



City of Moreno Valley CLIMATE ACTION PLAN

Adopted June 15, 2021

DYETT & BHATIA
Urban and Regional Planners



Table of Contents

Executive Summary	ES-1
1 Introduction	1-1
1.1 Scope and Purpose	1-1
1.2 Climate Change and Greenhouse Gases Overview	1-2
1.3 California GHG Reduction Legal Framework	1-6
1.4 Federal and State Emissions Reduction Strategies	1-7
1.5 Regional and Local Emissions Reduction Strategies	1-11
1.6 Planning Process	1-13
1.7 How to Use This Plan	1-16
2 Emissions Inventory	2-1
2.1 Methodology	2-1
2.2 Emissions Inventory	2-3
3 Greenhouse Gas Reduction Targets and Forecasts	3-1
3.1 GHG Reduction Target	3-1
3.2 Business as Usual Forecast	3-2
3.3 2040 General Plan Forecast	3-6
4 CAP GHG Reduction Measures	4-1
4.1 Transportation	4-2
4.2 Industrial	4-4
4.3 Residential	4-5
4.4 Commercial	4-7
4.5 Off-Road Equipment	4-8
4.6 Public Services and Public Lighting	4-10
4.7 Natural Resources	4-11
4.8 Modified Forecast	4-12
5 Implementation, Monitoring and Reporting	5-1
5.1 Monitoring Metrics and Schedule	5-1
5.2 Monitoring and Reporting	5-11
Appendix A: Climate Change Informational Resources	A-1
Appendix B: Effectiveness of GHG Reduction Strategies	B-1
Appendix C: Potential Project Level GHG Reduction Measures	C-1

List of Figures

Figure 1-1: Greenhouse Gas Effect	1-3
Figure 1-2: Change in Average Global Temperatures	1-5
Figure 2-1: 2018 GHG Emissions by Sector	2-6
Figure 2-2: Electricity Emissions by Sector	2-8
Figure 2-3: Natural Gas Emissions by Sector	2-9
Figure 3-1: Comparison of 2018 Emissions to GHG Reduction Targets.....	3-2
Figure 3-2: Comparison of 2040 Emissions to GHG Reduction Targets.....	3-8
Figure 4-1: Comparison of 2040 Emissions Forecast with CAP Strategies to GHG Reduction Targets.....	4-13
Figure 5-1: Process of Climate Action Planning	5-11

List of Tables

Table ES-1: GHG Emissions Forecast and Targets (MTCO _{2e} per year).....	ES-3
Table 2-1: Residential, Commercial, and Industrial (RCI) Inputs	2-3
Table 2-2: 2018 GHG Emissions (MTCO _{2e} per year)	2-7
Table 2-3: Electricity Emissions by Sector (MTCO _{2e} per year)	2-8
Table 2-4: Natural Gas Emissions by Sector (MTCO _{2e} per year)	2-9
Table 3-2: 2018 Emissions and BAU 2040 Forecast Emissions by Sector (MTCO _{2e} per year).....	3-6
Table 3-2: 2018 Emissions, BAU 2040 Forecast, and With Project 2040 Forecast Emissions by Sector (MTCO _{2e} per year)	3-7
Table 4-1: Transportation CAP Strategies.....	4-2
Table 4-2: Industrial CAP Strategies	4-4
Table 4-3: Residential CAP Strategies.....	4-6
Table 4-4: Commercial CAP Strategies.....	4-8
Table 4-5: Off-Road CAP Strategies	4-9
Table 4-6: Public CAP Strategies.....	4-10
Table 4-7: Natural Resources CAP Strategies.....	4-11
Table 4-8: 2040 GHG Emissions Forecast with CAP Strategies (MTCO _{2e} per year).....	4-12
Table 5-1: CAP Implementation Matrix.....	5-3

Executive Summary

The Moreno Valley Climate Action Plan (CAP) is designed to reinforce the City's commitment to reducing greenhouse gas (GHG) emissions, and demonstrate how the City will comply with State of California's GHG emission reduction standards. As a Qualified GHG Reduction Strategy, the CAP will also enable streamlined environmental review of future development projects, in accordance with the California Environmental Quality Act (CEQA).

The CAP includes:

- ❖ An inventory of the city's GHG emissions;
- ❖ Forecasts of future GHG emissions;
- ❖ Measures to reduce GHG emissions consistent with State requirements; and
- ❖ Monitoring and reporting processes to ensure targets are met.

The CAP, which has been prepared concurrently with the updated Moreno Valley General Plan, provides an analysis of GHG emissions to the year 2040, which is the horizon year for the General Plan.

Local Context

Moreno Valley is an incorporated city located within the northwestern portion of Riverside County in the southern, Inland Empire portion of the state of California. More than two million people live in Riverside County and nearly 210,000 people (about 10.5 percent of the county) reside within the City of Moreno Valley. It is the second-largest city in Riverside County by population and one of the Inland Empire's major population centers. Nearly 60 percent of Moreno Valley residents are Hispanic or Latino. The largest industries in Moreno Valley are retail trade, health care, and transportation and warehousing.

Moreno Valley has a mild semi-arid climate, with Mediterranean characteristics. The summer temperatures average in the high 90s, though many days reach well above 100°F. The dominant meteorological feature affecting the region is the Pacific High Pressure Zone, which produces the prevailing westerly to northwesterly winds. These winds tend to blow pollutants away from the coast toward the inland areas, resulting in high concentrations of air pollutants and GHG emissions.

Excessive generation of GHG emissions can exacerbate the effects of climate change, which poses a threat to human health, including mental health, and access to clean air, safe drinking water, nutritious food, and shelter. Moreno Valley residents who are already more vulnerable to health challenges are likely to be the most affected by climate change. These populations tend to be the young

and the old, low-income individuals, and those who are already sick. Increases in extreme heat events can increase the risk of heat-related illness or death, or the worsening of chronic health conditions. Food scarcity and higher food prices from impacts to agriculture can cause increased hunger and reduced availability of nutrition. The increased frequency of natural disasters such as floods, droughts, wildfires, and storm surges can cause injury or death, illness, and increases or shifts in infectious disease. Local actions to reduce GHG emissions will help improve quality of life and public health for all, including the most vulnerable.

State-Mandated Local GHG Emissions Targets and Guidelines

The CAP reflects guidelines established in the 2017 Scoping Plan prepared by the California Air Resources Board (CARB). The Scoping Plan, designed to implement the State's not-to-exceed GHG emission targets set in Executive Order S-3-15 and Senate Bill 32, recommends that local governments target 6.0 metric tons carbon dioxide equivalent (MTCO_{2e}) per capita per year in 2030 and 2.0 MTCO_{2e} per capita per year in 2050 in their CAPs. The proposed 2040 target of 4.0 MTCO_{2e} per capita per year is determined using a linear trajectory in emissions reduction between 2030 and 2050.

Emissions Forecast and GHG Emissions Reduction Strategies

The 2018 emissions inventory and 2040 emissions forecast covers direct GHG emissions from sources within the boundaries of Moreno Valley. 2018 is the most recent year for which all data is available. Indirect emissions associated with the consumption of energy that is generated outside the borders of the city, such as electricity, are also included. The emissions inventory and forecast tally emissions from nine sectors: residential, commercial, industrial, transportation, solid waste, water, wastewater, off-road equipment, and public lighting.

The City's General Plan includes closely integrated land use and transportation systems and policies designed to foster a more sustainable community. Table ES-1 shows the 2018 emissions inventory, along with the 2040 emissions forecast that takes into account planned State actions and the goals, policies, and actions proposed in the 2040 General Plan and incorporates results of the traffic forecasts conducted for the General Plan Update. Transportation, industry, and residential uses are found to generate the majority of emissions under existing conditions and in 2040. This strategy successfully reduces per capita emissions in 2040 and additional greenhouse gas reduction strategies identified in Chapter 4, provide for further emissions reduction in a range of sectors, with the majority of emissions reduction coming from the transportation, industrial, and residential sectors. Strategies address transportation demand management, electric vehicle infrastructure, building energy efficiency upgrades, installation of solar photovoltaic systems, resource conservation, and more. With adoption of these strategies, Moreno Valley will meet its target for 2040 and demonstrate consistency with established State reduction goals.

TABLE ES-1: GHG EMISSIONS FORECAST AND TARGETS (MTCO₂E PER YEAR)			
Year	GHG Emissions (MTCO₂e)	Per Capita Emissions (MTCO₂e per capita)	GHG Emissions Target (MTCO₂e per capita)
2018	866,410	4.17	-
2030	-	-	6.0
2040 BAU	1,411,346	5.50	4.0
2040 With Project	1,325,101	5.25	4.0
2040 With Project + CAP	913,365	3.62	4.0
2050	-	-	2.0

Source: Dyett & Bhatia, 2021.

Monitoring and Reporting Progress

The City will periodically monitor and make public a report on progress towards achieving the emissions targets, potentially every five years, unless otherwise required more frequently by State law. The monitoring report will include information on the status of the federal and State level emissions reductions measures identified in Chapter 4 of this CAP, as well as any new efforts that may emerge in the reporting year.

Updating the GHG Inventory and the CAP

The City will update the GHG inventory periodically. If an updated inventory reveals that Moreno Valley is not making adequate progress toward meeting the GHG target, or that new technologies and programs emerge that warrant inclusion in the CAP, the City will adjust the CAP by modifying, adding, and/or replacing policies in the General Plan or elsewhere.

EXECUTIVE SUMMARY

This page intentionally left blank.

1

Introduction

1.1 Scope and Purpose

Background and Purpose

The Moreno Valley Climate Action Plan (CAP) – the City's first CAP – is designed to reinforce the City's commitment to reducing greenhouse gas (GHG) emissions and demonstrate how the City will comply with State of California's GHG emission reduction standards. As a Qualified GHG Reduction Strategy, the CAP will also enable streamlined environmental review of future development projects, in accordance with the California Environmental Quality Act (CEQA).

The CAP has been prepared concurrently with the updated Moreno Valley General Plan, reflecting the City's most current land use and transportation strategy, and GHG implications of various General Plan's goals and policies. The General Plan Environmental Impact Report (EIR) also serves as the EIR on the CAP, and the GHG analysis in the CAP is fully synchronized with the analysis in the EIR.

The General Plan includes strategies such as transit-oriented and mixed-use development, integrated transportation and land use planning, promotion of bicycle and pedestrian movements, and parking and transportation demand management. It also includes goals and policies to promote energy efficiency, waste reduction, and resource conservation and recycling. These strategies, goals, and policies would result in GHG reductions compared to baseline trends.

As a document adopted by the City of Moreno Valley City Council, the CAP applies to the municipal limits of the City of Moreno Valley. All information and data presented in the CAP, unless otherwise noted, is for the area within the city's municipal limits. The General Plan covers a larger Planning Area that includes nearly 10,000 acres of land within unincorporated Riverside County that is largely undeveloped natural open space or in use for agricultural purposes.

1: INTRODUCTION

CAP Contents

The CAP includes:

- ❖ An inventory of the city's GHG emissions;
- ❖ Forecasts of future GHG emissions; and
- ❖ Actions that demonstrate the City of Moreno Valley's commitment to achieve State GHG reduction targets by monitoring and reporting processes to ensure targets are met.

While there is no sunset year for the CAP, the CAP provides analysis of GHG emissions to the year 2040, which is the General Plan horizon year.

Community Vision and Environmental Stewardship

As part of the General Plan update visioning process, residents and other stakeholders were asked to describe those qualities that make Moreno Valley a great community, so that the common goal of preserving and enhancing those qualities may serve as a guide for all planning efforts. One of the General Plan's Guiding Principles is to "prioritize clean air, water, fresh food, and community health."

In addition, the General Plan reflects several high-level values that can be applied across several topics in the General Plan, and serve as the document's organizing themes. Chapter 6 of the General Plan, Safety, prioritizes actions that build community resilience to climate change and reduce greenhouse gases. Chapter 8, Environmental Justice, establishes policies to reduce exposure to air pollutants and greenhouse gases, incorporating environmental justice in Moreno Valley's work to address climate change. Chapter 10, Open Space and Resource Conservation, highlights the City of Moreno Valley's commitment to preservation and restoration of open spaces and sensitive habitat, which can reduce greenhouse gas emissions through resource conservation and carbon sequestration. The effects of the goals, policies, and actions proposed in the 2040 General Plan are incorporated into the projected emissions forecast discussed in Chapter 3.

1.2 Climate Change and Greenhouse Gases Overview

Greenhouse Effect and GHGs

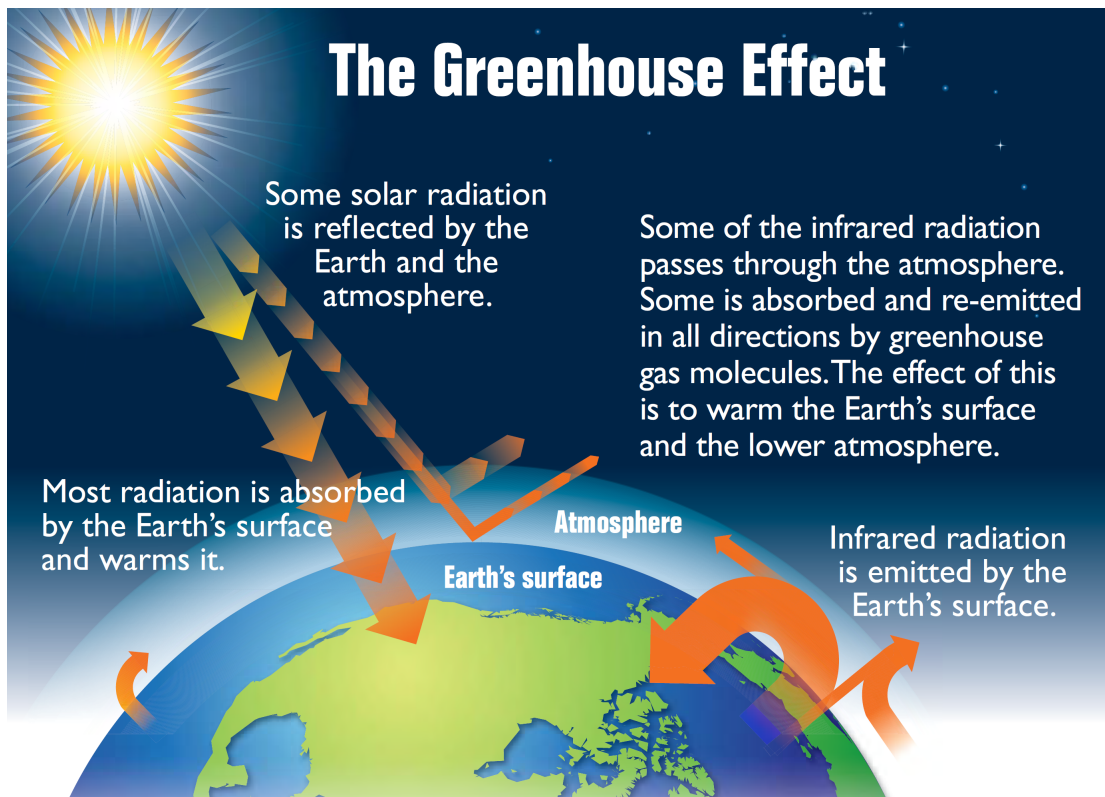
Gases that trap heat in the atmosphere are often called "greenhouse gases" or GHGs. The greenhouse effect traps heat in the troposphere through a threefold process: Short-wave radiation emitted by the sun is absorbed by the earth; the earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation, emitting some of it into space and the rest back toward the earth. This "trapping" of the long-wave

(thermal) radiation emitted back toward the earth is the underlying process of the greenhouse effect (Figure 1-1).

Principal GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and water vapor (H₂O). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Since different gases contribute to the greenhouse effect in different proportions, the term CO₂e (carbon dioxide equivalent) is used to calibrate each of the different GHGs in terms of the amount of CO₂ that would produce the same thermal effect.

The greenhouse effect is a natural process that contributes to regulating the earth's temperature. Without it, the temperature of the earth would be about 0°F (-18°C) instead of its present 59°F (15°C) and unlikely to support human life in its current form.

Figure 1-1: Greenhouse Gas Effect



Source: United States Environmental Protection Agency, 2016.

1: INTRODUCTION

Carbon Cycle and Global Temperatures

The global carbon cycle is complex and incorporates natural sources of atmospheric carbon dioxide, including respiration of aerobic organisms, wildfires, and volcanic outgassing, and sinks such as the removal of CO₂ by land plants for photosynthesis, and absorption by the ocean. Data collected on global GHG concentrations over the past 800,000 years demonstrates that the concentration of CO₂, the principal GHG, has increased dramatically since pre-industrial times, from approximately below 300 parts per million (ppm) in 1800, to about 353 ppm in 1990 and 413 ppm in 2020¹.

Increased atmospheric concentrations of GHGs have led to a rise in average global temperatures. Figure 1-2 shows the increase in global temperatures from 1880 to 2020. While average global temperatures fluctuate on a yearly basis, the general trend shows a long-term temperature increase. Since 1976, every year has been warmer than the long-term average. In 2020, the average temperature across global land and ocean surfaces was 1.76°F (0.98°C) above the twentieth-century average². In 2020, 11 of 12 monthly global land and ocean temperature departures from average ranked among the five warmest for their respective months, giving way to the second warmest year in NOAA's 141-year record³. The consensus among climate scientists is that earth's climate system is unequivocally warming, and rigorous scientific research demonstrates that anthropogenic⁴ greenhouse gases are the primary driver.

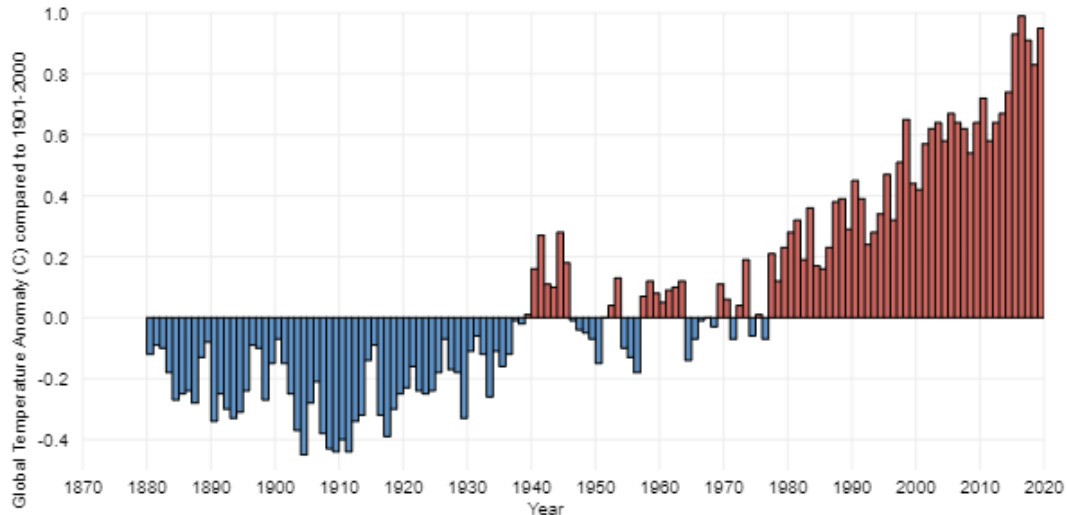
¹ Trends in Atmospheric Carbon Dioxide. February 22, 2021. NOAA Earth System Research Laboratories. <https://www.esrl.noaa.gov/gmd/ccgg/trends/global.html>. Accessed on: February 24, 2021.

