City of Lemon Grove

CLIMATE ACTION PLAN

January 2020

PREPARED BY:
The City of Lemon Grove

IN CONSULTATION WITH:
Ascent Environmental, Inc.
Energy Policy Initiatives Center

City of Lemon Grove Climate Action Plan

Prepared for:

City of Lemon Grove
3232 Main Street
Lemon Grove, California 91945

Prepared by:

1230 Columbia Street, Suite 440
San Diego, California 92101

5998 Alcalá Park
San Diego, California 92110

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Credits and Acknowledgements

City of Lemon Grove

City Council

Racquel Vasquez, Mayor

Jennifer Mendoza, Mayor Pro-Tem

David Arambula, Councilmember

Jerry Jones, Councilmember

Yadira Altamirano, Councilmember

City Manager's Office

Lydia Romero, City Manager

Mike James, Assistant City Manager/Public Works Director

Community Development Department

Noah Alvey, Community Development Manager

Mike Viglione, Associate Planner

Daniell Shirazi, Planning Intern

Ascent Environmental

Honey Walters, Principal

Poonam Boparai, Principal

Heidi Gen Kuong, Project Manager

Ricky Williams, Assistant Project Manager

Alyssa Way, Planner

Corey Alling, Communications Specialist

Michele Mattei, Document Production Specialist

Energy Policy Initiatives Center (EPIC) – University of San Diego

Scott Anders, Director

Nilmini Silva-Send, PhD, Assistant Director/Adjunct Professor

Yichao Gu, Technical Policy Analyst

San Diego Association of Governments (SANDAG)

Anna Lowe, Senior Regional Energy/Climate Planner

Katie Hentrich, Associate Regional Energy/Climate Planner

Maggie Soffel, Associate Regional Energy/Climate Planner

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List of Abbreviations

°F	degrees Fahrenheit
2017 Scoping Plan	California Air Resources Board's 2017 Climate Change Scoping Plan
AB	Assembly Bill
AFV	alternative fuel vehicle
APG	Adaptation Planning Guide
BAU	business-as-usual
BEV	battery electric vehicle
CAA	Federal Clean Air Act
CAFE	Corporate Average Fuel Economy
CalGreen	California Green Building Standards
CalOES	California Office of Emergency Services
CalRecycle	California Department of Resources and Recycling and Recovery
CAP	Climate Action Plan
CARB	California Air Resources Board
CCA	Community Choice Aggregation
CCI	California Climate Investments
CDBG	Community Development Block Grant
CDC	Center for Disease Control
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Lemon Grove
CM	City of Lemon Grove City Manager's Office
CNRA	California Natural Resources Agency
CO_2	carbon dioxide
DVSP	City of Lemon Grove Downtown Village Specific Plan
EEM	Energy Efficient Mortgage
Energy Roadmap	City of Lemon Grove Energy Roadmap
Eng	City of Lemon Grove Engineering Department
EO	Executive Order
EPIC	Energy Policy Initiatives Center
EV	electric vehicle
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GUHSD	Grossmont Union High School District
GWP	global warming potential
HERO	Home Energy Renovation Opportunity program
HPS	high pressure sodium

HUD	U.S. Department of Housing and Urban Development
in.	inches
LED	light-emitting diode
LGSD	Lemon Grove School District
MHMP	Multijurisdictional Hazard Mitigation Plan
MW	megawatt
MWD	Metropolitan Water District of Southern California
MWh	megawatt-hour
MPO	Metropolitan Planning Organization
$MTCO_2e$	metric tons of carbon dioxide equivalent
MTS	San Diego Metropolitan Transit System
N_2O	nitrous oxide
NFIP	National Flood Insurance Program
O_3	ozone
OBF	On-Bill Financing
PACE	Property Assessed Clean Energy
PFC	perfluorocarbons
PW	City of Lemon Grove Public Works Department
RCP	Representative Concentration Pathways
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas & Electric
SF_6	Sulfur hexafluoride
SGC	Strategic Growth Council
SLCP	short-lived climate pollutant
sq. ft.	square feet
State	State of California
TDM	transportation demand management
UHIE	Urban Heat Island Effect
VMT	vehicle miles traveled
WELO	Water Efficient Landscape Ordinance
ZEV	zero-emissions vehicle

Glossary

Term	Definition
2017 Climate Change Scoping Plan	On December 14, 2017, the California Air Resources Board adopted the 2017 Climate Change Scoping Plan Update, which lays out the framework for achieving the State's 2030 greenhouse gas reductions goals. The Plan includes strategies that aim to lower GHG emissions, support a clean energy economy, provide equitable adaptation to ensure less pollution for all communities, improve public health, and improve natural and working lands.
Adaptation Planning	Adaptation planning is a process for identifying climate change impacts on a jurisdiction and developing strategies to help a community prepare for, respond to, and adapt to these impacts.
Business-As-Usual Emissions Projections	The business-as-usual emissions projection assumes that no additional greenhouse gas reduction efforts (e.g., regulations, climate action plans) beyond what have already been adopted by regulatory agencies would occur.
Cal-Adapt	Cal-Adapt is a climate adaptation planning tool, which assists local planning efforts by allowing users to identify potential climate change risks in specific geographic areas throughout California.
City of Lemon Grove	The City of Lemon Grove (City) is a diverse community of more than 26,000 residents, located a few miles east of the City of San Diego. The City was incorporated in 1977 and is governed by a five-member City Council elected at large.
Climate Action Plan	A Climate Action Plan is a plan prepared by an entity to reduce greenhouse gas emissions and identify climate change adaptation strategies to be implemented by the entity.
Co-Benefits	Co-benefits are environmental or economic outcomes that occur as a result of greenhouse gas reduction measures and strategies.
Downtown Village Specific Plan	In 2012, the City of Lemon Grove updated the Downtown Village Specific Plan which provides a policy and regulatory bridge between the General Plan and individual projects in the downtown village area. The downtown village area covers approximately 58 gross acres and includes primarily a mix of retail and offices uses.

