential	Mixed-Use
CAP-Adjusted 2030 GHG Emissions ($MT\ CO_2e$ per year)[1]	129,898	111,416	241,314
Demographic Metric[2]	63,814 new residents	26,808 new employees	90,621 new service people
GHG Efficiency Threshold ($MT\ CO_2e$ per year)	2.04 per resident	4.16 per employee	2.66 per service person

$MT\ CO_2e$ = metric tons of carbon dioxide equivalent; CAP = Climate Action Plan; GHG = greenhouse gas.

[1] See Table 6.

[2] Demographic estimates are for new plans or projects only and were calculated using the projections in Table 7.

5.2 Greenhouse Gas Thresholds and Use

The GHG efficiency thresholds for residential, nonresidential, and mixed-use projects built prior to December 31, 2030 are presented in Figure 4 and Table 9. If a plan's or project's GHG emissions do not exceed the applicable threshold, then it is considered consistent with the Moreno Valley CAP and the GHG emissions impacts (both project- and cumulative-level) would not result in a cumulatively considerable impact related to GHG emissions and climate change and would, therefore, be less than significant. If a plan's or project's emissions exceed the applicable threshold, then mitigation measures must be identified and respective GHG emissions reduction calculations included within the respective CEQA review document to reduce plan or project GHG emissions to or below the applicable threshold level. These thresholds are applicable to the following plan and project types proposed in Moreno Valley:

- **Residential.** Single-family dwellings, multi-family dwellings, boarding house, caretaker quarters, fraternities and sororities, high-occupancy residential uses, continuing care communities, mobile-home parks, residential care facilities, supportive and/or transitional housing, or any combination of these uses.
- **Nonresidential.** All commercial uses (including office and retail uses), all lodging uses, all public and quasi-public uses, elderly and long-term care, hospice in-patient facilities, family day cares, residential care facilities, supportive and/or transitional housing, sports and entertainment assembly facilities, all industry, manufacturing and processing, and wholesaling uses that are not subject to South Coast Air Quality Management District (AQMD) stationary source permitting or the State's Cap-and-Trade program, or any combination of these uses.
- **Mixed-use.** A combination of at least one residential and at least one nonresidential land use specified above.

Figure 4 Moreno Valley GHG Efficiency Thresholds

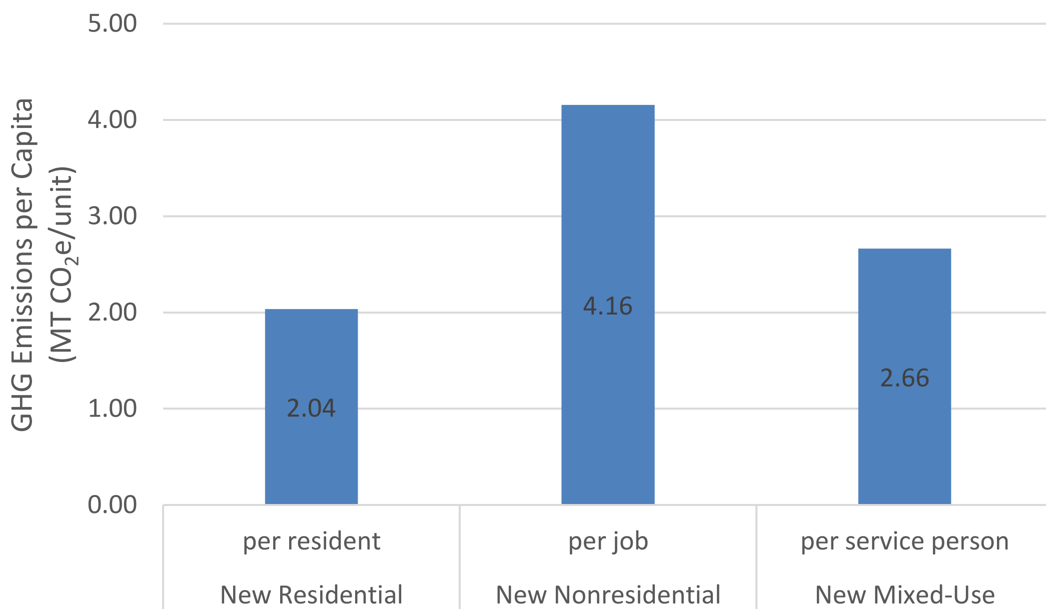


Table 9 Moreno Valley Locally Applicable Plan/Project CEQA GHG Emissions Thresholds

	2030 (New Development)		
	Residential	Nonresidential	Mixed-Use
GHG Efficiency Threshold ($MT\ CO_2e$ per year)	2.04 per resident	4.16 per full-time equivalent employee	2.66 per service person

$MT\ CO_2e$ = metric tons of carbon dioxide equivalent; GHG = greenhouse gas.

See Table 8 for the calculation methodology of the thresholds.

5.3 Justification for Greenhouse Gas Thresholds

Per CEQA Guidelines Section 15064(b)(1), "the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data." In addition, CEQA Guidelines Section 15064(b)(2) states, "When using a threshold, the lead agency should briefly explain how compliance with the threshold means that the project's impacts are less than significant." Furthermore, CEQA Guidelines Section 15064.7(b) states "Thresholds of significance to be adopted for general use as part of the lead agency's environmental review process must be adopted by ordinance, resolution, rule, or regulation, and developed through a public review process and be supported by substantial evidence." Therefore, the key considerations when developing thresholds of significance are:

1) The thresholds' basis on scientific and factual data;
2) Demonstration of how compliance with the thresholds reduces project impacts to a less-than-significant level;
3) Support of the thresholds by substantial evidence; and
4) Adoption of the thresholds by ordinance, resolution, rule, or regulation, and developed through a public review process.

The following subsections address these four key considerations.