² Assessing the Global Climate in 2020. January 14, 2021. NOAA National Centers for Environmental Information. <https://www.ncei.noaa.gov/news/global-climate-202012>. Accessed on: February 24, 2021.

³ Climate at a Glance: Global Rankings. February 2021. NOAA National Centers for Environmental Information. https://www.ncdc.noaa.gov/cag/global/rankings/globe/land_ocean/202001. Accessed on: February 24, 2021.

⁴ Caused by human activities

Figure 1-2: Change in Average Global Temperatures



Source: National Oceanic and Atmospheric Administration, 2021.

Climate Change

Global climate change concerns are focused on the potential effects of climate change resulting from excessive GHGs in the atmosphere and how communities can mitigate effects and adapt to change in the short and long term.

Numerous observations document the impacts of global climate change, including increases in global average air and ocean temperatures, the widespread melting of snow and ice, more intense heat waves, and rising global average sea level. Scientists have high confidence that global temperatures will continue to rise in the foreseeable future, largely due to anthropogenic GHG emissions. In addition to the physical impacts to the environment from increased temperatures, sea level rise, and more frequent extreme weather events, global climate change is predicted to continue to cause ecological and social impacts. Ecological impacts of climate change include greater risk of extinction of species, loss of species diversity, and alteration of global biogeochemical cycles, which play an essential role in nutrient distribution. The social impacts of climate change include impacts on agriculture, fisheries, energy, water resources, forestry, construction, insurance, financial services, tourism, and recreation.

According to the International Panel on Climate Change (IPCC) in North America, the regional impacts of climate change are a forecast of decreased snowpack in the western mountains; a 5 to 20 percent decrease in the yields of rain-fed agriculture in some regions; and increased frequency, intensity and duration of heat waves in cities that currently experience them.

1: INTRODUCTION

In California, the Climate Action Team (CAT)—a group of state agency secretaries and the heads of agencies, boards, and departments, led by the Secretary of the California Environmental Protection Agency—synthesized current research on the environmental and economic impacts of climate change. The CAT found that climate changes are poised to affect virtually every sector of the state's economy and most ecosystems. Key findings of the CAT include predicted decreases in water supply that could cause revenue losses of up to \$3 billion per year in the agricultural sector by 2050, increases in statewide electricity demand of up to 55 percent by the end of the century, increased wildfire risk that may cause monetary impacts of up to \$2 billion per year by 2050, and ecosystems impacts affecting California's historic ranching culture and a source of local, grass-fed beef. The 2020 wildfire season alone cost the California fire department \$2.5 billion and resulted in \$10 billion in insurance claims⁵.

Higher temperatures, changes in precipitation, decreased water supplies accompanied by increased demand, increased risk of wildfire, a greater number of extremely hot days, the decline or loss of plant and animal species, and other impacts of climate change are expected to continue to affect the region.

1.3 California GHG Reduction Legal Framework

California has taken an aggressive stance to reduce GHG emissions in order to combat the impacts of climate change; some of the State actions include the following.

Governor's Executive Order S-3-05

Executive Order S-3-05 (EO S-3-05) issued in 2005 recognizes California's vulnerability to increased temperatures causing human health impacts, rising sea levels, and a reduced Sierra snowpack due to a changing climate. The Executive Order established targets to reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Global Warming Solutions Act of 2006 and 2008 CARB Scoping Plan

The Global Warming Solutions Act of 2006 (Assembly Bill 32, or AB 32) codifies the targets set in EO S-3-05 of statewide reductions to 1990 emissions levels by 2020. AB 32 directs the California Air Resources Board (CARB) to develop and implement a scoping plan and regulations to meet the 2020 target.

CARB approved the Scoping Plan in 2008, which provides guidance for local communities to meet AB 32 and EO S-3-05 targets. The Scoping Plan adopted a quantified cap on GHG emission representing 1990 emission levels, instituted a

⁵ Damage from California's wildfires estimated at \$10 billion, experts say. October 9, 2020. Louie, David. <https://abc7news.com/california-wildfires-cost-of-cal-fire-stanford-wildfire-research/6897462/>. Accessed on: February 24, 2021.

schedule to meet the emission cap, and developed tracking, reporting, and enforcement tools to assist the State in meeting the required GHG emissions reductions.

Governor's Executive Order S-3-15 and 2017 CARB Scoping Plan

Executive Order S-3-15 (EO S-3-15) issued in 2015 established an interim target to reduce GHG emissions to 40 percent below 1990 levels by 2030. In 2016, the Legislature passed Senate Bill (SB) 32, which codified the 2030 GHG emissions reduction target. To reflect this target, CARB's 2017 Climate Change Scoping Plan Update recommends that local governments target 6 metric tons carbon dioxide equivalent (MTCO₂e) per capita per year in 2030 and 2 MTCO₂e per capita per year in 2050.

The CAP's GHG emission targets are based on meeting the goals set in EO S-3-15 and SB 32, following the CAP guidelines established in the 2017 Scoping Plan.

Governor's Executive Order B-55-18

Executive Order B-55-18 (EO B-55-18) issued in 2018 established a statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter. EO B-55-18 is established in addition to the existing statewide targets of reducing GHG emissions. To achieve this target, remaining emissions must be offset by equivalent net removals of CO₂ from the atmosphere, including through sequestration in forests, soils and other natural landscapes.

The CAP's GHG emission targets are not based on the goals set in EO B-55-18 given the General Plan's horizon date of 2040. However, strategies recommended in the CAP would contribute towards carbon sequestration goals established in EO B-55-18.

1.4 Federal and State Emissions Reduction Strategies

Several federal and state standards have been adopted to reduce GHG emissions, in addition to and in support of the targets set in EO S-3-15 and SB 32.

Federal Standards

Corporate Average Fuel Economy Standards

The United States Environmental Protection Agency (EPA) regulates and tests gas mileage or fuel economy in order to deter air pollution in the United States. Since the transportation sector produces 29 percent⁶ of GHG emissions in the U.S. as a whole, fuel economy regulations are an important way to reduce GHG emissions. The EPA's Corporate Average Fuel Economy (CAFE) standards require vehicle

⁶ In 2017, GHG emissions from transportation were about 29 percent of the total 6,457 million metric tons CO₂e.

1: INTRODUCTION

manufacturers to comply with the gas mileage or fuel economy standards to reduce energy consumption by increasing the fuel economy of cars and light trucks. The most recent CAFE GHG emissions standards were set in 2012, which will increase the fuel economy to 54.5 miles per gallon average for cars and light trucks by Model Year 2025, and reduce U.S. oil consumption by 12 billion barrels per year.

In August 2018, the EPA and Department of Transportation's National Highway Traffic Safety Administration (NHTSA) released a new plan for fuel efficiency called the Safer Affordable Fuel Efficient Vehicles rule (SAFE), which would freeze federal standards at the 2020 level through model year 2026. The proposed rule also revokes California's ability to set its own, higher fuel efficiency standards. In June 2019, 17 worldwide automakers appealed to the White House and California to work together on a single national standard. In July 2019, California and four major automakers (BMW, VW, Ford, and Honda) signed a voluntary agreement that preempts this rollback and introduces an additional proposed successor to the existing fuel efficiency standards. This proposal would extend the current 2025 model year standard to 2026, and change the original year-over-year 4.7 percent GHG reduction over four years goal to 3.7 percent over five years (2022 through 2026). Additionally, the proposal would provide incentives to companies that sell electric vehicles and install GHG-reducing technologies.

Gas Guzzler Tax

The EPA imposes the Gas Guzzler Tax on manufacturers of new cars that do not meet required fuel economy levels, to discourage the production and purchase of fuel-inefficient vehicles.

Renewable Fuel Standard Program

The EPA established a renewable fuel standard to include a minimum volume of renewable fuel in 2017, which applies to all gasoline and diesel produced or imported. The EPA gradually increases new volume requirements annually for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel.

E0 13783 and Affordable Clean Energy Rule

On August 3, 2015, the EPA finalized the Carbon Pollution Standards, which set national limits on the amount of carbon pollution that new, modified, and reconstructed power plants will be allowed to emit. On the same date, the EPA also finalized the Clean Power Plan, setting national limits on the amount of carbon pollution from existing power plants. The EPA also approved oil and natural gas air pollution standards in 2016 to reduce pollution from the oil and natural gas industry.

State Standards

California Senate Bill 375

SB 375 (2008) requires each Metropolitan Planning Organization (MPO) in the state to adopt a Regional Transportation Plan (RTP) aimed at achieving a coordinated and balanced regional transportation system, including mass transit, highways, railroads, bicycles, and pedestrians, among other forms of transportation. Each MPO is required to prepare a Sustainable Communities Strategy (SCS) which sets forth forecast development patterns and describes the transportation system that achieve the regional GHG emission reduction targets set by CARB.

CARB's 2010 targets called for the Southern California Association of Governments (SCAG) region, the MPO in which Moreno Valley is located, to reduce per capita emissions by 8 percent by 2020 and 13 percent by 2035 based on a 2005 baseline. New targets were adopted in 2018, increasing SCAG's 2035 per capita emissions reduction target to 19 percent. SCAG adopted its own RTP/SCS in April 2012. The SCS lays out how the region will meet GHG targets to reduce per capita emissions 9 percent by 2020 and 16 percent by 2035 based on a 2005 baseline. In April 2016, SCAG adopted targets of 8 percent, 18 percent, and 21 percent reduction per capita GHG emissions by 2020, 2035, and 2040, respectively, based on a 2005 baseline. As the SCS is focused on passenger vehicle emissions on a regional scale, it is considered separate from the reductions outlined in this CAP.

Governor's Executive Order S-1-07 (Low Carbon Fuel Standard)

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS), requires a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The LCFS requires oil refineries and distributors to ensure that the mix of fuel sold in California meets this reduction. The reduction comes from production cycle (upstream) emissions from the production and distribution of transport fuels within the state, rather than the combustion cycle (tailpipe) emissions from the use of those transport fuels.⁷

Governor's Executive Order S-1-07 (Low Carbon Fuel Standard)

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS), requires a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020.

Renewable Portfolio Standards

California's Renewable Portfolio Standard (RPS), established in 2002 by the California State Senate in SB 1078, accelerated in 2006 and expanded in 2011, is one of the most ambitious renewable energy standards in the country. The RPS requires each energy provider to supply 33 percent of their electricity from eligible renewable energy resources by 2020. Signed in October 2015, SB 350 requires

⁷ EMFAC2014 Volume III - Technical Documentation

1: INTRODUCTION

providers to supply 50 percent of their electricity from eligible renewable energy resources by 2030.

Pavley Fuel Economy Standards (AB 1493)

In 2009, CARB adopted amendments to the Pavley regulations to reduce GHG emissions in new passenger vehicles from 2009 to 2016. The standards became the model for the updated federal CAFE standards.

Advanced Clean Cars (ACC) Program

In 2012, CARB adopted the ACC program, developed in coordination with the EPA. The components of the ACC program are the Low-Emission Vehicle (LEV) regulations that reduce GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle regulation, which requires manufacturers to produce an increasing number of battery electric and fuel cell electric vehicles, with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years.

Title 24 Building Standards & CALGreen

Title 24 is California's Building Energy Code, which is updated every three years. In 2010, Title 24 was updated to include the "California Green Building Standards Code," referred to as CALGreen. CALGreen requires that new buildings reduce water consumption, increase system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. CALGreen has mandatory measures that apply to nonresidential and residential construction. The most recent 2019 CALGreen code became effective in 2020. A notable change under this update is the requirement for installation of solar photovoltaics on all new residential buildings. CALGreen contains voluntary Tier 1 and Tier 2 levels, which are designed to exceed energy efficiency and other standards by 15 percent or 30 percent.

75 Percent Solid Waste Diversion

In 2011, AB 341 set the goal 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. This goal was an update to the former goal of 50 percent waste diversion set by AB 939.

100 Percent Clean Energy Act

The 100 Percent Clean Energy Act of 2018 (Senate Bill 100, or SB 100) sets a state policy that eligible renewable energy and zero-carbon resources supply 100 percent of all retail sales of electricity in California by 2045. SB 100 accelerates California's RPS established under SB 350. In recognition that California retail sellers are well on their way to achieving the target in advance of the existing deadlines,

SB 100 requires providers to supply 50 percent of their electricity from eligible renewable energy resources by 2026 and 60 percent by 2030.

1.5 Regional and Local Emissions Reduction Strategies

Several regional and local emissions reduction strategies and plans have been adopted to reduce GHG emissions in Southern California.

Regional Strategies

SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

On April 7, 2016, the Southern California Association of Governments (SCAG) adopted the 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS or Plan). The Plan is a long-range visioning plan that balances future mobility and housing needs with economic, environmental and public health goals. The plan details how the region will address its transportation and land use challenges and opportunities in order to achieve its regional emissions standards and greenhouse gas (GHG) reduction targets. It outlines more than \$556.5 billion in transportation system investments through 2040. The RTP/SCS utilizes the California Air Resources Board-established per capita GHG emission reduction targets from automobiles and light trucks for the SCAG region of 8 percent below 2005 per capita emissions levels by 2020 and 19 percent below 2005 per capita emissions levels by 2035.

Connect SoCal is the 2020 – 2045 RTP/SCS adopted in September 2020 by the Southern California Association of Governments (SCAG), which includes the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura. The Connect SoCal plan represents the vision for Southern California's future, including policies, strategies, and projects for advancing the region's mobility, economy, and sustainability through 2040. Connect SoCal utilizes the same CARB-established per capita GHG emission reduction targets for automobiles and light trucks.

SCAG Regional Climate Adaptation Framework

SCAG is developing, but as of March 2021 has not yet adopted, a Regional Climate Adaptation Framework to assist local and regional jurisdictions in managing the negative impacts of climate change. As part of the overall Framework, SCAG developed two tools for local jurisdictions in October 2020. The Communication & Outreach Strategies and Templates were developed to help jurisdictions and community-based organizations engage with residents to understand better how climate related hazards are affecting community members. SCAG also developed the Southern California Climate Adaptation Planning Guide as a resource for local planning that describes the range of climate change hazards the SCAG region is likely to face in the coming decades and outlines a general process of adaptation planning that can be applied by any member agency.

1: INTRODUCTION

WRCOG Subregional Climate Action Plan

In 2014, the Western Riverside Council of Governments (WRCOG) completed a Subregional Climate Action Plan (CAP), branded as CAPtivate, that recommends strategies to reduce greenhouse gas emissions. CAPtivate also included a study on Climate Adaptation and Resiliency, and a Model Book to assist with implementation of recommended CAP measures. The CAP established subregional emissions reduction targets of 15 percent below 2010 levels by 2020, and 49 percent below 2010 levels by 2035. WRCOG is currently preparing an update and expansion to the CAP, which will include a comprehensive update to GHG inventories and GHG emissions reduction strategies for all sectors and will establish GHG targets for the years 2030 and 2050 for all WRCOG member jurisdictions. It is anticipated that the CAP Update will be complete by June 2021.

Resilient IE

WRCOG, in coordination with the San Bernardino County Transportation Commission (SBCTA), has developed a Regional Adaptation Toolkit for Transportation Infrastructure, known as "Resilient IE", to support regional efforts to prepare for and mitigate risks associated with climate adaptation and transportation infrastructure.

Riverside County Climate Action Plan

In 2019, Riverside County adopted the 2019 Climate Action Plan (CAP) Update. The 2019 CAP Update refines the County's efforts to meet greenhouse gas (GHG) reduction strategies, specifically for the years 2035 and 2050. The 2019 CAP Update builds upon the GHG reduction strategies in the 2015 Climate Action Plan. The 2019 CAP applies to Unincorporated Riverside County.

Local

Moreno Valley Energy Efficiency and Climate Action Strategy

On October 9, 2012, the Moreno Valley City Council approved the Energy Efficiency and Climate Action Strategy and the related Greenhouse Gas Analysis. The Strategy and Analysis documents identify potential programs and policies to reduce overall City energy consumption and increase the use of renewable energy. The Strategy also prioritizes implementation of programs, policies, and projects based upon energy efficiency, cost efficiency and potential resources. The Greenhouse Gas Analysis provides a more scientific approach and recommends a target to reducing community-wide GHG emissions consistent with the State reduction goals in Assembly Bill (AB) 32, the legislation that provides the basis of the State's climate action initiatives.

Moreno Valley Bicycle Master Plan

Adopted in 2015, the Moreno Valley Bicycle Master Plan specifically recommends programs and policies designed to make the Moreno Valley a more bicycle friendly place and to encourage more residents to ride rather than drive. As part of the bicycle master plan, Moreno Valley is focused on improving access to local and regional transit opportunities in the community as the City looks to contribute its fair share towards regional goals for reducing vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions.

Moreno Valley Electric Utility Integrated Resource Plan and Transportation Electrification Roadmap

Adopted in 2018, the Power Integrated Resource Plan (IRP) is Moreno Valley Utility's (MVU) 20-year blueprint for ensuring reliable and environmentally-responsible energy at affordable rates. This IRP identifies a diverse and balanced portfolio of resources needed to ensure that MVU has reliable electricity supply that provides optimal integration of renewable energy in a cost-effective manner. The IRP is intended to ensure that MVU meets, by 2030, its share of the California greenhouse gas (GHG) emissions reduction target established by the California Air Resources Board (CARB).

MVU is currently developing a strategic plan that will provide a roadmap to carry the utility forward for the next several years. The strategic plan will address many of the opportunities facing MVU that require direction and input from the City Council and Utilities Commission, including steps to promote and guide transportation electrification in its territory and surrounding areas.

1.6 Planning Process

How This Plan Was Prepared

The CAP reflects the City's commitment to the core values presented in the General Plan, and links elements of the plan—including Land Use and Community Character, Transportation, Safety, Environmental Justice, Healthy Community, and Open Space Resource Conservation—with the goal of GHG reduction. The CAP was prepared in 2020-21, in conjunction with the General Plan 2040 update.

1: INTRODUCTION

Relationship to the California Environmental Quality Act

The California Environmental Quality Act (CEQA) is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. In 2007, California's lawmakers enacted SB 97, which expressly recognizes the need to analyze GHG emissions as part of the CEQA process. SB 97 required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to address GHG emissions as an environmental effect.