Basis of Scientific and Factual Data

As discussed in Section 5.1, *Greenhouse Gas Threshold* Calculation Methodology, the quantitative thresholds were developed using data from the Moreno Valley 2019 communitywide GHG inventory and the GHG emissions forecasts for year 2030. These inventory and forecasts were developed by the City in compliance with all relevant protocols and guidance documents, including the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions,[27] Local Government Operations Protocol,[28] the Global Protocol for Community Scale GHG Emissions,[29] and the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories.[30] Furthermore, the inventory and forecasts are based on locally appropriate data for Moreno Valley provided by Moreno Valley Electric Utility (MVU), Southern California Edison (SCE), Southern California Gas Company, California Department of Resources Recycling and Recovery (CalRecycle), CARB, Eastern Municipal Water District, Edgemont Community Services District, Moreno Valley Regional Water Reclamation Facility, and Box Springs Mutual Water Company.[31] Therefore, both the emission inventory and forecast data underlying the thresholds are scientific and factual.

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[27] ICLEI. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Accessed at: https://icleiusa.org/us-community-protocol/

[28] California Air Resources Board (CARB). Local Government Operations Protocol for the quantification and reporting of greenhouse gas emissions inventories (2010). Accessed at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/protocols/lgo_protocol_v1_1_2010-05-03.pdf

[29] Greenhouse Gas Protocol. Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (2017). Accessed at: https://ghgprotocol.org/sites/default/files/ghgp/standards/GHGP_GPC_0.pdf

[30] Intergovernmental Panel on Climate Change (IPCC). 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (2019). Accessed at: https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

[31] City of Moreno Valley. Moreno Valley CAP, Appendix B: 2019 Greenhouse Gas Emissions Inventory (2025).

As discussed in Section 2.3, *Greenhouse Gas Emissions Forecast*, implementation of the Moreno Valley CAP would achieve a 65 percent reduction below 1990 per capita emissions levels by 2030. Therefore, this local target is more stringent than the State's goal of a 40 percent emissions reduction in 1990 levels by 2030 and makes substantial progress toward achieving the State's long-term goal of carbon neutrality by 2045. The quantitative thresholds are tied directly to the level of GHG emissions anticipated for new development in the Moreno Valley CAP for year 2030. Because the Moreno Valley CAP is consistent with the State's 2030 GHG emission goal, the quantitative thresholds are also consistent with the next State milestone GHG emissions reduction goal for 2030. The State's GHG emissions reduction goals for 2030 and 2045 are set at the levels scientists say are necessary to meet the Paris Agreement goals to reduce GHG emissions and limit global temperature rise below two degrees Celsius by 2100 to avoid dangerous climate change (AB 1279, 2023).[32] Therefore, the Moreno Valley GHG emissions reduction targets that inform the Moreno Valley CAP and the associated quantitative thresholds are based on scientific and factual data on the level of emissions reduction necessary to ensure Moreno Valley does not have a cumulatively considerable contribution to the cumulative impact of climate change.

Reduction of Plan or Project Impacts to a Less-than-Significant Level

As shown in Table 6 in Section 5.1, *Greenhouse Gas Threshold* Calculation Methodology, implementation of the Moreno Valley CAP would reduce annual per capita GHG emissions levels by 65 percent below 1990 levels by 2030.[33] The quantitative thresholds are tied directly to the level of GHG emissions anticipated for new development in Moreno Valley for year 2030. Therefore, the thresholds are consistent with Moreno Valley's local GHG emissions reduction target, which is consistent with the State's GHG emissions reduction goals. As mentioned in the preceding subsection, the State's GHG emissions reduction goals for 2030 and 2045 are set at the levels scientists say are necessary to meet the Paris Agreement goals to reduce GHG emissions and limit global temperature rise below two degrees Celsius by 2100 in order to avoid dangerous climate change (AB 1279, 2023).[34] Therefore, the quantitative thresholds are set at the level necessary to ensure Moreno Valley does not have a cumulatively considerable contribution to the cumulative impact of climate change. As a result, plans and projects with GHG emissions at or below the quantitative thresholds would also not have a cumulatively considerable contribution to the cumulative impacts of climate change, and plan/project impacts would be less than significant.

Support of Substantial Evidence

Substantial evidence regarding the calculation of the quantitative GHG emissions thresholds is provided in Section 5.1, *Greenhouse Gas Threshold* Calculation Methodology. The following subsections provide additional evidence of how the GHG emissions thresholds are locally appropriate and plan- or project-specific and how the GHG thresholds distinguish between existing and new development.

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32 California Air Resources Board. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

33 Moreno Valley's per capita GHG emissions reduction targets have been developed based on sector-specific, local GHG data that was translated to a per capita basis based on population. This target-setting methodology is consistent with the 2022 Scoping Plan which recommends that jurisdictions develop locally appropriate, plan-level targets.
California Air Resources Board. 2022 Scoping Plan for Achieving Carbon Neutrality (2022). Accessed at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.

34 California Air Resources Board. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

Use of Local Data

The quantitative thresholds were developed using the Moreno Valley communitywide GHG emissions forecast for the year 2030 and are, thus, specific to the City of Moreno Valley. The thresholds are directly tied to the population and job growth projected for Moreno Valley based on the 2024 General Plan Update, which aligns with Moreno Valley's 6th Cycle (2021-2029) Housing Element Update Sites Inventory Assessment as well as to the City-specific GHG emissions reduction strategies, measures, and actions that the City has proposed through the CAP to reduce communitywide GHG emissions. In addition, the magnitude of local GHG emissions reduction achieved by State legislation/policies (i.e., vehicle fuel efficiency standards, the RPS, and Title 24) was estimated based on City-specific growth, vehicle miles traveled (VMT), and off-road equipment fuel usage forecasts. As a result, these locally appropriate thresholds directly address the concerns raised in the *Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego* (2018) case, because they are based on local GHG emissions data rather than Statewide GHG emissions data.

Disaggregation of Existing versus New Development

The quantitative thresholds were developed by disaggregating Moreno Valley's BAU GHG emissions forecasts for year 2030 into GHG emissions forecasts for existing and new development, which are shown in Table 6 in Section 5.1, *Greenhouse Gas Threshold* Calculation Methodology. The GHG emissions reduction specific to new development achieved by State legislation/policies and the Moreno Valley CAP were then subtracted from the BAU scenario forecast to determine GHG emissions "caps" for new residential and new nonresidential development for year 2030. These "caps" were then divided by the numbers of residents, employees, and service persons forecasted for new development to determine efficiency thresholds for residential, nonresidential, and mixed-use development, respectively. As a result, these thresholds directly address the concerns raised in the *Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) case regarding the different rates of GHG emissions reduction anticipated for new development as compared to existing development to meet the specified GHG emissions reduction target.