In 2010, OPR's amendments to the CEQA guidelines addressing GHG emissions became effective. Lead agencies are now obligated to describe, calculate or estimate the amount of GHG emissions resulting from a project, by using a model or methodology to quantify GHG emissions resulting from a project or relying on a qualitative analysis or performance based standards. The lead agency should determine whether a project's GHG emissions significantly affect the environment by considering whether the project's emissions, as compared to the existing environmental setting, exceeds a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with the regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. In addition, the lead agency is required to impose feasible mitigation to eliminate or substantially reduce significant effects.

In December 2018, OPR and the California Natural Resources Agency's amendments to the CEQA guidelines, including changes to CEQA Guidelines section 15064.4, became effective. The revision of CEQA Guidelines section 15064.4 clarified several points on the analysis of greenhouse gas emissions. Lead agencies must analyze the greenhouse gas emissions of proposed projects and its effect on climate change, rather than simply quantifying emissions. The lead agency should consider the global and cumulative nature of greenhouse gas emissions and may consider a projects consistency with the State's long-term climate goals or strategies. In addition, the lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The 2019 CEQA Guidelines also implement Senate Bill (SB) 743 traffic impact analysis, including guidance on Vehicle Miles Traveled (VMT) screening thresholds, mitigation, and reduction. Using VMT to measure transportation impacts promotes the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses in accordance with SB 743.

The CAP will help the City comply with CEQA Guidelines Section 15183.5(b): Tiering and Streamlining the Analysis of Greenhouse Gas Emissions⁸, which became effective in 2010. The required elements of a CAP, as cited in the guidelines, state that a plan for the reduction of GHG emissions should:

- ❖ Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- ❖ Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- ❖ Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- ❖ 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;
- ❖ 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; and
- ❖ Be adopted in a public process following environmental review.

The CAP is intended to fulfill these requirements. The CAP also contains a Project Review Checklist, which allows for streamlined review of GHG emissions for projects that demonstrate consistency with the CAP, as described in CEQA Guidelines Section 15183.5(b).

Relationship to General Plan and Future Projects

The City's approach to addressing GHG emissions within the General Plan is parallel to the climate change planning process followed by numerous California jurisdictions. A General Plan is a project under CEQA, and projects under CEQA are required to estimate CO₂ and other GHG emissions, as described above. The CAP is designed to provide discrete actions to operationalize the General Plan policies that help with GHG reduction. The preparation of a CAP is also consistent with CEQA Guidelines Section 15183.5 that allows jurisdictions to analyze and

⁸ 15183.5(b) of CEQA Guidelines states, "Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas 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."

1: INTRODUCTION

mitigate the significant effects of GHG at a programmatic level, by adopting a plan to reduce GHG emissions.

Project-specific environmental documents prepared for projects consistent with the General Plan may rely on the programmatic analysis contained in the CAP and the EIR certified for the Moreno Valley General Plan.

1.7 How to Use This Plan

The CAP is intended to be a tool for policy makers, businesses, community members and others to guide actions that limit Moreno Valley's GHG emissions. Ensuring that the CAP translates from policy language to on-the-ground results is critical to its success. Chapter 5 describes how the City can monitor progress in reducing emissions, and periodically revisit assumptions and key provisions of the plan. This chapter also outlines GHG emission reduction policies the City can implement if it wishes to reduce its emissions beyond the State-mandated targets.

2

Emissions Inventory

This chapter identifies the major sources and the overall magnitude of greenhouse gas (GHG) emissions in Moreno Valley, pursuant to Sections 15183.5(b)(1)(A) and 15183.5(b)(1)(C) of the state CEQA Guidelines. As part of the Climate Action Plan (CAP) preparation effort, this GHG inventory was prepared to provide a recent measure of emissions and is summarized in this chapter. This GHG inventory is prepared for the year 2018, which is the baseline year for existing land use buildout and vehicle miles traveled.

The inventory follows the standards developed by the International Council for Local Environmental Initiatives (ICLEI) for community GHG inventories.⁹ The inventory methodology is described first, followed by the inputs, and results.

2.1 Methodology

The emissions inventory covers direct GHG emissions from sources within the boundaries of Moreno Valley, including fuel combusted and solid waste generated within the city. Indirect emissions associated with the consumption of energy that is generated outside the borders of the city (such as electricity, with no end point emissions) are also included. The emissions inventory is calculated for the year 2018, which is the baseline year for existing land use buildout and vehicle miles traveled. The emissions inventory also uses data from 2019, the most recent year for which all data was available.

⁹ According to the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.1.

2. EMISSIONS INVENTORY

The emissions inventory tallies emissions from ten sectors:

- ❖ Residential;
- ❖ Commercial;
- ❖ Industrial;
- ❖ Transportation;
- ❖ Solid Waste;
- ❖ Water;
- ❖ Wastewater;
- ❖ Agriculture;
- ❖ Off-Road Equipment; and
- ❖ Public Lighting.

ICLEI US Community Protocol assumptions were used to estimate emissions from solid waste disposal, process and fugitive emissions from wastewater treatment, and residential, commercial, industrial, and wastewater treatment natural gas use. The California Air Resources Board's (CARB's) EMFAC2014 model was used to calculate transportation emissions, and CARB's OFFROAD model was used for the off-road equipment sector.

The majority of emissions were calculated using activity data and emissions factors. Activity data refers to a measurement of energy use or another GHG-generation process, such as residential electricity use, or vehicle miles traveled. Emissions factors are used to convert activity data to emissions, and are usually expressed as emissions per unit of activity data (e.g. metric tons carbon dioxide [CO₂] per kilowatt hour of electricity). To estimate emissions, the following basic equation is used:

$$[Activity\ Data] \times [Emissions\ Factor] = Emissions$$

As an example, multiplying the total amount of residential electricity use (activity data, expressed in kilowatt-hours) by the emissions factor (expressed as CO₂e emissions per kilowatt-hour) produces the emissions in CO₂e from residential energy use. The following section describes the inputs for the emissions inventory based on activity data (or usage). As noted above, the baseline year for the inventory is 2018, which is the earliest year for which all activity data was available.

For transportation trips that originate or end in Moreno Valley, emissions for half of the entire trip, not just for the miles traveled within Moreno Valley, are included, consistent with ICLEI guidance; however, trips that just pass through the Moreno Valley are excluded, as their emissions would be reflected at their trip ends. Furthermore, although pass-through trips contribute a substantial amount to VMT totals, the City and the Moreno Valley community have limited ability to influence them.

2.2 Emissions Inventory

Residential, Commercial, and Industrial (RCI) Electricity and Natural Gas Usage

Emissions from electricity consumption were calculated using electricity usage for the residential, commercial, and industrial (RCI) sectors along with Southern California Edison's (SCE's) 2018 GHG per unit of electricity provided in Edison International's 2019 Corporate Responsibility Report: 0.23 metric tons CO₂e per megawatt-hour (MTCO₂e/MWh). Southern California Edison provided electricity usage for the commercial and residential sectors for year 2019. Agricultural and industrial electricity usage was estimated from Southern California Edison's Quarterly Customer Data Reports for 2019, which provide high level data aggregated by zip code and sector that cannot be linked to an individual customer. Moreno Valley Utility provided 2019 electricity usage for the following rate categories: residential, small commercial, large commercial, industrial (manufacturing), city accounts, pumping and agriculture, streetlights, and traffic signals.

Emissions from natural gas consumption were calculated using natural gas usage for the RCI sectors, along with emissions factors provided in Appendix C of the ICLEI Protocol for the RCI sectors: 0.0053 metric tons CO₂e per therm (MTCO₂e/therm). Southern California Gas Company provided 2019 natural gas usage for the following rate categories: commercial, industrial, single-family residential, and multi-family residential.

Table 1 shows RCI electricity and natural gas consumption, and the total citywide consumption of electricity and natural gas, for 2019. The residential sector has the largest electricity and natural gas consumption (primarily used for heating homes and water), followed by commercial and industrial.

TABLE 2-1: RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL (RCI) INPUTS		
		Inputs
Residential	Electric (kWh per year)	391,975,510
	Natural Gas (therms per year)	21,934,767
Commercial	Electric (kWh per year)	302,328,359
	Natural Gas (therms per year)	5,885,682
Industrial	Electric (kWh per year)	99,775,374
	Natural Gas (therms per year)	41,302
Total by Source		
Electricity (kWh per year)		794,079,243
Natural Gas (therms per year)		27,861,751

Source: Southern California Edison, 2020; Moreno Valley Utility, 2020; Southern California Gas Company, 2020.

2. EMISSIONS INVENTORY

Agriculture

Emissions from agricultural sources were calculated using electricity usage for the agricultural sector along with Southern California Edison's (SCE's) 2018 GHG per unit of electricity provided in Edison International's 2019 Corporate Responsibility Report: 0.23 metric tons CO₂e per megawatt-hour (MTCO₂e/MWh). Agricultural electricity usage was estimated from Southern California Edison's Quarterly Customer Data Reports for 2019, which provide high level data aggregated by zip code and sector that cannot be linked to an individual customer. This was added to electricity usage data for pumping and agriculture provided by Moreno Valley Utility. SoCal Gas did not provide natural gas usage data for the agriculture sector.

Transportation

Transportation emissions are based on vehicle miles traveled (VMT) for on-road vehicles. The SCAG model consistent with the 2016 SCAG RTP/SCS growth projections was used to estimate the VMT generated by land uses in Moreno Valley. To assess the VMT generated in Moreno Valley, the production and attraction (PA) method was used which records all home-based production and home-based-work production and attraction vehicular trips generated by land uses in Moreno Valley across the entire regional network. The total annual VMT in 2018 was 3,144,986 vehicle miles traveled. VMT is adjusted to halve trip VMT for trips that begin in the Planning Area but end outside the Planning Area or those that begin outside but end inside.

EMFAC2021 was used to find CO₂ emission factors (emissions per VMT) for vehicles in the portion of Riverside County within the South Coast Air Basin (SCAB). The emission factors were found for calendar year 2018; annual emissions (no season was chosen); and all model years, speeds, and fuels. Emissions were calculated by multiplying emission factors by VMT and by 347 days.

Off-Road Equipment

Off-road emissions in Moreno Valley include lawn and garden equipment, construction equipment, and industrial equipment, in addition to other categories for which EMFAC model generates emission outputs. The model generates emissions for a total of 16 categories across Riverside County. The CO₂ emissions were calculated in short tons per day for the portion of the county that lies in SCAB. The emissions were found for calendar year 2018; Monday through Sunday; annual emissions (no season was chosen); and all equipment, fuels, and horsepower. These emissions were then pro-rated by Moreno Valley's share of the county population within SCAB, multiplied by 365 days, and converted to metric tons.

Solid Waste

Emissions from disposal of solid waste were calculated using the total organic commercial, residential, and other solid waste disposed of in landfills in 2019 provided by Waste Management (City of Moreno Valley) and Riverside County Department of Waste Resources. 92,471 tons of commercial waste, 34,706 tons of residential waste, and 30,907 tons of waste from other sources including roll-off and construction waste were generated and disposed of within Moreno Valley. These data were multiplied by emissions factors used in the EPA's Waste Reduction Model (WARM). In 2019, Moreno Valley diverted 7.6 percent of commercial waste, 35.8 percent of residential waste, and 35.6 percent of roll-off waste.

Water

Emissions from supplying water were calculated using the 2019 electricity and natural gas consumption provided by Eastern Municipal Water District (EMWD) and Box Springs Mutual Water Company for potable and reclaimed water: 4,651,580 kWh and 199,577 therms, respectively. Box Springs does not use natural gas in water management and delivery. In 2019, EMWD supplied 11,112.47 million gallons of water and Box Springs supplied 74.104 million gallons to the City of Moreno Valley.

Wastewater Treatment

Emissions from wastewater treatment were calculated using the 2019 electricity and natural gas consumption provided by EMWD for the management of wastewater: 9,441,777 kWh and 419,096 therms, respectively. In 2019, EMWD managed 13,793.26 million gallons of wastewater generated by the City of Moreno Valley.

Edgemont Community Services District (ECSD) also provides wastewater treatment services to Moreno Valley. However, ECSD owns and maintains an all gravity sewer collection system and therefore does not consume any electricity or natural gas in the maintenance and operation of its system. All of the effluent from the District's system runs into the City of Riverside collection system. From there, it enters the treatment plant maintained by the City of Riverside. In 2019, the ECSD managed 195.88 million gallons of wastewater generated by the City of Moreno Valley. Given the nature of ECSD's sewer collection system, emissions associated with this source are not included in the baseline emissions analysis.

Public Lighting

Emissions from public lighting were calculated using electricity usage for street lights and traffic signals in Moreno Valley. Moreno Valley Utility provided 2019 electricity consumption data: 1,206,720 kWh from street lights and 189,099 kWh from traffic signals. Additionally, Southern California Edison provided that 4,686,354 kWh was used in 2019 to power street lights.

2. EMISSIONS INVENTORY

Total Emissions

The total GHG emissions were 866,410 MTCO₂e per year in 2018. Table 2-2 summarizes the sources and quantities of emissions, and Figure 2-1 shows the emissions graphically by sector. The largest sector is transportation, at 56 percent, followed by residential (24 percent) and commercial (12 percent).

Figure 2-1: 2018 GHG Emissions by Sector

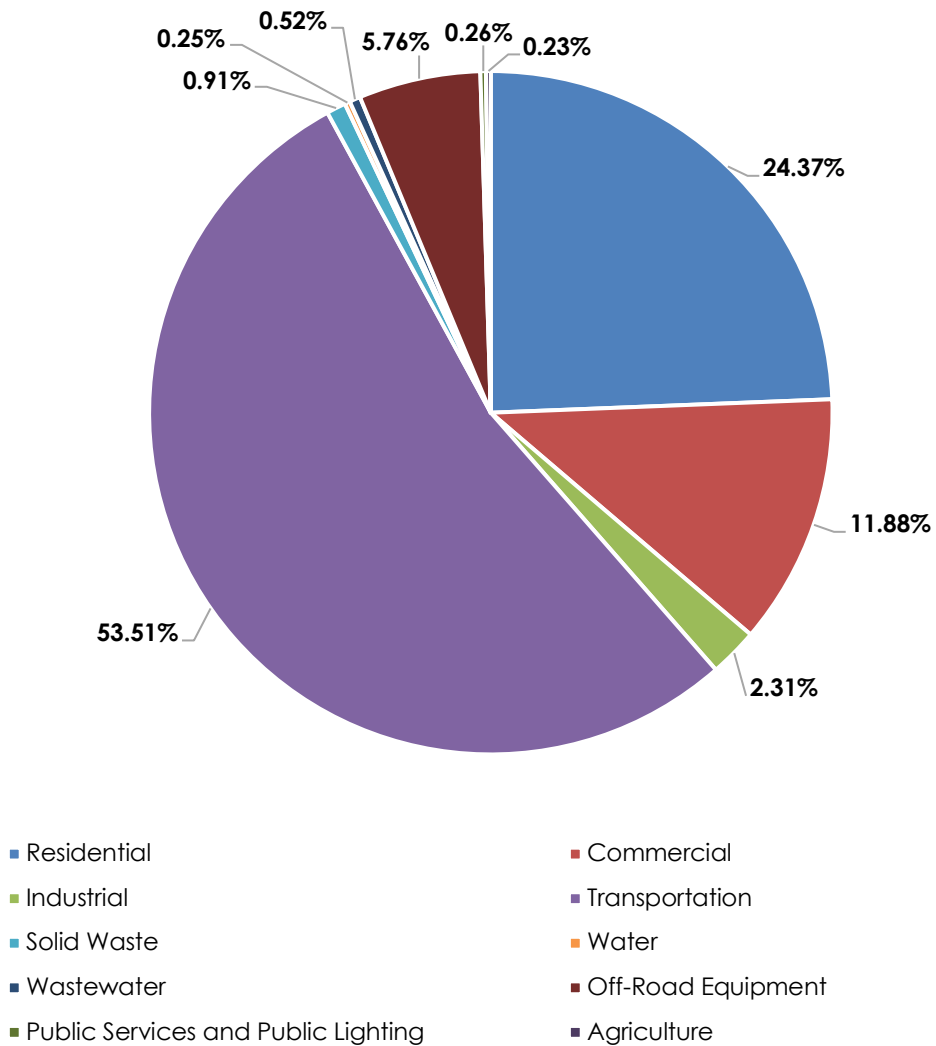


TABLE 2-2: 2018 GHG EMISSIONS (MTCO₂E PER YEAR)		
Sector	Subsector	Emissions
Residential	Electricity	90,154
	Natural Gas	116,635
	Total Residential	206,790
Commercial	Electricity	69,536
	Natural Gas	31,230
	Total Commercial	100,766
Industrial	Electricity	19,370
	Natural Gas	219
	Total Industrial	19,589
Transportation	Gasoline	373,504
	Diesel	109,599
	Total Transportation	483,063
Solid Waste	Residential	1,259
	Commercial	3,354
	Construction/Other	3,124
	Total Solid Waste	7,737
Water	Total Water	2,129
Wastewater	Total Wastewater	4,395
Agriculture	Total Agriculture	1,938
Off-Road Equipment	Total Off-Road	37,784
Public Lighting	Total Public Lighting	2,219
GRAND TOTAL		866,410

Source: Dyett & Bhatia, 2021.

2. EMISSIONS INVENTORY

RCI Emissions by Source

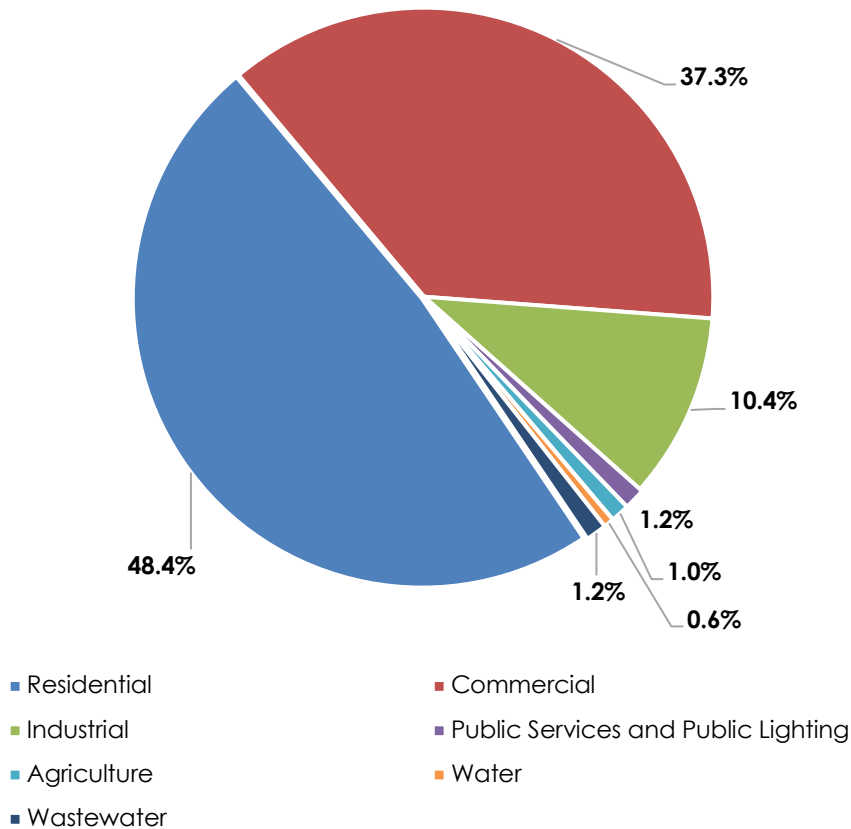
Electricity

RCI electricity emissions account for 20.6 percent of the total emissions. Table 2-3 and Figure 2-2 show electricity use emissions by sector—the residential sector accounts for 48.4 percent of all electricity emissions in Moreno Valley, followed by the commercial sector, which accounts for 37.3 percent.

TABLE 2-3: ELECTRICITY EMISSIONS BY SECTOR (MTCO ₂ E PER YEAR)	
Sector	2018 Emissions
Residential	206,790
Commercial	100,766
Industrial	19,589

Source: Dyett & Bhatia, 2021.

Figure 2-2: Electricity Emissions by Sector



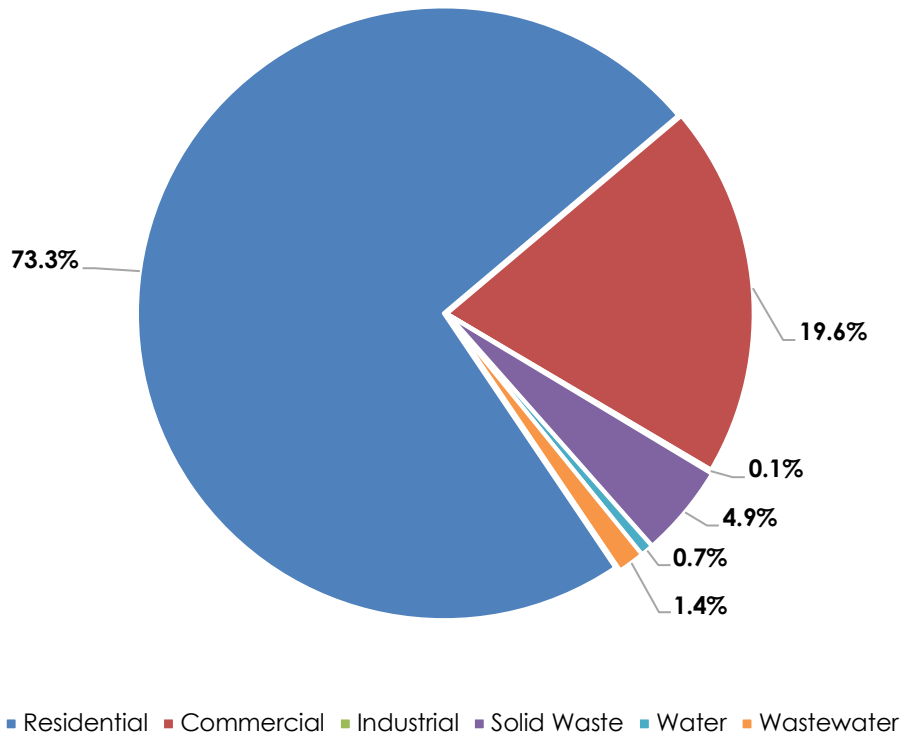
Source: Dyett and Bhatia, 2021.

Natural Gas

Natural gas use accounts for 17.4 percent of total emissions in Moreno Valley. The residential sector accounts for 77.1 percent of natural gas use, while the commercial sector accounts for 20.6 percent. Table 2-4 and Figure 2-3 show natural gas use emissions by sector.

TABLE 2-4: NATURAL GAS EMISSIONS BY SECTOR (MTCO ₂ E PER YEAR)	
Sector	2018 Emissions
Residential	116,635
Commercial	31,230
Industrial	219

Figure 2-3: Natural Gas Emissions by Sector



Source: Dyett and Bhatia, 2021.

2. EMISSIONS INVENTORY

This page intentionally left blank

3

Greenhouse Gas Reduction Targets and Forecasts

This chapter describes the greenhouse gas (GHG) reduction targets provided by State law, provides a baseline forecast of GHG emissions, and models forecasts of future GHG emissions through 2040. The chapter also quantifies GHG reductions from (1) State actions and (2) the updated General Plan policies and actions, and applies these reductions to the emissions forecast.

3.1 GHG Reduction Target

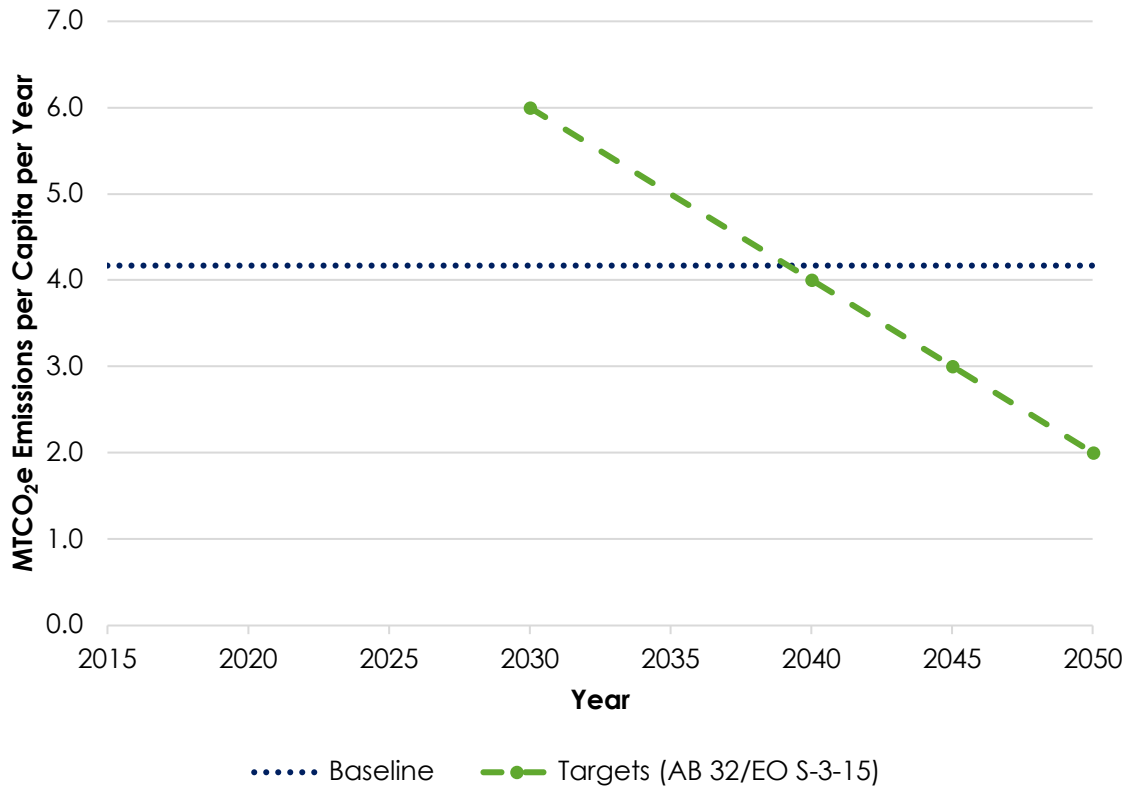
As discussed in Section 1.4 of the Introduction, the CAP will need to demonstrate compliance with the General Plan 2040 horizon year target of 4.0 MTCO₂e per capita per year (derived from Statewide targets for 2030 and 2050 per AB 32 and EO S-3-05). The 2017 California Air Resources Board (CARB) Scoping Plan provides guidance for local communities to meet AB 32 and EO S-3-05 targets.

Per CARB, local actions—such as general plans and climate action plans—are essential tools for the State to meet its GHG emission reduction goals. According to the Scoping Plan, local agencies should target total emissions of no more than six metric tons carbon dioxide equivalent (MTCO₂e) per capita per year by 2030 and no more than two MTCO₂e per capita by 2050 to be consistent with the 2017 Scoping Plan and the State's long-term goals. The GHG emission targets proposed for the Moreno Valley CAP are based on the goals established by EO S-3-15 and SB 32, following the CAP guidelines established in the 2017 Scoping Plan. The horizon year for analysis in the proposed Moreno Valley CAP is 2040, corresponding with the General Plan update horizon. The proposed 2040 target of four MTCO₂e per capita per year is determined using a linear trajectory in emissions reduction between 2030 and 2050.

3: GREENHOUSE GAS REDUCTION TARGETS AND FORECAST

Figure 3-1 graphs the 2018 inventory emissions in MTCO₂e per capita along with the emissions target, following a linear trajectory, from 2030 to 2050. As can be seen, the 2018 emissions exceed the 2050 target but meet the 2030 target. However, increased development under the General Plan Update could generate increased emissions.

Figure 3-1: Comparison of 2018 Emissions to GHG Reduction Targets



Source: Dyett and Bhatia, 2021.

3.2 Business as Usual Forecast

Methodology

The business as usual (BAU) forecast estimates emissions through the year 2040. The BAU forecast assumes the 2006 General Plan land use and circulation system, as amended through 2018. business as usual (BAU) forecast estimates emissions through the year 2040 and includes the effects of the State Renewable Portfolio Standard (RPS) and the 2019 Title 24 Building Energy Efficiency Standards. The forecast accounts for the goal of 75 percent diversion of solid waste by 2020 per AB 341. Pavley regulations and the Advanced Clean Cars program are already accounted for in the transportation emission factors output by the EMFAC2021 model, so these are automatically included in the BAU forecast. Conversely, the Low Carbon Fuel Standard (LCFS) is not included in the EMFAC2014 model

because LCFS GHG reductions come from upstream emissions, rather than tailpipe emissions, as discussed in the EMFAC2021 Technical Documentation.

The forecast predicts all direct GHG emissions from sources within the boundaries of Moreno Valley, including fuel combusted in the city. Indirect emissions associated with the consumption of energy that is generated outside the borders of the city are also included. Other indirect or embodied emissions are not covered in the forecast, in accordance with International Council for Local Environmental Initiatives standards. The emissions inventory tallies emissions from ten sectors:

- ❖ Residential;
- ❖ Commercial;
- ❖ Industrial;
- ❖ Transportation;
- ❖ Solid Waste;
- ❖ Water;
- ❖ Wastewater;
- ❖ Agriculture;
- ❖ Off-Road Equipment; and
- ❖ Public Lighting.

The emissions projected in the forecast use the activity data (or usage) from the 2018 emissions inventory as an initial value. The predicted growth in each sector is projected to scale with various Moreno Valley characteristics, such as population growth and increase in commercial building square footage. The following section describes how the predicted growth in each section was determined.

Residential

Emissions from the residential sector are from electricity and natural gas demand. The growth in residential electricity and natural gas consumption was assumed to scale with housing unit growth. This is estimated at 1.5 percent per year through 2040, based on 2040 buildout of the 2006 General Plan land use map, as amended through 2018.

Commercial

The increase in commercial demand for electricity and natural gas was assumed to scale with the commercial building square footage growth. This is estimated at 2.9 percent per year through 2040, based on 2040 buildout of the 2006 General Plan land use map, as amended through 2018.

3: GREENHOUSE GAS REDUCTION TARGETS AND FORECAST

Industrial

The increase in industrial demand for electricity and natural gas was assumed to scale with the commercial building square footage growth. This is estimated at 12.1 percent per year through 2040, based on 2040 buildout of the 2006 General Plan land use map, as amended and assuming construction of World Logistics Center (WLC) at 40.6 million square feet.

Industrial emissions also include 57,649 MTCO₂e associated with construction and operation of the WLC as calculated in Table 4.7-4 of the WLC Draft EIR from the following emissions sources: construction, yard trucks, generator, forklifts, electricity, natural gas, refrigerants, land use change.

Agriculture

Agricultural emissions were assumed to remain the same between 2016 and 2040, as agricultural acreage would not increase under the Business as Usual scenario.

Transportation

Transportation emissions are based on the emissions associated with VMT. The SCAG model consistent with the 2016 SCAG RTP/SCS growth projections was used to estimate the VMT generated by land uses in the Planning Area. To assess the VMT generated in Moreno Valley, the production and attraction (PA) method was used which records all home-based production and home-based-work production and attraction vehicular trips generated by land uses in the Planning Area across the entire regional network. The adjusted total annual VMT in 2040 under the Business as Usual scenario is projected to be 4,566,084 vehicle miles traveled. Total VMT and transportation emissions assume full operation of the WLC.

EMFAC2021 was used to find CO₂ emission factors for calendar year 2040. The United States Environmental Protection Agency's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014 was used to find national CH₄ and N₂O emission factors. Emissions were calculated by multiplying emission factors by VMT.

Off-Road Equipment

EMFAC2021 was used to generate emission outputs for calendar year 2040. These emissions were then pro-rated by Moreno Valley's share of the county population within SCAB, multiplied by 365 days, and converted to metric tons.

Solid Waste

Waste emissions from solid waste generated in Moreno Valley and disposed of in landfills, was assumed to scale with population growth at 0.96 percent per year through 2040 based on buildout of the 2006 General Plan map, as amended through 2018.

Waste emissions also include 19,359 MTCO₂e associated with waste generated by the WLC as calculated in Table 4.7-4 of the WLC Draft EIR.

Water

The increased demand for electricity usage for supplying reclaimed and potable water was assumed to be proportional to the water demand projections for the City of Moreno Valley according to the 2015 Eastern Municipal Water District Urban Water Management Plan (UWMP). The UWMP includes the effect of conservation policies. In 2040, it is projected that EMWD will use 6,139,728 kWh of electricity and 270,471 therms of natural gas to supply 46,217 million gallons of water to Moreno Valley.

Water emissions also include 2,580 MTCO₂e associated with water consumed by the WLC as calculated in Table 4.7-4 of the WLC Draft EIR.

Wastewater

The UWMP was used to determine the growth in emissions from wastewater treatment. The demand for wastewater treatment was assumed to scale with total projected water demand listed in the UWMP. In 2040, it is projected that EMWD will use 11,668,697 kWh of electricity and 517,943 therms of natural gas to manage 17,047 million gallons of wastewater from Moreno Valley.

Public Lighting

Electricity use for public lighting, including street lights and traffic signals, was assumed to scale with population growth at 0.96 percent per year through 2040 based on buildout of the 2006 General Plan map, as amended through 2018.

Results

Table 3-2 shows the BAU emissions from the forecast for each sector—residential, commercial, industrial, transportation, agriculture, solid waste, water, wastewater, off-road equipment, and public lighting—and the total emissions. The greatest projected emissions continue to be from the transportation sector, which accounts for 36 percent of emissions in 2040. Industrial emissions are the next largest sector, with 27 percent of emissions in 2040.

3: GREENHOUSE GAS REDUCTION TARGETS AND FORECAST

TABLE 3-2: 2018 EMISSIONS AND BAU 2040 FORECAST EMISSIONS BY SECTOR (MTCO₂E PER YEAR)		
Sector	2018	2040 (BAU)
Residential	206,790	257,663
Commercial	100,766	183,539
Industrial	19,589	383,075
Transportation	483,063	514,051
Solid Waste	7,737	11,754
Water	2,129	2,602
Wastewater	4,395	5,372
Agriculture	1,938	1,938
Off-Road Equipment	37,784	50,143
Public Services and Public Lighting	2,219	1,208
TOTAL	866,410	1,411,346
PER CAPITA	4.17	5.50

Source: Dyett & Bhatia, 2021.

Figure 3-2 shows the change in modeled forecast emissions over time. Total emissions in the BAU scenario are projected to increase from 866,410 MTCO₂e per year in 2018 to 1,411,346 MTCO₂e per year in 2040 (an increase of 63 percent). The BAU scenario would result in 5.50 MTCO₂e per capita per year. This would be 1.50 MTCO₂e per capita per year above the State (interpolated) target of 4.0 MTCO₂e for that year.

3.3 2040 General Plan Forecast

Methodology

The 2040 General Plan (With Project) forecast estimates emissions through the year 2040 with adoption of the Moreno Valley General Plan Update. This forecast assumes the 2040 General Plan land use and circulation system and includes the effects of the goals, policies, and actions proposed in the 2040 General Plan, State Renewable Portfolio Standard, 2019 Title 24 Building Energy Efficiency Standards, and solid waste diversion under AB 341. Like the BAU forecast, Pavley regulations and the Advanced Clean Cars programs are already accounted for in transportation emissions and the Low Carbon Fuel Standard is not included.

The With Project forecast uses the same methodology as the BAU forecast to predict all direct GHG emissions from sources within the boundaries of Moreno Valley, and tallies emissions from the same ten sectors. The emissions projected in the forecast use the activity data (or usage) from the 2018 emissions inventory as an initial value. The predicted growth in each sector is projected to scale with various Moreno Valley characteristics associated with full buildout of the 2040 General Plan. The 2040 General Plan land use, circulation system, and policies are

designed to reduce GHG emissions by promoting sustainable measures and concentrating land uses to reduce VMT.

Results

Table 3-3 shows a side-by-side comparison of emissions from the BAU forecast and With Project forecast for each sector—residential, commercial, industrial, transportation, agriculture, solid waste, water, wastewater, off-road equipment, and public lighting—and the total emissions. Under the With Project Scenario, the greatest projected emissions continue to be from the transportation sector, which accounts for 38 percent of emissions in 2040. Industrial emissions are the next largest sector, with 24 percent of emissions in 2040.