Selection of Sector-Specific Thresholds

The quantitative GHG thresholds are separated into three categories–residential, nonresidential, and mixed-use–which are intended to apply to the three main types of development projects in Moreno Valley. These thresholds were calculated by disaggregating Moreno Valley's BAU GHG emissions forecast for new development in year 2030 into GHG emissions forecasts for new residential and new nonresidential development, which are shown in Table 6 in Section 5.1, *Greenhouse Gas Threshold* Calculation Methodology. The GHG emissions reduction specific to new residential and new nonresidential development achieved by State legislation/policies and the Moreno Valley CAP were then subtracted from the BAU forecast to determine "caps" of GHG emissions for new residential and new nonresidential development for year 2030. These GHG emissions "caps" were then divided by the numbers of residents and employees forecast for new development in year 2030 to determine efficiency thresholds for residential and nonresidential projects, respectively. For mixed-use development, the residential and nonresidential GHG emissions "caps" were summed, then divided by the service population forecast for new development in year 2030 to determine an efficiency threshold for mixed-use projects. As a result, these project-specific thresholds directly address the concerns raised in the *Center for Biological Diversity v. California Department of Fish and Wildlife* (2015) case, because they are specific to each development project type.

Adoption via Public Review Process

In compliance with CEQA Guidelines Section 15064.7(b), this guidance document and the quantitative thresholds contained herein will be presented to the City Planning Commission and then the City Council for formal adoption through a public review process, which will include an opportunity for public input. The public review process for the CEQA GHG Emissions Thresholds and Guidance Report will specifically occur via public review of and comment on the Revised EIR. The opportunity for public comment will also be available at a public hearing (i.e., Planning Commission and City Council meetings) considering adoption of the Moreno Valley CAP and CEQA GHG Emissions Thresholds and Guidance Report. This process directly addresses the concerns raised in the *Golden Door Properties, LLC v. County of San Diego/Sierra Club, LLC v. County of San Diego* (2018) case regarding formal adoption of new CEQA thresholds and how lead agencies should afford the opportunity for public review and input prior to adoption and use.

6 Quantifying Greenhouse Gas Emissions

There are a variety of analytical tools available to estimate project-level GHG emissions, including the California Emissions Estimator Model (CalEEMod),[35] which is a free, publicly available computer model developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with various air quality districts throughout the State. Alternative tools may be used to quantify emissions if they can be substantiated. In general, the most current version of CalEEMod should be used to calculate total emissions for discretionary development projects. The analysis should focus on carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), because these are the GHGs that most development projects generate in the largest quantities. Fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides, should also be considered for the analysis. Emissions of all GHGs should be converted into their equivalent global warming potential in terms of CO_2 (CO_2e). Calculations should be based on the current methodologies recommended by CAPCOA.[36]

6.1 Construction Greenhouse Gas Emissions

Construction activities emit GHGs primarily through combustion of fuels (mostly diesel) in the engines of off-road construction equipment and in on-road construction vehicles and in the commute vehicles of the construction workers. Smaller amounts of GHGs are emitted indirectly through the energy required for water used for fugitive dust control and lighting for the construction activity. Every phase of the construction process, including demolition, grading, paving, and building, emits GHG emissions in volumes proportional to the quantity and type of construction equipment used. Heavier equipment typically emits more GHGs per hour than lighter equipment because of the engine design and greater fuel consumption.

Construction emissions occur for a limited period of a project's lifetime. As a standard practice, GHG emissions from construction are amortized over a presumed project lifetime. South Coast AQMD recommends that GHG emissions from construction are amortized over the lifetime of a project, which is 30 years for typical development projects based on South Coast AQMD guidance.[37] CalEEMod generates a default construction schedule and equipment list based on the plan-/project-specific information, including land use type, project size, location, and construction timeline.[38] In general, if specific applicant-provided information is unknown, the default construction equipment list and phase lengths are the most appropriate inputs. However, if more detailed site-specific

[35] The most current available version of CalEEMod should be used. As of April 2025, CalEEMod version 2022.1 is the most current version and should be used to quantify project-level emissions.

[36] South Coast AQMD recommends using CAPCOA methodology, as detailed here: https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/greenhouse-gases
California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures. Accessed at: https://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoa-quantifying-greenhouse-gas-mitigation-measures.pdf

[37] South Coast AQMD. 2008. Interim CEQA GHG Significance Threshold for Stationary Sources, Rules, and Plans. https://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/ghgboardsynopsis.pdf?sfvrsn=832cf961_2

[38] CAPCOA. 2022. California Emissions Estimator Model User Guide: Version 2022.1. https://www.caleemod.com/documents/user-guide/01_User%20Guide.pdf

equipment and phase information (i.e., data from the project applicant) is available, the model's default values can (and should) be overridden.[39]

6.2 Operational Greenhouse Gas Emissions

CalEEMod estimates operational emissions of CO_2, N_2O, and CH_4 generated by area sources, energy use, vehicle trips (i.e., mobile sources), waste generation, and water use and conveyance. Operational emissions should be calculated for the year 2030, rather than the plan/project buildout year, in order to provide an appropriate comparison of project emissions to the year 2030 threshold.