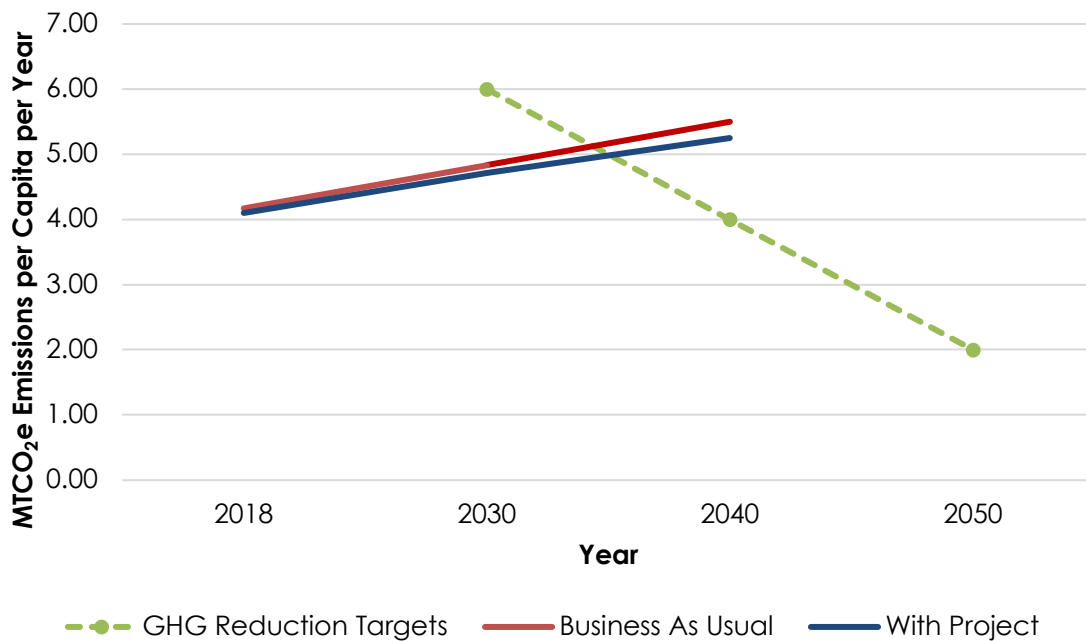
TABLE 3-2: 2018 EMISSIONS, BAU 2040 FORECAST, AND WITH PROJECT 2040 FORECAST EMISSIONS BY SECTOR (MTCO₂E PER YEAR)			
Sector	2018	2040 (BAU)	2040 (With Project)
Residential	206,790	257,663	264,683
Commercial	100,766	183,539	159,749
Industrial	19,589	383,075	320,135
Transportation	483,063	514,051	509,317
Solid Waste	7,737	11,754	10,880
Water	2,129	2,602	2,582
Wastewater	4,395	5,372	5,330
Agriculture	1,938	1,938	1,938
Off-Road Equipment	37,784	50,143	49,279
Public Services and Public Lighting	2,219	1,208	1,208
TOTAL	866,410	1,411,346	1,325,101
PER CAPITA	4.17	5.50	5.25

Source: Dyett & Bhatia, 2021.

Figure 3-2 shows the change in modeled forecast emissions over time under the BAU and With Project scenarios compared to the trajectory of emissions reduction targets identified by the State. Total emissions in the With Project scenario are projected to increase from 866,410 MTCO₂e per year in 2018 to 1,325,101 MTCO₂e per year in 2040 (an increase of 53 percent). The With Project scenario would result in 5.25 MTCO₂e per capita per year. This would be 1.25 MTCO₂e per capita per year above the State (interpolated) target of 4.0 MTCO₂e for that year.

3: GREENHOUSE GAS REDUCTION TARGETS AND FORECAST

Figure 3-2: Comparison of 2040 Emissions to GHG Reduction Targets



Source: Dyett and Bhatia, 2021.

Conclusion

Moreno Valley would exceed the 2040 emissions target of 4.0 MTCO₂e per capita per year under both the BAU and With Project scenarios by 1.50 MTCO₂e and 1.25 MTCO₂e, respectively. The With Project scenario would result in slightly lower total emissions in 2040 than the Business As Usual scenario, as shown in Table 3-2 and Figure 3-2. Assuming full buildout under the General Plan 2040, Moreno Valley would need to reduce emissions by 316,385 MTCO₂e or 23.9 percent in order to achieve the 2040 emissions target and be consistent with the 2017 Scoping Plan and Statewide goals. Despite the synergistic land use and transportation planning and the goals, policies, and actions proposed in the 2040 General Plan, Moreno Valley will need to implement additional measures through the CAP that are targeted at reducing emissions from key sectors beyond those included in the General Plan 2040 to be consistent with Statewide goals. Doing so would enable the City to meet the standards outlined in California's 2017 Scoping Plan, EO S-3-05, and EO S-3-15, and would ensure that implementation of projects consistent with the General Plan would not require additional GHG analysis in accordance with CEQA.

4

CAP GHG Reduction Measures

The With Project forecast emissions in Chapter 3 incorporate reductions from state and federal policies and General Plan 2040 land use and circulation. This chapter describes additional GHG reduction measures to close the emissions “gap” between emissions targets and forecast emissions for 2040. These measures are designed to reduce emissions in the following sectors and are organized by effectiveness in reducing overall emissions:

- ❖ Transportation;
- ❖ Industrial;
- ❖ Residential;
- ❖ Commercial;
- ❖ Off-Road Equipment;
- ❖ Public Services and Public Lighting; and
- ❖ Natural Resources.

The sections below describe the GHG reduction measures and identify the potential GHG emissions reduction in 2040. The GHG reductions from these measures were quantified using effectiveness ranges identified in the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures and other relevant literature (see Appendix B). The following chapter describes funding sources, responsibility, and implementation of each measure in Table 5-2. Overall benefits of GHG emissions reductions include decreased costs through energy efficiency, reduced risk to human health and welfare, and less global climate change.

The GHG reduction mitigation measures identified in this chapter are expected to achieve the targeted emission reductions. However, the nature, location, timing, size and other characteristics of future development projects may vary widely and additional project-level mitigation measures may be helpful or necessary to assist individual projects to achieve the targeted reductions. Accordingly, Appendix C to this Climate Action Plan provides a non-exclusive list of mitigation measures to be considered by the City and project applicants during project-level

4: CAP GHG REDUCTION MEASURES

environmental review and adopted as needed to ensure that individual development projects achieve the targeted emission reductions.

4.1 Transportation

The With Project emissions forecast incorporates synergistic land use and transportation planning included in the Moreno Valley General Plan 2040. Transportation would generate 509,317 MTCO₂e in 2040, compared to 483,063 MTCO₂e under existing conditions. Transportation is projected to generate the greatest amount of GHG emissions in 2040 (38 percent), and therefore has the most emissions reduction potential from implementation of CAP measures. The following measures identify opportunities to reduce emissions through transportation to schools, Transportation Demand Management strategies and programs, transit service, and electric vehicle infrastructure.

TABLE 4-1: TRANSPORTATION CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
TR-1	Partner with Moreno Valley Unified School District (MVUSD), Val Verde Unified School District (VVUSD) and Moreno Valley College to establish an online system like 511.org that links employees and guardians of students to provide carpool matching.	7.2 – 15.8% (CAPCOA)	7.2%	36,671 MTCO ₂ e
TR-2	Continue to implement a Safer Routes to School program for increased bicycle and pedestrian safety to and from schools.	7.2 – 15.8% (CAPCOA)	7.2%	36,671 MTCO ₂ e
TR-3	Establish a goal of achieving a 10 percent increase in alternative mode use by people employed in Moreno Valley, working with businesses with over 50 employees to implement on a voluntary basis Transportation Demand Management strategies and programs identified in Connect SoCal, the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), including but not limited to: implementing commuter benefit programs, promoting telecommuting and alternative work schedule options, and other financial incentives.	5.0 – 30.0% (Victoria Transport Policy Institute)	10.0%	50,932 MTCO ₂ e

TABLE 4-1: TRANSPORTATION CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
TR-4	Create a Transportation Demand Management program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	5.0 – 10.0% (Victoria Transport Policy Institute)	5.0%	25,466 MTCO ₂ e
TR-5	Implement trip reduction programs in new residential, commercial, and mixed-use developments.	5.0 – 10.0% (Victoria Transport Policy Institute)	5.0%	25,466 MTCO ₂ e
TR-6	Advocate for transit service improvements by area transit providers with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	0.3 – 20.0% (CAPCOA)	1.0%	5,093 MTCO ₂ e
TR-7	Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	0.5 – 12.7% (CAPCOA)	12.7%	64,683 MTCO ₂ e
TR-8	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	0.4 – 20.3% (CAPCOA)	1.0%	5,093 MTCO ₂ e
TR-9	Consider requiring new multi-family residential and mixed use development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TR-10	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				250,075 MTCO₂e

Sources: Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).
 Energy Conservation and Emissions Reduction Strategies. February 5, 2021. Victoria Transport Policy Institute.
<https://www.vtpi.org/tdm/tdm59.htm>. Accessed on: March 19, 2021.

4: CAP GHG REDUCTION MEASURES

4.2 Industrial

The General Plan 2040 envisions substantial growth in the industrial sector, which includes manufacturing, logistics, and distribution activities. Industrial uses would generate 320,135 MTCO₂e in 2040 (including emissions identified in the World Logistics Center Environmental Impact Report), compared to 19,589 MTCO₂e under existing conditions. The industrial sector is projected to generate 24 percent of GHG emissions in 2040, and therefore has significant emissions reduction potential from implementation of CAP measures. The following measures identify opportunities to reduce emissions through facility commissioning, energy upgrades, and innovation.

TABLE 4-2: INDUSTRIAL CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
I-1	Actively promote the use of energy-efficient building operations systems in existing and new industrial facilities with the goal of achieving a 40 percent energy reduction in 30 percent of industrial square footage citywide by 2040. Effectiveness should be confirmed through commissioning of new systems.	12.0-16.0% (0.4 x 0.3 = 0.12; Mills, E.)	12.0%	38,416 MTCO ₂ e
I-2	Promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Moreno Valley Utility (MVU), Southern California Edison (SCE)) and other private sector funding sources, with the goal of providing 25 percent of energy needs with solar in 30 percent of industrial and warehouse square footage by 2040. Examples of incentives include reduced permit fees or streamlined permit approval processes.	7.0% (0.25 x 0.3 = 0.75; CAPCOA)	7.0%	22,409 MTCO ₂ e
I-3	Work with electricity providers (e.g. MVU, SCE) to encourage large commercial and industrial facilities to participate in energy efficient upgrade programs including installation of solar PV systems and EV chargers and to establish annual targets.	0.2 – 5.5% (CAPCOA)	0.5%	1,601 MTCO ₂ e

TABLE 4-2: INDUSTRIAL CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
I-4	Develop and implement Technology Advancement Program, working with industrial, warehousing, and distribution facilities to encourage innovation, development of new emissions reduction technologies, and energy efficient/alternative fueled equipment upgrades. Provide incentives through partnerships with regional, statewide, and federal programs.	0.4 – 20.3% (CAPCOA)	1.0%	3,201 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				65,628 MTCO₂e

Sources: Building commissioning: a golden opportunity for reducing energy costs and greenhouse gas emissions in the United States. 2011. Mills, Evan. *Energy Efficiency* 4, 145–173). <https://doi.org/10.1007/s12053-011-9116-8>. Quantifying Greenhouse Gas Mitigation Measures 2010. California Air Pollution Control Officers Association (CAPCOA).

4.3 Residential

The General Plan 2040 seeks to provide a range of new housing suited to people of all ages and income levels throughout Moreno Valley, with an emphasis on increasing the diversity of housing types in the community and promoting construction of multi-family and mixed-use residential development in infill areas near employment and shopping and well-served by transit and public facilities. Under existing conditions, residential uses in the city are predominantly single-family homes and housing in total accounts for nearly 32 percent of land within the city limit. Residential uses would generate 264,683 MTCO₂e in 2040 (21 percent of GHG emissions), compared to 206,790 MTCO₂e under existing conditions. Projected residential emissions account for energy savings associated with the 2019 Building Energy Efficiency Standards (Title 24), which requires the installation of solar photovoltaic (PV) systems on all residential buildings constructed after January 1, 2020. Given that 60 percent of projected residential emissions are from natural gas, that Title 24 Standards apply mainly to new development, and that residential emissions make up 20 percent of projected 2040 emissions, there are numerous opportunities to reduce GHG emissions generated by residential development. The following strategies identify opportunities to reduce residential emissions through energy-efficient improvements, energy audits, and citywide programs.

4: CAP GHG REDUCTION MEASURES

TABLE 4-3: RESIDENTIAL CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
R-1	Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.	25.0% (NRDC)	25.0%	13,549 MTCO ₂ e
R-2	Require new construction and major remodels to install interior real-time energy smart meters in line with current utility provider (e.g. MVU, SCE) efforts.	7.0% (ACEEE)	7.0%	5,280 MTCO ₂ e
R-3	Develop and implement program to incentivize single-family residential efficiency retrofits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide by 2040.	0 – 15.0% 0.5 x 0.3 = 0.15; CAPCOA)	15.0%	3,185 MTCO ₂ e
R-4	Prioritize cap and trade funds to assist low-income homeowners achieve energy-efficient improvements and fund weatherization programs.	3.7 – 7.5% (CAPCOA)	3.7%	9,793 MTCO ₂ e
R-5	Apply for and prioritize Community Block Development Grant funds to assist low-income homeowners achieve energy-efficient improvements.	3.7 – 7.5% (CAPCOA)	3.7%	9,793 MTCO ₂ e
R-6	Develop program and funding strategy to incentivize conversion of natural gas heated homes and nonresidential buildings to electricity.	2.0 – 4.0% (CAPCOA)	2.0%	4,185 MTCO ₂ e
R-7	Develop and implement program to incentivize multi-family residential efficiency audits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction in 30 percent of the projected amount of multi-family homes citywide by 2035	0 – 15.0% 0.5 x 0.3 = 0.15; CAPCOA)	15.0%	12,955 MTCO ₂ e

TABLE 4-3: RESIDENTIAL CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
R-8	Provide a toolkit of resources, including web-based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
R-9	Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				58,742 MTCO₂e

Sources: Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California. 2021. Natural Resources Defense Council (NRDC). <https://www.nrdc.org/sites/default/files/GreenRoofsReport.pdf>
 Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. 2010. American Council for an Energy-Efficient Economy (ACEEE). <https://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>
 Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).

4.4 Commercial

The General Plan 2040 seeks to concentrate opportunities for new commercial development in mixed-use areas centrally located within the city. Commercial uses would generate 159,749 MTCO₂e in 2040 (12 percent of GHG emissions), compared to 100,766 MTCO₂e under existing conditions. Projected residential emissions account for energy savings associated with the 2019 Building Energy Efficiency Standards (Title 24), which includes improved standards for HVAC systems and indoor lighting. The following strategies address further energy efficiency improvements in new and existing commercial buildings and facilities.

4: CAP GHG REDUCTION MEASURES

TABLE 4-4: COMMERCIAL CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
C-1	Expand efforts to install energy-efficient lighting technologies in new and existing private parking lots.	0 – 68% (CAPCOA)	20.0%	21,999 MTCO ₂ e
C-2	Facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships such as expansion of utility provider (e.g. MVU, SCE, SoCal Gas) programs to reduce energy use.	5.2 – 15.0% (CAPCOA)	5.2%	8,307 MTCO ₂ e
C-3	Promote energy efficiency financing programs to medium to large sized commercial facilities.	0.4% (EPA)	0.4%	479 MTCO ₂ e
C-4	Promote Moreno Valley Utility and Southern California Edison direct install energy efficiency programs to help small businesses identify opportunities to save electricity.	0.4% (EPA)	0.4%	158 MTCO ₂ e
C-5	Actively engage with Moreno Valley businesses to identify areas for GHG reduction and financial savings.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				30,945 MTCO₂e

Sources: Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).

Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions. 2009. U.S. Environmental Protection Agency (EPA). National Action Plan For Energy Efficiency. https://www.epa.gov/sites/production/files/2015-08/documents/ee_and_carbon.pdf.

4.5 Off-Road Equipment

Sources of off-road emissions in Moreno Valley include lawn and garden equipment, construction equipment, and industrial equipment. New development associated with the General Plan could increase use of off-road equipment and therefore generate significant GHG emissions. Use of off-road equipment would generate 49,279 MTCO₂e in 2040 (4 percent of GHG emissions), compared to 37,784 MTCO₂e under existing conditions. While technology of off-road equipment is improving, the following strategies target opportunities to minimize emissions from construction and landscaping equipment, with the added benefit of improving air quality and public health.

TABLE 4-5: OFF-ROAD CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO_{2e} per year)
OR-1	<p>Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.</p> <ul style="list-style-type: none"> ○ Partner with the SCAQMD to establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers. ○ Require new buildings to provide electrical outlets in an accessible location to facilitate use of electric-powered lawn and garden equipment. ○ In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment. 	0 – 49.5% (CAPCOA)	1.0%	4,928 MTCO _{2e}
OR-2	<p>Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles.</p> <ul style="list-style-type: none"> ○ Require provision of clear signage reminding construction workers to limit idling. ○ Require project applicants to limit GHG emissions through one or more of the following measures: substitute electrified or hybrid equipment for diesel/gas powered, use alternative-fueled equipment on site, avoid use of on-site generators. 	2.5 – 22.0% (CAPCOA)	2.5%	1,232 MTCO _{2e}
TOTAL EMISSIONS REDUCTION				6,160 MTCO_{2e}

Sources: Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).

4: CAP GHG REDUCTION MEASURES

4.6 Public Services and Public Lighting

The operation of public services and public lighting in Moreno Valley would generate 1,208 MTCO₂e in 2040 (0.1 percent of GHG emissions), compared to 2,219 MTCO₂e under existing conditions. The City of Moreno Valley is dedicated to reducing GHG emissions throughout the community, including municipal sources. While municipal buildings and public lighting generate a small fraction of total emissions in the With Project 2040 inventory, there are still opportunities for the City to improve sustainability and energy efficiency.

TABLE 4-6: PUBLIC CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
PS-1	Participate in Savings by Design program to identify ways to improve the energy efficiency for all new municipal buildings and facilities. As part of the Savings By Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10%.	0.2 – 5.5% (CAPCOA)	5.5%	66 MTCO ₂ e
PS-2	Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy efficient equipment.	5.0 – 10.0% (EPA)	10.0%	121 MTCO ₂ e
PS-3	Support Moreno Valley Utility and Southern California's efforts to conduct an annual municipal energy audit to determine if energy efficient retrofits are effective in reducing emissions from City operations.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
PS-4	Utilize Energy Management tools to monitor long-term impacts of municipal efficiency projects.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				187 MTCO₂e

Sources: Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).

Energy-Efficient Product Procurement: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs. 2011. U.S. Environmental Protection Agency (EPA). <https://www.epa.gov/sites/production/files/2015-08/documents/energyefficientpurchasing.pdf>.

4.7 Natural Resources

The management of water and wastewater would generate a total of 7,912 MTCO₂e in 2040 (0.6 percent of GHG emissions), compared to 6,524 MTCO₂e under existing conditions. In Moreno Valley's arid climate, using drought-tolerant, locally adapted plants throughout the city can save thousands of gallons of water per year, reduce demand for groundwater, and save energy associated with the distribution and management of water. Planting and maintenance of trees will also help conserve water by capturing precipitation and runoff to recharge groundwater. Additionally, trees provide shade for other landscaping, reducing irrigation requirements, and provide relief from urban heat islands, protecting public health as the impacts of climate change are felt in Moreno Valley.

TABLE 4-7: NATURAL RESOURCES CAP STRATEGIES				
ID	Measure	Effectiveness Range	Assumed Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
NC-1	Require new landscaping to be climate appropriate.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
NC-2	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
NC-3	Increase and maintain urban greening in the community by maintaining Tree City USA status and promoting tree planting and urban gardening programs.	Supportive (CAPCOA)	0%	0 MTCO ₂ e
TOTAL EMISSIONS REDUCTION				0 MTCO₂e

Sources: Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA).

4: CAP GHG REDUCTION MEASURES

4.8 Modified Forecast

Table 4-1 shows a summary of the CAP GHG reduction strategies. While the individual measures may be implemented over different timescales, for the purposes of calculating their impact in this section, the full reduction potential in the year 2040 is used.

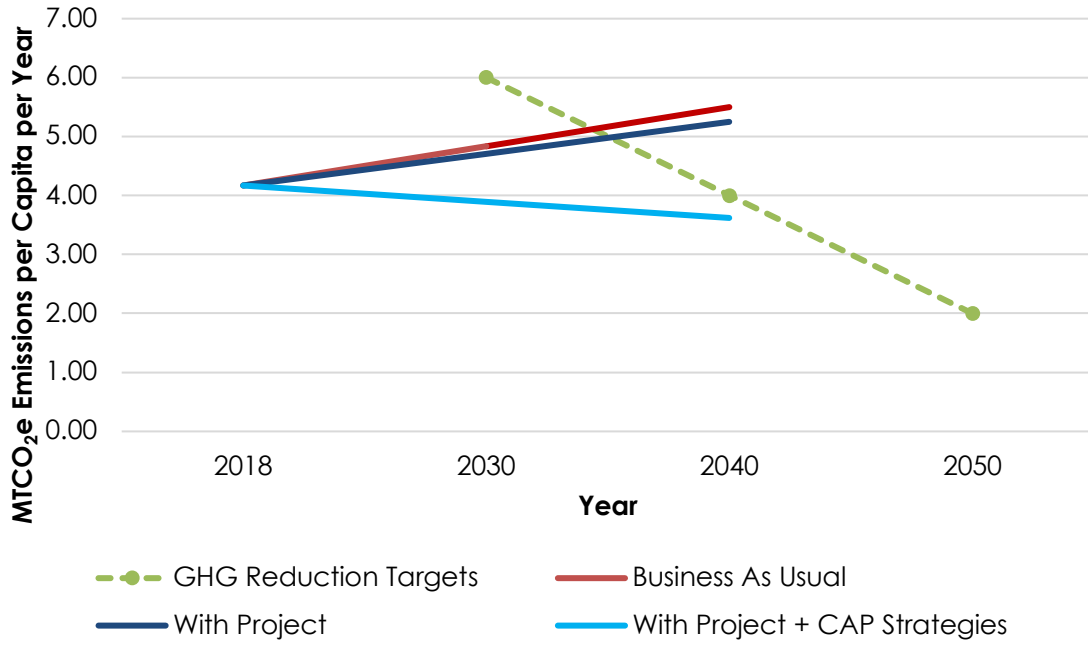
As a whole, the CAP GHG reduction strategies were designed to enable Moreno Valley to achieve its GHG reduction target in the year 2040. The combined GHG reductions from these measures is 411,743 MTCO_{2e} in 2040, which cover the emissions “gap” identified in Chapter 3. Table 4-3 adds the effect of the CAP GHG reduction measures to the 2040 With Project forecast, and compares the resulting forecast with CAP GHG reduction strategies to the BAU forecast and With Project forecast (without CAP strategies). Figure 4-1 shows the same comparison, demonstrating that implementation of this CAP will enable the City of Moreno Valley to meet the emissions target for 2040 and be consistent with Statewide reduction goals.

For this CAP to successfully be implemented, the City of Moreno Valley must play a prominent role in implementing the CAP GHG reduction measures. In addition to responsibility and implementation covered for each measure in this chapter, the following chapter discusses how the CAP will be revised and updated in the future to ensure that the targets are met.

TABLE 4-8: 2040 GHG EMISSIONS FORECAST WITH CAP STRATEGIES (MTCO_{2e} PER YEAR)				
Sector	2040 BAU Emissions	2040 With Product Emissions	Emissions Reduction from CAP Strategies	2040 With Project Emissions with CAP Strategies
Residential	257,663	264,683	58,742	205,941
Commercial	183,539	159,749	30,945	128,804
Industrial	383,075	320,135	65,628	254,507
Transportation	514,051	509,317	250,075	259,242
Solid Waste	11,754	10,880	-	10,880
Water	2,602	2,582	-	2,582
Wastewater	5,372	5,330	-	5,330
Agriculture	1,938	1,938	-	1,938
Off-Road Equipment	50,143	49,279	6,160	43,119
Public Services and Public Lighting	1,208	1,208	187	1,021
TOTAL	1,411,346	1,325,101	411,743	913,365
PER CAPITA	5.50	5.25	1.63	3.62

Source: Dyett and Bhatia, 2021.

Figure 4-1: Comparison of 2040 Emissions Forecast with CAP Strategies to GHG Reduction Targets



Source: Dyett and Bhatia, 2021.

4: CAP GHG REDUCTION MEASURES

This page intentionally left blank.

5

Implementation, Monitoring and Reporting

Chapter 4 identifies a comprehensive set of goals and specific measures and actions that the City of Moreno Valley will take in order to meet its GHG emissions target. Implementation and monitoring are key to ensuring that the City is successful in reaching those targets. The City will use an adaptive management approach to CAP implementation. Adjustments to management actions will be made as needed to support continuous improvement based on measured results, monitoring effectiveness, new technology, or in response to deficiencies in program assessment results. This chapter describes how the City of Moreno Valley will implement the CAP and monitor and report on its effectiveness, consistent with State CEQA Guidelines Sections 15183.5(b)(1)(D) and (E).

For discretionary projects seeking to use CEQA streamlining provisions, in an environmental document the City shall refer to the required measures in this CAP as mandatory conditions of approval or as mitigation. This will enable projects to benefit from CEQA streamlining provisions, while ensuring that the City can achieve the reduction targets outlined in this plan.

5.1 Monitoring Metrics and Schedule

Table 5-1 lists all of the measures identified in Chapter 4 along with the following information:

Responsible Department: The City department(s) that will be primarily responsible for implementing, monitoring, and reporting on the progress for each measure.

GHG Reduction Goal: The estimated annual emission reductions anticipated by target year 2040.

5: IMPLEMENTATION, MONITORING AND REPORTING

Progress Indicators: The types of data that will be collected to measure progress toward the performance target and correlate to GHG emissions reductions. Progress indicators will be confirmed as part of the implementation of each measure. If a recommended progress indicator is found to be infeasible to collect or track, an alternative indicator will be identified.

Implementation Timeframe: The schedule by which each action is to be implemented, beginning from the year the CAP is adopted, as follows:

Short-term – one to two years

Mid-term – two to five years

Short to Long-term, or Mid-to Long-term – actions that will begin in the short or mid-term, but take longer than five years to fully implement.

TABLE 5-1: CAP IMPLEMENTATION MATRIX

Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
TRANSPORTATION				
Partner with Moreno Valley Unified School District (MVUSD), Val Verde Unified School District (VVUSD) and Moreno Valley College to establish an online system like 511.org that links employees and guardians of students to provide carpool matching.	Planning, Public Works; MVUSD, VVUSD, Moreno Valley College	36,671 MTCO ₂ e	Establishment of online system, % participation in carpool matching	Short-term
Continue to implement a Safer Routes to School program for increased bicycle and pedestrian safety to and from schools.	Public Works	36,671 MTCO ₂ e	% of students walking or biking to school	Short-term
Encourage businesses with over 50 employees to implement Transportation Demand Management strategies and programs identified in Connect SoCal, the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), including but not limited to: implementing commuter benefit programs, promoting telecommuting and alternative work schedule options, and other financial incentives. Establish a goal of achieving a 10 percent increase in alternative mode use by workers in Moreno Valley.	Planning, Economic Development, Media	50,932 MTCO ₂ e	% participation by businesses with over 50 employees, 10% increase in alternative mode use by workers	Short to mid-term
Create a Transportation Demand Management program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	Public Works, Planning, City Manager's Office, Financial & Management Services	25,466 MTCO ₂ e	Program established, % participation by City staff	Short-term
Implement trip reduction programs in new residential, commercial, and mixed-use developments.	Planning, Building & Safety, Community Development	25,466 MTCO ₂ e	Program established, number of program participants and/or sq. footage of buildings in program	Short to long-term

5: IMPLEMENTATION, MONITORING AND REPORTING

TABLE 5-1: CAP IMPLEMENTATION MATRIX

Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
Advocate for transit service improvements by area transit providers with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	Planning, Public Works, Financial & Management Services	5,093 MTCO _{2e}	Coordinated public transit schedules, % residents and employees using transit service	Short-term
Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	Planning, Public Works, Financial & Management Services	64,683 MTCO _{2e}	Number of new electric vehicle recharging stations or alternative fuel vehicle support infrastructure	Short term
Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	Public Works, Financial & Management Services, City Manager's Office	5,093 MTCO _{2e}	Number of new efficient or alternatively fueled vehicles in City fleet	Short to long-term
Consider requiring new multi-family residential and mixed use development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.	Planning, Building & Safety, Community Development	Supportive	sq. footage of new development dedicated to useful services/facilities, % reduction in VMT	Short to mid-term
Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	Planning, Public Works, Media	Supportive	Program established	Short-term

TABLE 5-1: CAP IMPLEMENTATION MATRIX				
Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
INDUSTRIAL				
Encourage industrial facility commissioning, or systemically ensuring that new buildings are operating at peak efficiency and improving existing building operations, with the goal equivalent to a 40 percent energy reduction in 30 percent of industrial square footage citywide by 2040.	Planning, Community Development, Economic Development, Building & Safety	38,416 MTCO _{2e}	Number and/or sq. footage of commissioned buildings, % energy use reduction	Short to long-term
Promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Moreno Valley Utility (MVU), Southern California Edison (SCE)) and other private sector funding sources, with the goal of providing 25 percent of energy needs with solar in 30 percent of industrial and warehouse square footage by 2040. Examples of incentives include reduced permit fees or streamlined permit approval processes.	Planning, Community Development, Economic Development, Building & Safety; MVU	22,409 MTCO _{2e}	Number of solar installations, % energy use reduction	Short to long-term
Work with electricity providers (e.g. MVU, SCE) to encourage large commercial and industrial facilities to participate in energy efficient upgrade programs including installation of solar PV systems and EV chargers and meet established annual targets.	Planning, Community Development, Economic Development, Building & Safety; MVU	1,601 MTCO _{2e}	% participation by large commercial and industrial facilities, number of solar PV systems installed, number of EV chargers installed	Short to long-term
Develop and implement Technology Advancement Program, working with industrial, warehousing, and distribution facilities to encourage innovation, development of new emissions reduction technologies, and energy efficient/alternative fueled equipment upgrades. Provide incentives through partnerships with regional, statewide, and federal programs.	Planning, Community Development, Economic Development, Media	3,201 MTCO _{2e}	Technology Advancement Program adopted, % participation by businesses, number of technologies developed, number of equipment upgrades	Short to long-term

5: IMPLEMENTATION, MONITORING AND REPORTING

TABLE 5-1: CAP IMPLEMENTATION MATRIX				
Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
RESIDENTIAL				
Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.	Planning, Building & Safety	13,549 MTCO ₂ e	Number of cool roofs installed	Short to long-term
Require new construction and major remodels to install interior real-time energy smart meters in line with current utility provider (e.g. MVU, SCE) efforts.	Planning, Building & Safety; Moreno Valley Utility	5,280 MTCO ₂ e	Number of smart meters installed, adoption of ordinance requiring installation of smart meters in new construction and major remodels	Short-term
Develop and implement program to incentivize single-family residential efficiency retrofits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide by 2040.	Finance, Planning, Building & Safety; Moreno Valley Utility	3,185 MTCO ₂ e	% participation in direct install program, % energy reduction	Short to long-term
Prioritize cap and trade funds to assist low-income homeowners achieve energy-efficient improvements and fund weatherization programs.	Finance, Planning, Building & Safety	9,793 MTCO ₂ e	% participation of low-income homeowners	Short to mid-term
Apply for and prioritize Community Block Development Grant funds to assist low-income homeowners achieve energy-efficient improvements.	Finance, Planning, Building & Safety	9,793 MTCO ₂ e	% participation of low-income homeowners	Short to mid-term
Develop program and funding strategy to incentivize conversion of natural gas heated homes and nonresidential buildings to electricity.	Planning, Building & Safety; Moreno Valley Utility	4,185 MTCO ₂ e	Number of buildings converted	Short to long-term

TABLE 5-1: CAP IMPLEMENTATION MATRIX

Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
Develop and implement program to incentivize multi-family residential efficiency audits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction in 30 percent of the projected amount of multi-family homes citywide by 2035	Planning, Building & Safety; Moreno Valley Utility	12,955 MTCO ₂ e	% participation in direct install program, % energy reduction	Short to long-term
Provide a toolkit of resources, including web-based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	Planning, Building & Safety	Supportive	Toolkit of resources available, % participation	Short-term
Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.	Planning, Media	Supportive	% participation in program, % emissions reduction	Short-term
COMMERCIAL				
Expand efforts to install energy-efficient lighting technologies in new and existing private parking lots.	Planning, Public Works; Moreno Valley Utility	21,999 MTCO ₂ e	Number of new installations of energy-efficient lighting technologies	Short to long-term
Facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships such as expansion of utility provider (e.g. MVU, SCE, SoCal Gas) programs to reduce energy use.	Planning, Community Development, Economic Development; Moreno Valley Utility	8,307 MTCO ₂ e	Adoption of incentives and regulations	Short to mid-term
Promote energy efficiency financing programs to medium to large sized commercial facilities.	Planning, Community Development, Economic Development; Moreno Valley Utility	479 MTCO ₂ e	% participation by medium to large sized commercial facilities	Short-term

5: IMPLEMENTATION, MONITORING AND REPORTING

TABLE 5-1: CAP IMPLEMENTATION MATRIX				
Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
Promote Moreno Valley Utility and Southern California Edison direct install energy efficiency programs to help small businesses identify opportunities to save electricity.	Planning, Community Development, Economic Development; Moreno Valley Utility	158 MTCO _{2e}	% participation by small businesses	Short-term
Actively engage with Moreno Valley businesses to identify areas for GHG reduction and financial savings.	Planning, Community Development, Economic Development; Moreno Valley Utility	Supportive	% participation by businesses	Short-term
OFF-ROAD EQUIPMENT				
<p>Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.</p> <ul style="list-style-type: none"> ○ Partner with the SCAQMD to establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers. ○ Require new buildings to provide electrical outlets in an accessible location to facilitate use of electric-powered lawn and garden equipment. ○ In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment. 	Planning, Building & Safety; SCAQMD	4,928 MTCO _{2e}	% participation in exchange program	Short to mid-term

TABLE 5-1: CAP IMPLEMENTATION MATRIX

Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
<p>Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles.</p> <ul style="list-style-type: none"> o Require provision of clear signage reminding construction workers to limit idling o Require project applicants to limit GHG emissions through one or more of the following measures: substitute electrified or hybrid equipment for diesel/gas powered, use alternative-fueled equipment on site, avoid use of on-site generators. 	<p>Planning, Building & Safety</p>	<p>1,232 MTCO_{2e}</p>	<p>Establishment of consistent signage and required measures for project applicants</p>	<p>Short to mid-term</p>
<p>PUBLIC SERVICES AND PUBLIC LIGHTING</p>				
<p>Participate in Savings by Design program to identify ways to improve the energy efficiency for all new municipal buildings and facilities. As part of the Savings By Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10%.</p>	<p>City Manager's Office, Planning, Public Works</p>	<p>66 MTCO_{2e}</p>	<p>Implementation of Savings by Design Program; new buildings exceed Title 24 by 10%</p>	<p>Short to long-term</p>
<p>Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy efficient equipment.</p>	<p>City Manager's Office, Planning, Financial & Management Services</p>	<p>121 MTCO_{2e}</p>	<p>Updated Environmental Procurement Administrative Procedure</p>	<p>Short-term</p>
<p>Support Moreno Valley Utility and Southern California's efforts to conduct an annual municipal energy audit to determine if energy efficient retrofits are effective in reducing emissions from City operations.</p>	<p>Moreno Valley Utility, City Manager's Office, Planning</p>	<p>Supportive</p>	<p>Annual municipal audit</p>	<p>Short to long-term</p>
<p>Utilize Energy Management tools to monitor long-term impacts of municipal efficiency projects.</p>	<p>City Manager's Office, Public Works, Planning</p>	<p>Supportive</p>	<p>Consistent use of Energy Management tools</p>	<p>Short to long-term</p>

5: IMPLEMENTATION, MONITORING AND REPORTING

TABLE 5-1: CAP IMPLEMENTATION MATRIX				
Measure	Responsible Department	GHG Reduction Goal	Progress Indicator	Implementation Timeframe
NATURAL RESOURCES				
Require new landscaping to be climate appropriate.	Planning, Public Works, Parks and Community Services	Supportive	Adoption of ordinance requiring climate appropriate landscaping	Short-term
Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	Planning, Public Works	Supportive	% residents and businesses switched to efficient equipment	Short-term
Increase and maintain urban greening in the community by maintaining Tree City USA status and promoting tree planting and urban gardening programs.	Planning, Public Works, Parks and Community Services	Supportive	Tree City USA status; programs established	Short-term

Source: Dyett & Bhatia, 2021.

5.2 Monitoring and Reporting

This CAP serves as a toolkit for the City of Moreno Valley to reduce community-wide GHG emissions and meet emissions targets. Climate action planning, however, is an iterative and adaptive management process: it requires administration, public outreach, monitoring progress and measuring results, periodically revisiting assumptions and adjusting provisions when necessary. Through regular monitoring and measuring the performance of CAP activities, the City will learn what is working and what is not. This will enable the City to make timely adjustments to existing measures, replace ineffective actions, and/or add new measures as changes in technology, federal and state programs, or other circumstances warrant.

Figure 5-1 shows the steps in the process of climate action planning.

Figure 5-1: Process of Climate Action Planning



5: IMPLEMENTATION, MONITORING AND REPORTING

Administration

Following adoption of this CAP, the City will designate a CAP administrator from the Planning Division of the Community Development Department and form an interdisciplinary CAP implementation team from within the City organization. The administrator, in conjunction with the implementation team, will be responsible for initial program start-up activities and for overseeing implementation, monitoring and reporting of all actions described in the CAP. The composition of the implementation team may vary from time to time as needed, but it is expected that core members will include staff from Public Works, Community Development, Economic Development, Finance, and Media departments. As some of the monitoring and reporting activities will require coordination with other agencies, the implementation team will need to foster effective partnerships accordingly.