Area Source Greenhouse Gas Emissions

Area sources include GHG emissions that would occur from the use of landscaping equipment, hearths, and woodstoves that emit GHGs associated with the equipment's fuel combustion. The landscaping equipment emission values in CalEEMod are derived from CARB's Small Off-Road Engines Model v1.1 (SORE2020).[40] Emission rates for combustion of wood and natural gas for wood stoves and fireplaces are based on those published by the U.S. EPA. Typically, no adjustments to landscaping equipment inputs are necessary. The number of hearths and woodstoves should be adjusted in CalEEMod to reflect the project design.[41]

Energy Use Greenhouse Gas Emissions

GHGs are emitted on-site during the combustion of natural gas for cooking, space and water heating, and decorative uses and off-site during the generation of electricity from fossil fuels in power plants. CalEEMod estimates GHG emissions from energy use by multiplying average rates of residential and nonresidential energy consumption by the quantities of residential units and nonresidential square footage entered in the land use module to obtain total projected energy use. This value is then multiplied by electricity and natural gas GHG emission factors applicable to the plan/project location and utility provider. Building energy use is typically divided into energy consumed by the built environment and energy consumed by uses that are independent of the building, such as plug-in appliances. Non-building energy use, or "plug-in energy use," can be further subdivided by specific end-use (refrigeration, cooking, office equipment, etc.). In California, Title 24 governs energy consumed by the built environment, mechanical systems, and some types of fixed lighting.

Electricity emissions are calculated by multiplying the energy use by the carbon intensity of the utility district per kilowatt hour.[42] Projects would generally be served by MVU or SCE. The specific energy intensity factors (i.e., the amount of CO_2, CH_4, and N_2O per kilowatt-hour) for the applicable utility should be used in the calculations of GHG emissions.

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39 *Ibid.*

40 Ibid.

41 South Coast AQMD requires all permanent fireplace and stove installations in new residential and commercial development be gaseous- or liquid-fueled.
South Coast AQMD. Rule 445 – Wood Burning Devices Local Government, Builder, Contractor, Architect
Answers to Frequently Asked Questions (FAQs) (2019). Accessed at: https://www.aqmd.gov/docs/default-source/rule-book/support-documents/rule-445/detailed-rule-445-information.pdf.

42 Ibid.

As of publication of this guidance document, the currently implemented iteration of Title 24 includes the 2022 Building Energy Efficiency Standards.[43] In accordance with Section 150.1(b)14 of the 2022 Building Energy Efficiency Standards, all new residential uses three stories or less must install photovoltaic (PV) solar panels that generate an amount of electricity equal to the expected electricity usage. The calculation method contained in Section 150.1(b)14 of the California 2022 Building Energy Efficiency Standards should be utilized to estimate the number of kilowatts of PV solar panels that would be required for a residential project three stories or less. In addition, modeling should account for local regulations pertaining to mandatory solar provisions. Online resources can be used to determine the kilowatt-hours that would be generated per year by the required solar PV system.[44] The energy reduction achieved by on-site PV solar panels should be included in CalEEMod. Future updates to Title 24 as they relate to the Building Energy Efficiency Standards, such as the upcoming 2025 Building Energy Efficiency Standards, should be incorporated into CalEEMod as applicable.

Mobile Source Greenhouse Gas Emissions

CalEEMod quantifies mobile source emissions generated by vehicle trips associated with the proposed plan/project. If available, plan/project-specific trip generation rates or VMT data should be input in CalEEMod.

Water and Wastewater Greenhouse Gas Emissions

The amount of water used, and the amount of wastewater generated by a plan/project generate indirect GHG emissions. These emissions are a result of the energy used to supply, convey, and treat water and wastewater. In addition to the indirect GHG emissions associated with energy use, the wastewater treatment process can directly emit both CH_4 and N_2O.

CalEEMod calculates indoor residential water consumption based on per capita daily water use rates from the Residential End Uses of Water published by the Water Research Foundation in 2016.[45] For nonresidential land uses, indoor water use comes from the Pacific Institute's (2003) *Waste Not, Want Not: The Potential for Urban Water Conservation in California*.[46] Outdoor water use is based on the Maximum Applied Water Allowance Method established under the Model Water Efficient Landscape Ordinance.[47] Wastewater generation is based on a reported percentage of total indoor water use.

Future updates to Title 24 as they relate to CALGreen water efficiency requirements, such as the 2025 CALGreen standards that will take effect in January 2026, should be incorporated into CalEEMod as applicable.

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43 The 2025 Building Energy Efficiency Standards will take effect on January 1, 2026.

44 Lane, Catherine. 2025." How much electricity does a solar panel produce?" Last updated: March 2025. https://www.solarpowerrocks.com/solar-basics/how-much-electricity-does-a-solar-panel-produce/.

45 The Water Research Foundation. 2016. Residential End Uses of Water, Version 2. Accessed at: https://www.waterrf.org/research/projects/residential-end-uses-water-version-2

46 CAPCOA. 2022. California Emissions Estimator Model User Guide: Version 2022.1. Prepared by ICF in collaboration with Sacramento Metropolitan Air Quality Management District, Fehr & Peers, STI, and Ramboll. http://www.aqmd.gov/caleemod/user's-guide.

47 California Department of Water Resources. Model Water Efficient Landscape Ordinance. Accessed at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Model-Water-Efficient-Landscape-Ordinance

Solid Waste Greenhouse Gas Emissions

The disposal of solid waste produces GHG emissions from the transportation of waste, anaerobic decomposition in landfills, and incineration. To calculate the GHG emissions generated by solid waste disposal, the total volume of solid waste is calculated using waste disposal rates identified by CalRecycle. The methods for quantifying GHG emissions from solid waste are based on the IPCC method, using the degradable organic content of waste. Users should contact the City to obtain the City's most recent solid rate diversion rate (if available) to be included in the calculation of solid waste GHG emissions.

Plan or Project Design Features

CEQA GHG emissions analysis preparers should use the "Mitigation" tabs to include project design features applicable to the plan/project.[48] These features often include increased density, improved destination accessibility, proximity to transit, integration of below market rate housing, unbundling of parking costs, provision of transit subsidies, implementation of alternative work schedules, use of energy- and/or water-efficient appliances, use of reclaimed and/or grey water, and installation of water-efficient irrigation system. Such preparers should also consider the applicability of these features to the plan/project and review the CAPCOA *Quantifying Greenhouse Gas Mitigation Measures* (2010) publication to ensure that the chosen features are relevant and feasible in light of the plan/project.[49]

Residents, Employees, and Service Populations

The quantitative thresholds presented in Chapter 5, *Utilizing Quantitative California Environmental Quality Act Greenhouse Gas Thresholds*, are expressed in terms of per resident for residential projects, per employee for nonresidential projects, and per service person for mixed-use projects. Estimates of the resident, employee, or service population for a plan/project should be based on substantial evidence. Data provided by the applicant as well as the following resources may be utilized in estimating resident and employee populations:

- **Person per Household.** The California Department of Finance website (https://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-5/) should be referenced for the most recent estimate of persons per household in Moreno Valley. This estimate can be multiplied by the number of proposed residential units to estimate a plan/project's resident population.
- **Proposed Number of Beds.** For projects such as group homes, assisted living facilities, nursing homes, or similar uses, the number of beds can be used to determine the resident population.
- **United States Green Building Council.** The United States Green Building Council has published a summary of building area per employee by business type. These rates, which are expressed in terms of square feet per employee, can be utilized to estimate the number of employees a plan/project would require. This document is included as Appendix G. If more locally appropriate estimates for employee generation rates by type of commercial use are available, those may also be utilized.

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48 "Mitigation" is a term of art for the modeling input and is not equivalent to mitigation measures that may apply to the CEQA impact analysis.

49 CAPCOA. 2010. Quantifying Greenhouse Gas Mitigation Measures. August 2010. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

6.3 Modeling Greenhouse Gas Emissions from Existing Land Use

For a plan/project that would result in a change in the plan area/project site's General Plan land use designation, emissions anticipated for the Moreno Valley 2024 General Plan Update land use designation should be calculated in conjunction with GHG emissions for the proposed plan/project to demonstrate whether the plan/project would be more or less GHG-intensive than development anticipated for the 2024 General Plan Update land use designation for the site. In this case, GHG emissions should be reported for both the existing and proposed scenarios. If there is a land use designation that allows multiple uses, the project could model the most intensive permitted use from the GHG perspective and compare the project to that as the baseline.

GHG emissions anticipated for the existing land use should be quantified using the methods described in Section 6.1, *Construction Greenhouse Gas Emissions*, and Section 6.2, *Operational Greenhouse Gas Emissions* with consistent assumptions between the two scenarios as applicable. Any GHG emissions reduction credits applied to the proposed plan/project scenario that are related to State legislation/policies (e.g., the RPS, vehicle standards, Title 24) or the plan area/project site location (e.g., proximity to transit, destination accessibility, etc.) should also be applied to the existing scenario.

GHG emissions reduction credits that are specific to the proposed plan/project (e.g., use of recycled water, increased density, installation of energy and/or water-efficient appliances, integration of below market rate housing, etc.) should only be included for the proposed plan/project scenario. In addition, care should be taken to identify any emissions reduction credits that might be unique to the existing land use designation that would not apply to the proposed plan/project. For example, if the existing land use designation allows for single-family residences and the proposed land use designation would allow for only commercial uses, then the existing scenario should include the GHG emissions reduction credit associated with the California 2022 Building Energy Efficiency Standards requirements for PV solar panels on residential uses that are three stories or less whereas the proposed plan/project scenario should not include this credit unless PV solar panels are included as a plan/project design feature.

7 Moving into the Future

Full implementation of the Moreno Valley CAP would reduce communitywide per capita GHG emissions by just over 65 percent below 1990 levels by 2030 to 986,572 MT CO_2e annually. Full implementation of the Moreno Valley CAP would leave a gap of approximately 145,161 MT CO_2e in 2045 that would need to be addressed to achieve carbon neutrality. This gap represents emissions that could be addressed by laws, regulations, policies, programs, and ordinances set forth by the federal and State governments, regional agencies, and local partners. The gap also represents the uncertainty that the City of Moreno Valley faces in taking a leadership role in addressing a challenge that has not been previously solved.

The Moreno Valley CAP acknowledges that additional actions beyond those identified in the plan would be necessary to achieve carbon neutrality and, thus, provides a mechanism for updating and adopting a new CAP to incorporate new measures and technologies that will further Moreno Valley toward meeting the target of carbon neutrality. As the Moreno Valley CAP is updated, the associated CEQA GHG Emissions Analysis Compliance Checklist will also be updated as needed to incorporate new strategies, measures, and/or actions that discretionary development projects would need to incorporate, as applicable, to demonstrate consistency with the latest CAP. At the time at which the City identifies strategies, measures, and/or actions to achieve the carbon neutrality target in totality, the City will adopt those collective strategies, measures, and actions in a public process following CEQA review, at which time that updated CAP would become a qualified GHG emissions reduction plan for projects after 2030. However, the quantitative thresholds included in this guidance document will not need to be updated, because residential, nonresidential, and mixed-use projects after 2030 will still need to achieve GHG emissions equivalent to net zero MT CO_2e per year to demonstrate consistency with the Moreno Valley CAP.

Finally, if future amendments or updates of the 2024 General Plan Update occur, then such amendments or updates will be incorporated into future updates of the CAP to ensure that project planners and applicants can continue to utilize the CEQA GHG emissions analysis streamlining process detailed in this document, given that this process is partly dependent on a plan’s/project’s consistency with the demographic projections and land use assumptions of the Moreno Valley 2024 General Plan Update.

Appendix A

Overview of Greenhouse Gas Emissions and Climate Change

Overview of Greenhouse Gas Emissions and Climate Change

Climate Change and Greenhouse Gases

Climate change is the observed increase in the average temperature of Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term "climate change" is often used interchangeably with the term "global warming," but "climate change" is preferred to "global warming" because it helps convey other changes in addition to rising temperatures. The baseline against which these changes are measured originates from historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate changes continuously, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed substantial acceleration in the rate of warming during the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed that the rise and continued growth of atmospheric CO_2 concentrations is unequivocally due to human activities in the IPCC's Sixth Assessment Report from 2021. Human influence has warmed the atmosphere, ocean, and land, which has led the climate to warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatonnes of anthropogenic CO_2 was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019.[50] Furthermore, since the late 1700s, estimated concentrations of carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O) in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity.[51] Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature.