The CAP will be administered by the City of Moreno Valley Community Development Department, Planning Division and operating resources for administering the CAP will be provided through the Planning Division's annual budget. To maximize efficiency and maintain costs, the City will integrate CAP implementation activities into existing workloads and programs whenever possible. However, since program incentives and funding sources change over time, the CAP administrator and Implementation Team will need to keep current on available resources as GHG reduction measures are implemented.

Education and Outreach

A program of this scope and consequence will require substantial community support in order to succeed. Key to garnering this support is to raise the level of community awareness through education and outreach. Many of the individual GHG reduction measures in Chapter 4 include a promotion and education component. In addition to these features built into the CAP, the City may provide information about climate change science, anticipated impacts, and resources for residents and businesses to take action via its website, social media, and other communications channels. The City's website already has a good deal of information related to energy and water efficiency programs, and other environmental sustainability efforts. This Climate Action Plan is also available on the City's website. The City will build upon this base of resources by providing current information and links to various local, state and federal incentive programs to reduce one's carbon footprint, and provide assistance to homeowners, businesses, and contractors seeking to make energy efficiency improvements.

Monitoring and Reporting

The City of Moreno Valley will periodically monitor and report on CAP implementation activities, for example, every five years thereafter. The monitoring report will include implementation status of each action and progress towards achieving the performance targets of the corresponding emissions reduction measure. The monitoring report will also include information on the status of the federal, state, regional, and local level emissions reduction strategies identified in Chapter 1 of this CAP, as well as any new efforts that may emerge in the reporting year. The monitoring report will be provided on the City's website.

Updating GHG Inventory and the CAP

The City will include the 2018 emissions inventory in the first monitoring report, and then will update the inventory periodically (for example, every five years thereafter). For continuity, the inventory updates will tally emissions from the same sectors analyzed in Chapter 2 of this CAP. If an updated inventory reveals that the plan is not making adequate progress toward meeting the GHG target, or that new technologies and programs emerge that warrant inclusion in the CAP, the City may adjust the CAP by modifying, adding, and/or replacing measures as necessary. New opportunities for GHG reductions, including new funding sources and the ability to link city reduction actions to the City's Capital Improvement Plan, Infrastructure Replacement and Fleet Vehicle Replacement schedules, and other programs can also be incorporated into future updates of the CAP. Recommendations to adjust the CAP may be presented to the City Council as part of the monitoring report or at any other time throughout the year as necessary to ensure effective CAP implementation.

5: IMPLEMENTATION, MONITORING AND REPORTING

This page intentionally left blank.

Appendix A

Climate Change Informational Resources

Combating climate change requires education and personal action. This section contains resources on climate change and its impacts, calculating individual carbon footprints, and ways to reduce individual carbon footprints.

Education

The evidence is clear that climate change is happening. Humans are largely responsible for recent climate change. International scientific bodies, federal agencies, and state agencies have numerous resources that summarize the current scientific understanding of climate change and the latest projections of climate change impacts.

The Intergovernmental Panel on Climate Change is the leading international body for the assessment of climate change:

- ❖ <http://www.ipcc.ch/>

The National Aeronautics and Space Administration (NASA) has documented recent impacts and future trends of climate change. NASA also provides resources dedicated to teaching children about climate change basics:

- ❖ <http://climate.nasa.gov/effects>
- ❖ <https://climatekids.nasa.gov/>

The U.S. Environmental Protection Agency (U.S. EPA) has information of climate change, and its effects:

- ❖ <https://www.climate.gov/teaching/resources/climate-change-basics-0>

APPENDIX A: INFORMATIONAL RESOURCES

Cal-Adapt, a product of the Public Interest Energy Research (PIER) program, funded by the California Energy Commission, provides California-specific climate change research, including interactive climate tools:

- ❖ <http://cal-adapt.org/>

The California Office of Environmental Health Hazard Assessment (OEHHA) has developed indicators of climate change in California, including indicators describing the disproportionate impacts of climate change on environmental justice communities and California tribes:

- ❖ <https://oehha.ca.gov/climate-change>

Carbon Footprint

A carbon footprint is a measure of the total amount of GHG emissions produced by an individual. It can be thought of as a personal inventory of one's impacts on climate change. There are a number of online calculators that estimate personal carbon footprints. Individuals can use the following carbon footprint calculators as a guide to help reduce personal carbon emissions.

U.S. Environmental Protection Agency (EPA)

- ❖ <https://www3.epa.gov/carbon-footprint-calculator/>

Cool California

- ❖ <https://coolcalifornia.arb.ca.gov/calculator-households-individuals>

Cool Climate Network

- ❖ <https://coolclimate.org/calculator>

Nature Conservancy

- ❖ <https://www.nature.org/en-us/get-involved/how-to-help/consider-your-impact/carbon-calculator/>

Carbon Footprint

- ❖ <http://www.carbonfootprint.com/calculator1.html>

Global Footprint Network

- ❖ <https://www.footprintnetwork.org/resources/footprint-calculator/>

Reducing your Carbon Footprint

Reducing one's personal carbon footprint saves money, decreases impact on the environment, and helps fight climate change. The following links provide resources on changes one can make in his or her day-to-day life to diminish GHG emissions.

U.S Department of Energy: Save energy, save money

- ❖ <http://energy.gov/energysaver/energy-saver>

California Air Resources Board: Low emissions vehicles

- ❖ <https://ww2.arb.ca.gov/our-work/topics/clean-cars>

Carbon Fund: Reduce what you can, offset what you can't

- ❖ <https://carbonfund.org/reduce/>

New York Times: How to Reduce Your Carbon Footprint

- ❖ <https://www.nytimes.com/guides/year-of-living-better/how-to-reduce-your-carbon-footprint>

APPENDIX A: INFORMATIONAL RESOURCES

This page intentionally left blank.

Appendix B

Effectiveness of GHG Reduction Strategies

Appendix B provides the GHG reduction strategies established in Tables 4-1 through 4-7 and Table 5-1 of the Climate Action Plan, adding a description of each strategy and evidence of the effectiveness utilized to calculate total emissions reductions. See following page.

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
TRANSPORTATION STRATEGIES				250,075 MTCO₂e
TR-1	Partner with Moreno Valley Unified School District (MVUSD), Val Verde Unified School District (VVUSD) and Moreno Valley College to establish an online system like 511.org that links employees and guardians of students to provide carpool matching.	This measure is designed to reduce school trip-related transportation emissions by creating an online system that functions as a ridesharing program for Moreno Valley students and parents. A carpool matching program provides additional opportunities for transportation to schools within Moreno Valley for residents who are unable to utilize school bus and local transit services.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 7.2 – 15.8 percent reduction in VMT and therefore 7.2 – 15.8 percent reduction in GHG emissions. Given that this measure is voluntary, 7.2 percent effectiveness is used.	36,671 MTCO ₂ e
TR-2	Continue to implement a Safer Routes to School program for increased bicycle and pedestrian safety to and from schools.	This measure is designed to reduce school trip-related transportation emissions by continuing to implement the Safe Routes to School program to increase bicycle and pedestrian safety to and from schools. By increasing safety, residents will feel more comfortable choosing alternative transportation options and will reduce school trip-related VMT. There are numerous benefits to Safe Routes To School programs including reduced traffic congestion surrounding schools, increased physical activity for students, improved air quality and reduced fuel consumption from idling vehicles, and increased community involvement.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 7.2 – 15.8 percent reduction in VMT and therefore 7.2 – 15.8 percent reduction in GHG emissions. Given that this measure is voluntary, 7.2 percent effectiveness is used.	36,671 MTCO ₂ e
TR-3	Establish a goal of achieving a 10 percent increase in alternative mode use by people employed in Moreno Valley, working with businesses with over 50	This measure is designed to reduce employee commute-related transportation emissions by encouraging medium- and large-sized businesses to implement Transportation Demand Management Strategies identified in Connect SoCal. Transportation Demand	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commuter Trip Reduction programs typically reduce affected commuters' vehicle travel by 5 – 15% if they rely only on information, and 10 – 30% if they also	50,932 MTCO ₂ e

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
	employees to implement on a voluntary basis Transportation Demand Management strategies and programs identified in Connect SoCal, the SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), including but not limited to: implementing commuter benefit programs, promoting telecommuting and alternative work schedule options, and other financial incentives.	Management (TDM) is a set of strategies that aims to reduce the demand for roadway travel, particularly from single-occupancy vehicles (SOV). TDM investments can reduce congestion and shift trips from SOVs to other modes in ways that often cost significantly less than roadway or transit capital expansion projects. TDM strategies add transportation choices that improve sustainability, public health and the quality of life by reducing congestion, air pollution and GHG emissions. When transit ridership, carpooling, bicycling and walking increase, the efficiency of the entire transportation system improves, bringing many benefits to the SCAG region. These benefits can justify relatively modest public expenditures on effectively implemented TDM programs.	include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of 5 – 30 percent effectiveness. Given that this strategy includes financial incentives but applies only to businesses with over 50 employees and is voluntary, 10.0 percent effectiveness is used.	
TR-4	Create a Transportation Demand Management program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	This measure is designed to reduce employee commute-related transportation emissions by creating a Transportation Demand Management program for City staff. This measure is similar to TR-3, but implementation is at the City's discretion.	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commuter Trip Reduction programs typically reduce affected commuters' vehicle travel by 5 – 15% if they rely only on information, and 10 – 30% if they also include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of 5 – 30 percent effectiveness. Given that this strategy may not include financial incentives and applies only to City staff, 5.0 percent effectiveness is used.	25,466 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
TR-5	Implement trip reduction programs in new residential, commercial, and mixed-use developments.	This measure is designed to ensure that new residential, commercial, and mixed-use developments incorporate commute trip reduction programs. A commute trip reduction program is a multi-strategy program that encompasses a combination of individual measures such as transit fare subsidies, ride-share programs, parking cash-out or priced parking, shuttles, and improved on-side amenities.	The Victoria Transport Policy Institute's TDM Encyclopedia: Energy Conservation and Emissions Reduction Strategies finds that "Commute Trip Reduction programs typically reduce affected commuters' vehicle travel by 5 – 15% if they rely only on information, and 10 – 30% if they also include Financial Incentives such as cost-recovery parking pricing or parking cash out." Therefore, implementation of TDM strategies has a range of 5 – 30 percent effectiveness. Given that this strategy may not include financial incentives and applies only to new development, 5.0 percent effectiveness is used.	25,466 MTCO _{2e}
TR-6	Advocate for transit service improvements by area transit providers with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	This measure is designed to improve transit service and access to transit by coordinating public transit schedules and connections and provide financial subsidies or transit passes to encourage more residents and employees to choose transit over single-occupancy vehicles, thus reducing transportation-related emissions.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.3 – 20.0 percent reduction in VMT and therefore 0.3 – 20.0 percent reduction in GHG emissions. Given that this measure would provide financial incentives but would require coordination with transit providers, 1.0 percent effectiveness is used.	5,093 MTCO _{2e}
TR-7	Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	This measure is designed to expand electric and alternative fuel vehicle infrastructure throughout Moreno Valley to encourage the switch to low or zero-emissions vehicles, thus reducing transportation-related emissions.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.5 – 12.7 percent reduction in VMT and therefore 0.5 – 12.7 percent reduction in GHG emissions. Moreno Valley has an existing network of electric vehicle recharging stations and similar policies are included in the City's	64,683 MTCO _{2e}

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
			Energy Efficiency and Climate Action Strategy. Additionally, Moreno Valley Utility is developing a strategic plan that will provide a roadmap for electric vehicle infrastructure and is in the process of creating incentives and rates to encourage EV adoption. Therefore, 12.7 percent effectiveness is used.	
TR-8	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	This measure is designed to reduce transportation-related emissions associated with the City vehicle fleet by increasing the number of efficient or alternatively fueled vehicles.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.4 – 20.3 percent reduction in VMT and therefore 0.4 – 20.3 percent reduction in GHG emissions. Given that this measure depends on the timing of City vehicle turnover, 1.0 percent effectiveness is used.	5,093 MTCO _{2e}
TR-9	Consider requiring new multi-family residential and mixed use development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping.	This measure is designed to reduce transportation-related emissions by requiring new multi-family residential and mixed-use development to provide useful services and facilities on-site. Access to necessary services such as an ATM, vehicle refueling, electric vehicle infrastructure, and shopping will encourage residents of these developments to stay local and reduce vehicle trips.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions, VMT, and energy consumption.	0 MTCO _{2e}
TR-10	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	This measure is designed to reduce transportation-related emissions by establishing “open streets” days where a portion of streets and plazas are designated for pedestrian and/or bicycle access only. This measure creates temporary open space, relieves congestion, and fosters community health and community building.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions, VMT, and energy consumption.	0 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
INDUSTRIAL STRATEGIES				65,628 MTCO₂e
I-1	Actively promote the use of energy-efficient building operations systems in existing and new industrial facilities with the goal of achieving a 40 percent energy reduction in 30 percent of industrial square footage citywide by 2040. Effectiveness should be confirmed through commissioning of new systems.	This measure is designed to reduce emissions from industrial building energy use. Commissioning is a systematic process of ensuring that a building performs according to its design and the occupant's operational needs. Commissioning allows the design developed to be successfully constructed and operated. Examples includes measuring temperatures and flow rates from heating, ventilation, and air conditioning (HVAC) systems to calibrate to a known standard, as well as reviewing operations to verify that controls are properly functioning.	The paper "Building commissioning: a golden opportunity for reducing energy costs and greenhouse gas emissions in the United States" by Evan Mills found that the application of commissioning "resulted in 16% median whole-building energy savings in existing buildings and 13% in new construction." GHG emissions reduction is calculated by applying the goal of 40 percent energy reduction to With Project 2040 emissions generated by 30 percent of industrial square footage (calculated based on full buildout of the General Plan 2040), resulting in 12 percent effectiveness and a range of 12 to 16 percent reduction in energy consumption and therefore emissions.	38,416 MTCO ₂ e
I-2	Promote and incentivize solar installations on new and existing industrial and warehousing facilities through partnerships with energy providers (e.g. Moreno Valley Utility (MVU), Southern California Edison (SCE)) and other private sector funding sources, with the goal of providing 25 percent of energy needs with solar in 30 percent of industrial and warehouse square footage by 2040. Examples of incentives	This measure is designed to reduce emissions from industrial building energy use through the installation of solar photovoltaic systems, which generate nearly zero emissions compared to traditional energy sources. This measure may be accomplished through financial and administrative incentives coupled with partnerships with energy providers and outreach to local businesses.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0 to 100 percent reduction in GHG emissions through installation of onsite solar power renewable energy systems. Emissions reduction is calculated by applying the goal of 25 percent energy provision through solar to With Project 2040 emissions generated by 30 percent of industrial square footage (calculated based on full buildout of the General Plan 2040), resulting in 7.5 percent, rounded down to 7.0 percent effectiveness .	22,409 MTCO ₂ e

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
	include reduced permit fees or streamlined permit approval processes.			
I-3	Work with electricity providers (e.g. MVU, SCE) to encourage large commercial and industrial facilities to participate in energy efficient upgrade programs including installation of solar PV systems and EV chargers and to establish annual targets.	This measure is designed to reduce emissions from industrial building energy use through energy efficient upgrades. This may include onsite installation of solar PV systems and EV chargers, installation of energy efficient lighting and HVAC systems, and other methods of improving energy efficiency. This measure also requires the City and/or MVU to establish annual targets for industrial energy efficiency upgrades.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.2 – 5.5 percent reduction in GHG emissions associated with non-residential electricity use and 0.7 – 10.0 percent reduction associated with natural gas use. Given that this measure is voluntary and applies only to large commercial and industrial facilities, 0.5 percent effectiveness is used.	1,601 MTCO _{2e}
I-4	Develop and implement Technology Advancement Program, working with industrial, warehousing, and distribution facilities to encourage innovation, development of new emissions reduction technologies, and energy efficient/alternative fueled equipment upgrades. Provide incentives through partnerships with regional, statewide, and federal programs.	This measure is designed to promote collaboration with industrial, warehousing, and distribution businesses in Moreno Valley to encourage innovation while reducing emissions from industrial building energy use. Multiple neighboring cities have found success in implementing such programs, and the City's Energy Efficiency and Climate Action Strategy includes similar strategies. This measure would provide financial incentives funded by partnerships with regional, statewide, and federal programs.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0.4 – 20.3 percent reduction in GHG emissions. Given that this measure is voluntary and applies only to large industrial facilities, but provides incentives and could result in economic benefits to companies involved, 1.0 percent effectiveness is used.	3,201 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
RESIDENTIAL STRATEGIES				58,742 MTCO₂e
R-1	Provide incentives such as streamlined permitting or bonus density for new multi-family buildings and re-roofing projects to install "cool" roofs consistent with the current California Green Building Code (CALGreen) standards for commercial and industrial buildings.	This measure is designed to reduce residential emissions through the installation of "cool" roofs. Cool roofs use reflective materials, often but not always light colored, to reflect more of the sun's energy than traditional dark roofs, and to more efficiently transmit heat from the building's interior. Compared to conventional dark roofs, the surface of a cool roof can be 50° to 60°F (28° to 33°C) cooler on a hot, sunny day. CALGreen has implemented standards for installation of cool roofs that apply only to new commercial and industrial buildings; this measure expands application of these standards to new multi-family buildings and re-roofing projects.	The Natural Resources Defense Council (NRDC) report "Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California" found that "studies vary widely but have shown that cool roofs generate savings of 10 to 43 percent of a building's cooling energy demand, with one case study documenting that a residence in Sacramento achieved a savings of 69 percent." The report identifies an average cooling load reduction of 25 percent. Therefore, 25 percent effectiveness is used and is applied to multi-family homes calculated based on full buildout of the General Plan 2040.	13,549 MTCO ₂ e
R-2	Require new construction and major remodels to install interior real-time energy smart meters in line with current utility provider (e.g. MVU, SCE) efforts.	This measure is designed to reduce residential emissions through installation of smart meters in new construction and major remodels, which encourages residents to understand their personal generation of GHG emissions. This measure will encourage residents to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward.	The American Council for an Energy-Efficient Economy report "Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities" references studies indicating average energy savings of 7 percent from installation of in-home energy monitors. Therefore, 7 percent effectiveness is used and is applied to new multi-family homes calculated based on full buildout of the General Plan 2040.	5,280 MTCO ₂ e