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). The gases widely seen as the principal contributors to human-induced climate change include CO_2, CH_4, N_2O, fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere, and natural processes, such as oceanic evaporation, largely determine the atmospheric concentrations.

GHGs are emitted by natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are usually by-products of fossil fuel combustion, and CH_4 results from off-gassing associated with agricultural practices and

50 Intergovernmental Panel on Climate Change (IPCC). 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

51 United States Environmental Protection Agency (U.S. EPA). 2021. Climate Change Indicators: Atmospheric Concentrations of Greenhouse Gases. Last updated April 2021. https://www.epa.gov/climate-indicators/climate-change-indicators-atmospheric-concentrations-greenhouse-gases

landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and SF_6.[52]

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" (CO_2e), which is the amount of GHG emitted multiplied by the specific GWP. Carbon dioxide has a 100-year GWP of one. By contrast, CH_4 has a GWP of 30, meaning the global warming effect is 30 times greater than CO_2 on a molecule per molecule basis.[53, 54]

The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Without the natural heat-trapping effect of GHGs, the Earth's surface would be about 33 degrees Celsius (°C) cooler.[55] However, since 1750, estimated concentrations of CO_2, CH_4, and N_2O in the atmosphere have increased by 36 percent, 148 percent, and 18 percent, respectively, primarily due to human activity.[56] GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

Greenhouse Gas Emissions Inventories

Global Greenhouse Gas Emissions Inventory

In 2015, worldwide anthropogenic GHG emissions totaled 47,000 MMT CO_2e, which is a 43 percent increase from 1990 GHG levels. The largest source of GHG emissions were energy production and use (includes fuels used by vehicles and buildings), which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed three percent. These sources account for approximately 96 percent.[57]

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52 U.S. EPA. 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. April 2021. https://www.epa.gov/system/files/documents/2022-02/us-ghg-inventory-2022-main-text.pdf

53 The IPCC's *Sixth Assessment Report* from 2021 determined that methane has a GWP of 30. However, California Air Resources Board (CARB) State GHG inventories uses a GWP of 25 for methane, consistent with the IPCC's *Fourth Assessment Report* from 2007. Therefore, the GHG emissions inventory and forecast of the Moreno Valley CAP and the CEQA GHG emissions thresholds within this report utilize a GWP of 25, to provide consistency with the State's inventory.

54 IPCC. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

55 World Meteorological Organization. 2020. "Greenhouse Gases." https://public.wmo.int/en/our-mandate/focus-areas/environment/greenhouse%20gases

56 Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland. 2007. Changes in Atmospheric Constituents and in Radiative Forcing. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf

57 U.S. EPA. 2025. Climate Change Indicators: Global Greenhouse Gas Emissions. https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions

United States Greenhouse Gas Emissions Inventory

United States GHG emissions were 6,343.2 MMT CO_2e in 2022 (or 5,489.0 MMT CO_2e after accounting for sequestration), a 1.3 percent increase from 2021 emissions. The increase from 2021 to 2022 was driven by an increase in CO_2 emissions from fossil fuel combustion which increased one percent relative to previous years and is primarily due to the economic rebound after the COVID-19 pandemic. In 2022, the energy sector (including transportation) accounted for 83 percent of nationwide GHG emissions while agriculture, industrial and waste accounted for approximately nine percent, six percent, and three percent respectively.[58]

California Emissions Inventory

Based on a review of the CARB California Greenhouse Gas Inventory for the years between 2000-2022, California produced 371.1 MMT CO_2e in 2022, which is 9.3 MMT CO_2e lower than 2021 levels. The 2021 to 2022 decrease in emissions was primarily driven by reductions in the transportation and electricity sectors, due to increased use of renewable fuels, growth in zero-emission vehicle adoption, and a cleaner electricity generation mix, despite overall increases in power demand. The major source of GHG emissions in California is the transportation sector, which comprises 39 percent of the State's total GHG emissions. The industrial sector is the second largest source, comprising 23 percent of the State's GHG emissions while electric power accounts for approximately 16 percent. The magnitude of California's total GHG emissions is due in part to the State's large size and large population compared to other states. However, a factor that reduces California's per capita fuel use and GHG emissions as compared to other states is the relatively mild climate. In 2016, the State of California achieved the 2020 GHG emissions reduction target of reducing emissions to 1990 levels as emissions fell below 431 MMT CO_2e.[59] The annual 2030 Statewide target emissions level is 260 MMT CO_2e.[60]

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Long-term trends have found that each of the past five decades has been warmer than all the previous decades in the instrumental record. The decade from 2014 through 2023 stands as the warmest on record. In 2023, the global mean surface temperature (GMST) was approximately 1.45°C (0.12°C) higher than the 1850-1900 pre-industrial average, marking the highest annual temperature recorded to date.[61] The rate of GMST increase has accelerated, with recent analyses suggesting a warming rate of approximately 0.27°C per decade since 2010.[62] In addition to these findings, the latest IPCC report

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58 U.S. EPA. 2024. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

59 CARB. 2022. 2022 Scoping Plan for Achieving Carbon Neutrality. https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf

60 CARB. 2017. California's 2017 Climate Change Scoping Plan. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

61 World Meteorological Organization. Climate change indicators reached record levels in 2023: WMO (2024). Accessed at: https://wmo.int/news/media-centre/climate-change-indicators-reached-record-levels-2023-wmo

62 AP News. Pioneering scientist says global warming is accelerating. Some experts call his claims overheated (2023). Accessed at: https://apnews.com/article/global-warming-climate-change-accelerating-worse-92facd6145ab9ab32281ff5d641517f0

states that “human-induced climate change is already affecting many weather and climate extremes in every region across the globe.”[63] These climate change impacts include climate change sea level rise, increased weather extremes, and substantial ice loss in the Arctic over the past three decades.

According to *California’s Fourth Climate Change Assessment*, Statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years.[64] In addition to Statewide projections, *California’s Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the State and regionally-specific climate change case studies.[65] However, while there is growing scientific consensus about the possible effects of climate change at a global and Statewide level, current scientific modeling tools are unable to predict what local impacts may occur with a similar degree of accuracy. California is currently preparing the Fifth Climate Change Assessment with new climate model data.

A summary follows of some of the potential effects identified in the *California’s Fourth Climate Change Assessment* that could be experienced in California as a result of climate change.

Hydrology and Sea Level Rise

Climate change could affect the intensity and frequency of storms and flooding.[66] Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 1993 to 2024, observed by satellites, is approximately 3.3 millimeters per year.[67] The rate of global mean sea level rise in the past ten years (2014–2023) is more than twice the rate of sea level rise in the first decade of the satellite record (1993–2002).[68] Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. The most recent IPCC report predicts a mean sea level rise of 11 to 21.5 inches by 2100 under the lowest emissions scenario and a rise of 25 to 40 inches by 2100 under the very high emissions scenario.[69]

A rise in sea levels could erode 31 to 67 percent of California beaches and cause flooding of approximately 370 miles of coastal highways during 100-year storm events. This would also

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63 IPCC. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

64 California, State of. 2018. California’s Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

65 *Ibid.*

66 *Ibid.*

67 National Aeronautics and Space Administration. 2024. “Global Climate Change – Vital Signs of the Planet – Sea Level.” https://climate.nasa.gov/vital-signs/sea-level/

68 World Meteorological Organization. 2024. Climate change indicators reached record levels in 2023. https://wmo.int/news/media-centre/climate-change-indicators-reached-record-levels-2023-wmo#:~:text=The%20WMO%20report%20confirmed%20that%202023%20was,%C2%B1%200.12%20%C2%B0C)%20above%20the%20pre%2Dindustrial%20baseline.&text=The%20global%20mean%20near%2Dsurface%20temperature%20in%202023,0.12%20%C2%B0C%20above%20the%20pre%2Dindustrial%201850%E2%80%931900%20average.

69 IPCC. 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)] Cambridge University Press. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf

jeopardize California's water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure.[70] Furthermore, increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Air Quality

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century.[71] Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore the indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the State has increased, and wildfires have occurred at higher elevations in the Sierra Nevada Mountains.[72] If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the State. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rain could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them.[73]

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in Statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common.[74] This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and the potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meters along the central and southern California coasts.[75] The Sierra snowpack provides the majority of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack.[76] Projections indicate that average spring

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[70] California, State of. 2018. California's Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

[71] Ibid.

[72] Ibid.

[73] California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. March 2009. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf

[74] California Department of Water Resources. 2018. Indicators of Climate Change in California. May 2018. https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf

[75] California, State of. 2018. California's Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

[76] Ibid.

snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from the historical average by 2050.[77]

Agriculture

California has an over $59 billion annual agricultural industry that produces over a third of the country's vegetables and three-quarters of the country's fruits and nuts.[78] Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks. Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality.[79]

Ecosystems and Wildlife

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions as a result of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage.[80,81]

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77 Ibid.

78 California Department of Food and Agriculture. 2024. California Agricultural Production Statistics. https://www.cdfa.ca.gov/Statistics/

79 California Climate Change Center (CCCC). 2006. Climate Scenarios for California.

80 Parmesan, C. 2006. Ecological and Evolutionary Responses to Recent Climate Change.

81 California, State of. 2018. California's Fourth Climate Change Assessment Statewide Summary Report. August 27, 2018. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

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Appendix B

GHG Threshold Calculations

GHG Thresholds

1. Inventory & BAU Forecast Summary

Inventory and BAU Forecast Summary by Sector

Forecast Scenario	Sector	Annual 2030 GHG Emissions (MT CO_2e) Existing (2019)	New (2030-2019)	Total (2030)	Subsector
BAU	Residential Electricity + T&D	100,411	54,930	155,340	Residential
	Nonresidential Electricity + T&D	89,112	44,973	134,085	Nonresidential
	Residential Natural Gas	115,917	63,429	179,346	Residential
	Residential Natural Gas Leaks	29,099	15,923	45,021	Residential
	Nonresidential Natural Gas	31,110	15,701	46,811	Nonresidential
	Nonresidential Natural Gas Leaks	7,810	3,941	11,751	Nonresidential
	On-road Passenger Vehicles	560,656	178,748	739,403	Residential/Nonresidential
	On-road Commercial Vehicles	94,883	68,887	163,770	Nonresidential
	On-road Buses	3,140	1,239	4,378	Residential/Nonresidential
	Off-road Equipment	56,673	1,681	58,354	Residential/Nonresidential
	Solid Waste	160,875	63,460	224,336	Residential/Nonresidential
	Water	7,020	2,769	9,789	Residential/Nonresidential
	Wastewater	889	351	1,240	Residential/Nonresidential
	Consistency Check	-		-	

2. Demographics Summary

Inventory and Forecast Demographics by Category

Demographic	Annual 2030 Demographics Existing (2019)	New (2030-2019)	Total (2030)
Residents	176,614	63,814	240,428
Jobs	53,118	26,808	79,925
Service Population	229,731	90,621	320,353

3. Emissions Reduction Summary

Legislative Reductions & Measure Reducations by Category and Sector

Legislation/Measure	2030 GHG Emissions (MT CO_2e) Residential	Nonresidential	Residential/ Nonresident	Consistency Check
State Legislation				
Transportation Legislation	0	18,039	161,856	-
California Green Building Code (Title 24)	34,359	13,421	0	-
California RPS (SB 100)	48,612	47,810	8,840	-
CAP GHG Reduction Measure				
BE-1 Procure 70% of Moreno Valley Electric Utility (MVU) elec	4,860	8,538	0	
BE-2 Decarbonize new residential construction by at least 95%	19,522	0	0	
BE-3 Decarbonize new non-residential construction by at least	0	5,106	0	
BE-4 Decarbonize existing residential buildings to reduce exist	11,305	0	0	
BE-5 Decarbonize existing non-residential buildings to reduce	0	1,645	0	
T-1 Implement programs to increase active transportation mo	0	0	2,352	
T-2 Work with the Riverside Transit Agency (RTA) to increase p	0	0	9,767	
T-3 Implement programs to increase the work-from-home rat	0	0	61,426	
T-4 Achieve zero-emission vehicle (ZEV) adoption rates of 35%	0	15,997	95,070	
T-5 Implement programs to support California Air Resources B	0	0	18,335	
SW-1 Achieve, monitor, and maintain SB 1383 requirements to	0	0	195,661	
CS-1 Increase carbon sequestration in the community by procu	0	0	4,424	
CS-2 Increase carbon sequestration by preserving existing mat	0	0	106	-

4. Allocate savings between existing/new and residential/nonresidential

-Reductions are allocated to existing and new developments using the existing, new, and total demographics breakdown in Section 2. Allocation is based on the logic in the Allocation column below.