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
R-3	Develop and implement program to incentivize single-family residential efficiency retrofits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction compared to baseline in 30 percent of the total single-family homes citywide by 2040.	This measure is designed to reduce emissions from single-family residential building energy use through efficiency retrofits and participation in the Moreno Valley Utility Residential Energy Audit and Direct Install Program. The program provides eligible residential customers with a full in-home energy audit which includes specific energy efficiency recommendations for their home plus a fixed set of maintenance and upgrades provided at no cost up to the value cap set by energy use range or program participation. Measures included in this program are AC tune-ups, duct testing and sealing, HVAC filter change and energy efficient lighting.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies this measure as a Best Management Practice. Emissions reduction is calculated by applying the goal of 50 percent energy reduction to With Project 2040 emissions generated by 30 percent of single-family homes (calculated based on full buildout of the General Plan 2040), resulting in 15 percent effectiveness .	3,185 MTCO _{2e}
R-4	Prioritize cap and trade funds to assist low-income homeowners achieve energy-efficient improvements and fund weatherization programs.	This measure is designed to reduce emissions from residential building energy use while supporting low-income homeowners. Disadvantaged communities identified by CalEnviroScreen are specifically targeted for investment of proceeds from the State's cap-and-trade program. Energy-efficient improvement and weatherization programs are common recipients of cap-and-trade funds. Weatherization reduces energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety.	The Low-Income Weatherization Program (LIWP) is the state's first energy efficiency program that targets low-income Californians and has reduced energy bills in participating multifamily buildings by 30 percent and overall energy usage by an average of 40 percent. CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 3.7 – 7.5 percent reduction in GHG emissions. Given that this measure is dependent on funding and applies only to low-income homeowners, 3.7 percent effectiveness is used .	9,793 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO_{2e} per year)
R-5	Apply for and prioritize Community Block Development Grant funds to assist low-income homeowners achieve energy-efficient improvements.	This measure is designed to ensure that new residential, commercial, and mixed-use developments incorporate commute trip reduction programs. A commute trip reduction program is a multi-strategy program that encompasses a combination of individual measures such as transit fare subsidies, ride-share programs, parking cash-out or priced parking, shuttles, and improved on-side amenities.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 3.7 – 7.5 percent reduction in GHG emissions. Given that this measure is dependent on funding and applies only to low-income homeowners, 3.7 percent effectiveness is used.	9,793 MTCO _{2e}
R-6	Develop program and funding strategy to incentivize conversion of natural gas heated homes and nonresidential buildings to electricity.	This measure is designed to reduce emissions from residential and nonresidential building natural gas use by incentivizing conversion to electricity, which would generate a lower level of GHG emissions. This measure is dependent on funding and execution of the program to provide financial incentives for building owners to make the conversion.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 2.0 – 4.0 percent reduction in GHG emissions. Given that this measure would provide financial incentives but would be voluntary, 2.0 percent effectiveness is used and applied to total housing units and non-residential square footage calculated based on full buildout of the General Plan 2040.	4,185 MTCO _{2e}
R-7	Develop and implement program to incentivize multi-family residential efficiency audits and participation in Moreno Valley Utility direct install program with the goal of a 50 percent energy reduction in 30 percent of the projected amount of multi-family homes citywide by 2035	This measure is designed to reduce emissions from multi-family residential building energy use through participation in the Moreno Valley Utility Residential Energy Audit and Direct Install Program. The program provides eligible residential customers with a full in-home energy audit which includes specific energy efficiency recommendations for their home plus a fixed set of maintenance and upgrades provided at no cost up to the value cap set by energy use range or program participation. Measures included in this program are AC tune-ups, duct testing	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies this measure as a Best Management Practice. Emissions reduction is calculated by applying the goal of 50 percent energy reduction to With Project 2040 emissions generated by 30 percent of multi-family homes (calculated based on full buildout of the General Plan 2040), resulting in 15 percent effectiveness.	12,955 MTCO _{2e}

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
		and sealing, HVAC filter change and energy efficient lighting.		
R-8	Provide a toolkit of resources, including web-based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	This measure is designed to reduce residential emissions by encouraging residents to understand their personal generation of GHG emissions. While not all residents or businesses will utilize this toolkit, this measure will encourage citizens and businesses to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward. The carbon footprint calculators provided in Appendix A may be used in the toolkit.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and residential and commercial energy consumption.	0 MTCO _{2e}
R-9	Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.	This measure is designed to reduce residential emissions by encouraging residents to maximize opportunities to reduce personal GHG emissions through a competition. While not all residents will participate, this measure will encourage citizens to be more conscious of how they can reduce their own carbon footprint and integrate sustainable behaviors moving forward. The carbon footprint calculators provided in Appendix A may be used to track progress in the competition.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and residential energy consumption.	0 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
COMMERCIAL STRATEGIES				
C-1	Expand efforts to install energy-efficient lighting technologies in new and existing private parking lots.	This measure is designed to reduce emissions generated by lighting in private parking lots by partnering with businesses to install energy-efficient lighting technologies.	Moreno Valley Utility is currently working on a LED Streetlight Retrofit Project, and has found that conversion to energy-efficient lighting technology may reduce energy consumption by up to 68 percent. CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 16 to 40 percent. Given that similar efforts are currently underway but this measure will require collaboration with private parking lot owners, 20 percent effectiveness is used.	21,999 MTCO ₂ e
C-2	Facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships such as expansion of utility provider (e.g. MVU, SCE, SoCal Gas) programs to reduce energy use.	This measure is designed to reduce commercial emissions by facilitating energy efficiency improvements through incentives and regulations. This measure provides a range of options to engage nonresidential building owners in energy efficiency improvements, including financial incentives.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 5.2 – 15.0 percent reduction in GHG emissions. Given that this measure provides financial incentives but is optional, 5.2 percent effectiveness is used.	8,307 MTCO ₂ e
C-3	Promote energy efficiency financing programs to medium to large sized commercial facilities.	This measure is designed to reduce emissions from commercial building energy usage and is specifically targeted at medium to large businesses. This measure promotes and connects businesses with energy efficiency financing programs through Moreno Valley Utility,	The Environmental Protection Agency (EPA) paper "Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions" indicates that energy efficiency improvements in nonresidential buildings result in an average energy savings and therefore effectiveness of 0.4 percent . This is	479 MTCO ₂ e

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
		Southern California Edison, SoCal Gas, and local agencies.	applied to 75 percent of nonresidential square feet calculated based on full buildout of the General Plan 2040 to represent medium to large sized business square footage.	
C-4	Promote Moreno Valley Utility and Southern California Edison direct install energy efficiency programs to help small businesses identify opportunities to save electricity.	This measure is designed to reduce emissions from commercial building energy usage and is specifically targeted at small businesses. The measure promotes the Moreno Valley Utility Residential Energy Audit and Direct Install Program and Southern California Direct Install Program. Both programs offers long-term energy savings to qualifying businesses by providing no- or low-cost energy-efficient products, including installation.	The Environmental Protection Agency (EPA) paper "Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions" indicates that energy efficiency improvements in nonresidential buildings result in an average energy savings and therefore effectiveness of 0.4 percent . This is applied to 25 percent of nonresidential square feet calculated based on full buildout of the General Plan 2040 to represent small business square footage.	158 MTCO _{2e}
C-5	Actively engage with Moreno Valley businesses to identify areas for GHG reduction and financial savings.	This measure is designed to reduce commercial emissions by encouraging businesses to maximize opportunities to reduce GHG emissions through and save money. While not all businesses will participate, this measure will encourage businesses to be more conscious of how they can reduce their own carbon footprint and integrate sustainable practices moving forward. By marketing these efforts and highlighting opportunities for financial savings, businesses may be encouraged to participate. The carbon footprint calculators provided in Appendix A may be used to track progress in the competition.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and commercial energy consumption.	0 MTCO _{2e}

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO ₂ e per year)
OFF-ROAD EQUIPMENT STRATEGIES				6,160 MTCO₂e
OR-1	<p>Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.</p> <ul style="list-style-type: none"> o Partner with the SCAQMD to establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers. o Require new buildings to provide electrical outlets in an accessible location to facilitate use of electric-powered lawn and garden equipment. o In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment. 	<p>This measure is designed to reduce emissions generated by gas-powered and inefficient lawn and garden maintenance equipment. This measure is voluntary for most residents but provides multiple opportunities to replace off-road equipment with alternatives that generate reduced emissions. By requiring new development to provide electrical outlets, this measure further encourages use of efficient equipment. Finally, this measure encourages planting of native vegetation to remove the need for lawn and garden maintenance equipment, as well as reducing emissions generated through consumption of water.</p>	<p>CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 0 to 49.5 percent. Given that this measure is largely voluntary and relies on project review, 1.0 percent effectiveness is used.</p>	4,928 MTCO ₂ e

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
OR-2	<p>Reduce emissions from heavy-duty construction equipment by limiting idling based on South Coast Air Quality Management District (SCAQMD) requirements and utilizing cleaner fuels, equipment, and vehicles.</p> <ul style="list-style-type: none"> o Require provision of clear signage reminding construction workers to limit idling o Require project applicants to limit GHG emissions through one or more of the following measures: substitute electrified or hybrid equipment for diesel/gas powered, use alternative-fueled equipment on site, avoid use of on-site generators. 	<p>This measure is designed to reduce emissions generated by heavy-duty construction equipment. Development of the General Plan 2040 will result in increased construction in Moreno Valley, and therefore would necessitate the use of heavy-duty construction equipment. This measure would establish requirements to limit idling, reducing localized emissions, and would require project applicants to utilize more efficient and climate-friendly equipment during construction.</p>	<p>CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 2.5 to 22 percent reduction in GHG emissions. Given that this measure establishes requirements for project applicants but does not establish new standards or require a comprehensive switch to alternative fueled equipment, 2.5 percent effectiveness is used.</p>	<p>1,232 MTCO_{2e}</p>

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
PUBLIC SERVICES AND PUBLIC LIGHTING STRATEGIES				187 MTCO_{2e}
PS-1	Participate in Savings by Design program to identify ways to improve the energy efficiency for all new municipal buildings and facilities. As part of the Savings By Design program, new municipal buildings and facilities shall have a goal to exceed Title 24 Building Standards by 10%.	This measure is designed to reduce emissions generated by municipal buildings and facilities. Savings by Design is a program to encourage high-performance nonresidential building design and construction within the service territories of PG&E, SDG&E, Southern California Edison, or Southern California Gas. The program offers building owners and their design team a wide range of services including design assistance, owner incentives, and design team incentives. Financial incentives are available when the efficiency of the building exceeds Title 24 Building Standards by 10 percent.	CAPCOA Quantifying Greenhouse Gas Mitigation Measures identifies a range of effectiveness of 2.5 – 5.5 percent reduction in GHG emissions for nonresidential buildings that exceed Title 24 by 10 percent. Given that this measure establishes a goal of 10 percent beyond Title 24 Building Standards and similar policies are included in the City's Energy Efficiency and Climate Action Strategy, 5.5 percent effectiveness is used.	66 MTCO _{2e}
PS-2	Expand City of Moreno Valley's Environmental Procurement Administrative Procedure to address energy efficient equipment.	This measure is designed to reduce emissions generated by municipal equipment through the City's procurement policy. Moreno Valley's current Environmental Procurement Administrative Procedure currently focuses on the procurement of services and products that "reduce toxicity; conserve natural resources, materials, and energy; and maximize recyclability and recycled content" but does not specifically promote energy efficiency equipment.	The EPA report "Energy-Efficient Product Procurement: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs" finds that "purchasing energy-efficient products, which operate as effectively as conventional ones, can reduce government facility energy costs by about 5 – 10 percent. " Given that Moreno Valley has already adopted an Environmental Procurement Administrative Procedure and similar policies are included in the City's Energy Efficiency and Climate Action Strategy, 10.0 percent effectiveness is used.	121 MTCO _{2e}

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO₂e per year)
PS-3	Support Moreno Valley Utility and Southern California's efforts to conduct an annual municipal energy audit to determine if energy efficient retrofits are effective in reducing emissions from City operations.	This measure is designed to reduce and monitor emissions from municipal building energy usage through an annual energy audit. This measure supports measures PS-1 and PS-2.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and municipal energy consumption.	0 MTCO ₂ e
PS-4	Utilize Energy Management tools to monitor long-term impacts of municipal efficiency projects.	This measure is designed to reduce and monitor emissions from municipal building energy usage through the use of Energy Management tools. This measure supports measures PS-1 and PS-2.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and municipal energy consumption.	0 MTCO ₂ e
NATURAL RESOURCES STRATEGIES				0 MTCO₂e
NC-1	Require new landscaping to be climate appropriate.	This measure is designed to reduce emissions generated by the management and distribution of water consumed in landscaping maintenance. Climate appropriate landscaping would require less water and therefore generate reduced emissions.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption.	0 MTCO ₂ e
NC-2	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	This measure is designed to reduce emissions generated by the management and distribution of water consumed in landscaping maintenance and emissions generated by landscaping equipment (see OR-1). Native planting would require less water and energy consumption and therefore generate reduced emissions.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption.	0 MTCO ₂ e

APPENDIX B: EFFECTIVENESS OF GHG REDUCTION STRATEGIES

TABLE B-1: EFFECTIVENESS OF GHG REDUCTION STRATEGIES				
ID	Measure	Description	Evidence of Effectiveness	Estimated GHG Emissions Reduction (MTCO _{2e} per year)
NC-3	Increase and maintain urban greening in the community by maintaining Tree City USA status and promoting tree planting and urban gardening programs.	This measure is designed to reduce emissions through carbon sequestration. Additionally, tree planting programs would provide shade, thereby limiting the effects of urban heat islands.	This measure is supportive, and the emissions reduction potential cannot be precisely quantified. Implementation of this measure is likely to result in an unknown reduction in GHG emissions and water consumption, and would limit the effects of heat islands	0 MTCO _{2e}
TOTAL EMISSIONS REDUCTION FROM CLIMATE ACTION PLAN STRATEGIES				411,743 MTCO_{2e}

Sources:

- Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. 2010. American Council for an Energy-Efficient Economy (ACEEE). <https://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>
- Building commissioning: a golden opportunity for reducing energy costs and greenhouse gas emissions in the United States. 2011. Mills, Evan. Energy Efficiency 4, 145–173). <https://doi.org/10.1007/s12053-011-9116-8>.
- Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions. 2009. U.S. Environmental Protection Agency (EPA). National Action Plan For Energy Efficiency. https://www.epa.gov/sites/production/files/2015-08/documents/ee_and_carbon.pdf.
- Energy-Efficient Product Procurement: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs. 2011. U.S. Environmental Protection Agency (EPA). <https://www.epa.gov/sites/production/files/2015-08/documents/energyefficientpurchasing.pdf>.
- Looking Up: How Green Roofs and Cool Roofs Can Reduce Energy Use, Address Climate Change, and Protect Water Resources in Southern California. 2021. Natural Resources Defense Council (NRDC). <https://www.nrdc.org/sites/default/files/GreenRoofsReport.pdf>
- Quantifying Greenhouse Gas Mitigation Measures. 2010. California Air Pollution Control Officers Association (CAPCOA). Energy Conservation and Emissions Reduction Strategies. February 5, 2021.
- Victoria Transport Policy Institute. <https://www.vtpi.org/tdm/tdm59.htm>. Accessed on: March 19, 2021.

Appendix C

Potential Project Level GHG Reduction Measures

In addition to the potential programmatic measures contained in this Climate Action Plan, the following is a non-exclusive list of potential additional measures that can be applied at the project level to reduce greenhouse gas emissions. It should be noted that these measures are not essential for the City to meet its GHG reduction targets, but are presented here for informational purposes. Sources for additional potential measures include those listed in CAPCOA's "CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act (January 2008)" and OPR's "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA)."

Renewable Energy

- ❖ Provide onsite renewable energy system(s). Nonpolluting and renewable energy potential includes solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies
- ❖ Include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources

Green Building

- ❖ Meet recognized green building and energy efficiency benchmarks such as LEED and ENERGY STAR
- ❖ Incorporate materials which are resource efficient, recycled, with long life cycles and manufactured in an environmentally friendly way

APPENDIX C: POTENTIAL PROJECT LEVEL GHG MITIGATION MEASURES

Energy Efficiency

- ❖ Exceed Diamond Bar Green Building Code (Title 24) mandatory efficiency requirements by 15% or more
- ❖ Install light colored “cool” roofs (e.g. Energy Star roofing) or other highly reflective, highly emissive roofing materials
- ❖ Install a vegetated (“green”) roof that covers at least 50% of roof area
- ❖ Design project to maximize solar orientation (i.e., 75% or more building face north or south; include roof overhangs that block high summer sun, but not lower winter sun, from penetrating south-facing windows)
- ❖ Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling
- ❖ Install energy-reducing ceiling/whole-house fans
- ❖ Install energy efficient lighting (e.g., light emitting diodes (LEDs)), heating and cooling systems, appliances, equipment, and control systems. (e.g., Energy Star)
- ❖ Install energy-reducing programmable thermostats that automatically adjust temperature settings

Transportation

- ❖ Develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes
- ❖ Create an online ridesharing program that matches potential carpoolers immediately through email
- ❖ Provide fair-share funding of transportation improvements
- ❖ Provide shuttle service or public transit incentives such as transit passes to decrease work-related auto trips
- ❖ Provide “end-of-trip” facilities including showers, lockers, and changing space (nonresidential projects)
- ❖ Incorporate public transit into project design
- ❖ Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments
- ❖ Provide amenities for non-motorized transportation, such as secure and convenient bicycle parking
- ❖ Provide plentiful short- and long-term bicycle parking facilities (nonresidential projects)
- ❖ Provide long-term bicycle parking is provided at apartment complexes or condominiums without garages

- ❖ Create pedestrian (and/or bicycle) access network that internally links all uses and connects to all existing/planned external streets and pedestrian (and/or bicycle) facilities contiguous with the project site
- ❖ Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances
- ❖ Provide parking for EVs/CNG vehicles
- ❖ Install EV charging facilities

Water Conservation

- ❖ Install water-efficient fixtures and appliances such as low-flow fixtures, dual flush toilets, and other water efficient appliances
- ❖ Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls and use water-efficient irrigation methods
- ❖ Implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment
- ❖ Incorporate recycled/reclaimed water for landscape irrigation and other non-potable water use needs
- ❖ Incorporate rain barrels and gray water systems for landscape irrigation

Landscaping

- ❖ Incorporate into landscapes drought resistant native trees, trees with low emissions and high carbon sequestration potential
- ❖ Provide parking lot areas with 50% tree cover within 10 years of construction, in particular low emitting, low maintenance, native drought resistant trees. Reduces urban heat island effect
- ❖ Dedicate space for neighborhood gardening
- ❖ Establish an urban tree planting program

Solid Waste Measures

- ❖ Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard)
- ❖ Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas
- ❖ Provide education and publicity about reducing waste and available recycling services

APPENDIX C: POTENTIAL PROJECT LEVEL GHG MITIGATION MEASURES

This page intentionally left blank.



MORENO VALLEY
WHERE DREAMS SOAR

DYETT & BHATIA
Urban and Regional Planners