-Residential /Nonresidential reductions are allocated to residential and nonresidential sectors, separately, based on the population, job, and service population demographics breakdown in Section 2.

Category	Allocation between Existing and New Developments	2030 Emissions (MT CO_2e) Existing Residential	Existing Nonresidential	New Residential	New Nonresidential	Consistency Check
BAU Forecast						
BAU Forecast	See F6:F18	852,191	405,402	309,092	206,939	-
State Legislation Reductions						
Transportation Legislation	Both	89,233	38,826	32,242	19,595	-
California Green Building Code (Title 24)	New Only	0	0	34,359	13,421	-
California RPS (SB 100)	Both	40,583	33,240	14,663	16,776	-

Allocation Dropdown
Both
Existing Only
New Only

CAP GHG Reduction Measure Reductions						
BE-1 Procure 70% of Moreno Valley Electric Utility (MVU) elec	Both	3,570	5,674	1,290	2,864	-
BE-2 Decarbonize new residential construction by at least 95%	New Only	0	0	19,522	0	-
BE-3 Decarbonize new non-residential construction by at least	New Only	0	0	0	5,106	-
BE-4 Decarbonize existing residential buildings to reduce exist	Existing Only	11,305	0	0	0	-
BE-5 Decarbonize existing non-residential buildings to reduce	Existing Only	0	1,645	0	0	-
T-1 Implement programs to increase active transportation mo	Both	1,297	390	469	197	-
T-2 Work with the Riverside Transit Agency (RTA) to increase p	Both	5,385	1,619	1,946	817	-
T-3 Implement programs to increase the work-from-home rat	Both	33,865	10,185	12,236	5,140	-
T-4 Achieve zero-emission vehicle (ZEV) adoption rates of 35%	Both	52,413	26,395	18,938	13,321	-
T-5 Implement programs to support California Air Resources B	Both	10,108	3,040	3,652	1,534	-
SW-1 Achieve, monitor, and maintain SB 1383 requirements to	Both	107,870	32,443	38,975	16,373	-
CS-1 Increase carbon sequestration in the community by proc	Both	2,439	734	881	370	-
CS-2 Increase carbon sequestration by preserving existing mat	Both	59	18	21	9	-
State Legislation and CAP GHG Reduction Measure-Adjusted Forecast						
Legislation and Measure-Adjusted Forecast	=BAU Forecast - State Leg. Reductions - CAP Measure Reductions	494,065	251,194	129,898	111,416	-
Percentage reductions in each category		46%	20%	23%	12%	

5. 2030 GHG Thresholds

2030 GHG Thresholds by Category and Sector

Sector	Units	2030 New Growth GHG Threshold	"Existing GHG Thresholds"	2030 Total Population - Per Capita Threshold
New Residential	per resident	2.04	2.80	2.60
New Nonresidential	per job	4.16	4.73	4.54
New Mixed-Use	per service person	2.66	3.24	3.08

6. Summary Table

2030 Summary

	Existing	New Residential	New Nonresidential	Total	Consistency Check
BAU Forecast	1,257,593	309,092	206,939	1,773,624	-
State Legislation	201,882	81,264	49,791	332,937	-
CAP Building Energy Measures	22,194	20,812	7,969	50,976	
CAP Transportation Measures	144,697	37,240	21,010	202,947	
CAP Solid Waste Measures	140,313	38,975	16,373	195,661	
CAP Carbon Sequestration Measures	3,249	902	379	4,530	-
Emissions Reductions from BAU	512,335	179,194	95,523	787,052	
Remaining Total GHG Emissions	745,259	129,898	111,416	986,572	-

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Appendix C

United States Green Building Council Building Area per Employee by Business Type Rates[82]

[82] United States Green Building Council. 2008. "Building Area per Employee by Business Type." May 13, 2008.

BUILDING AREA PER EMPLOYEE BY BUSINESS TYPE

Land-Use	ITE Land-Use Code	ITE Sq.Ft./ Employee	USDOE Sq.Ft./ Employee	SANDAG Sq.Ft./ Employee
Commercial Airport	21	224		
General Aviation Airport	22	392		
Truck Terminal	30	427		
General Light Industrial	110	463		
Heavy Industrial	120	549		
Industrial Park	130	500		
Manufacturing	140	535		
Warehousing	150	781	2114	
Elementary School	520	1250	1131	
High School	530	1587		
Hospital	610	372	486	
General Office - Suburbs	710	304		
Corporate HQ - Suburbs	714	260		
Single Tenant Office	715	295		
Medical-Dental Building	720	207		
U.S. Post Office	732	230		
Office Park	750	278		
Research & Development Center	760	405		
Business Park	770	332		249
Building Material - Lumber Store	812	806		
Specialty Retail Store	814	549		
Discount Store	815	654		
Hardware Store	816	1042		
Nursery-Garden Center	817	529		
Quality Restaurant (Sit Down)	831	134		
High Turnover (Sit Down)	832	100		
Fast Food w/o drive-thru	833	70		
Fast Food w/ drive-thru	834	92		
Grocery			938	
Lodging			1124	917
Bank				317
Office under 100,000 sq.ft.				228
Office over 100,000 sq.ft.				221
Neighborhood Retail				588
Community Retail				383

Sources:
ITE -- Institute of Transportation Engineers
USDOE -- U.S. Department of Energy
SANDAG -- San Diego Assn of Governments

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MORENO VALLEY
WHERE DREAMS SOAR