General Plan	The City of Lemon Grove General Plan provides a vision for future growth and development. The General Plan identifies the community's land use, transportation, environmental, economic, and social goals and policies as they relate to land use and development.
Global Climate Change	Human-caused emissions of greenhouse gases above natural ambient concentrations are responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the Earth's climate, known as global climate change.
Greenhouse Gases	A greenhouse gas is a type of gas that causes heat to be trapped in the atmosphere, resulting in warming effects for the Earth.
Greenhouse Gas Inventory	A greenhouse gas inventory provides a snapshot of emissions generated by community and municipal activities in a given year and provides a baseline from which emissions trends are projected.
Implementation Strategy	An implementation strategy determines the priority of strategies based on a variety of factors including cost, staff resources needed, ease of implementation, and timeframe.
Local Emissions Gap	The local emissions gap refers to reductions needed at the local level to achieve targets for each year after accounting for legislative adjustments.
Legislatively-Adjusted Business-As-Usual Projections	Legislatively-Adjusted business-as-usual projections account for a variety of approved federal and State legislative actions that will further reduce business-as-usual emissions in the City.
Reduction Targets	Consistent with the 2017 Scoping Plan targets, the Climate Action Plan sets target levels for local greenhouse gas reductions by 2020 and 2030. These targets would reduce emissions generated by community activities to four percent below 2012 levels by 2020 and 42 percent below 2012 levels by 2030.
Reduction Strategies and Measures	Greenhouse gas reduction strategies and measures aim to close the gap between the City's anticipated legislatively-adjusted business-as-usual emissions and the reduction targets.
Sage Project	The Sage Project is a partnership between San Diego State University and a local government in the San Diego region. San Diego State University connects students and faculty with community projects identified by the partner local government. San Diego State University partnered with the City of Lemon Grove for the 2016-2017 academic year Sage Project.

San Diego Forward: The Regional Plan	Every four years, SANDAG prepares a Regional Plan in collaboration with the 18 cities and County of San Diego, along with regional, State, and federal partners. The Regional Plan identifies the transportation needs and improvements that would support future regional growth.
Sustainable Communities Strategy	All Metropolitan Planning Organizations in California are required to adopt a Sustainable Communities Strategy, or Alternative Planning Strategy, showing prescribed land use allocations in the Regional Transportation Plan.
United Nations Guiding Principles	In 2015, the United Nations published the *Guiding Principles for City Climate Action Planning* which sets forth eight "guiding principles" for climate action planning that should be integrated into local climate action plans.

Executive Summary

This Climate Action Plan (CAP) provides a comprehensive roadmap to address the challenges of climate change in the City of Lemon Grove (City). Acting on climate change means both reducing greenhouse gas (GHG) emissions from activities within the City and helping the community to adapt to climate change and improve its resilience over the long term. Climate change is a global issue that relies on the critical role of members of society, including local governments. The City has dedicated resources and partnered with the San Diego Association of Governments (SANDAG) to create this CAP and is committed to environmental stewardship by reducing GHG emissions at the community level. This CAP establishes GHG emission targets and identifying achievable, locally-based actions to reduce GHG emissions from municipal and community activities.

Source: City of Lemon Grove

Scientific evidence shows that the Earth's climate is experiencing a warming trend. The warming is a result of increasing GHGs in the atmosphere. Increasing average temperatures are also causing changes in the climate, including extreme weather and changes in precipitation; this phenomenon is known as global climate change. As California continues to experience historic trends of rising average temperatures, warmer storms, and higher sea levels, there is evidence that the effects of global climate change are already occurring and that reductions in GHG emissions are needed to prevent the most catastrophic effects of climate change.

This CAP aims to address climate change by reducing GHG emissions from activities within the City, and identifying strategies for adapting to future environmental conditions cause by climate change.

The State has also taken several steps to reduce GHG emissions and respond to the threat of global climate change. In 2006, the California Global Warming Solutions Act (Assembly Bill [AB] 32) established the State's first target to reduce GHG emissions, which set a goal of lowering emissions to 1990 levels by 2020. According to the California Air Resources Board (CARB), California has been making steady progress and is expected to achieve the 2020 target. In 2016, Senate Bill (SB) 32 was signed into law, which codified into statute the mid-term GHG reduction target of 40 percent below 1990 levels by 2030, established by Executive Order (EO) B-30-15. This 2030 target places California on a trajectory towards meeting its longer-term goal, which is to bring emissions down to 80 percent below 1990 levels by 2050. EO B-55-18, signed in September 2018, furthers California's efforts to reduce GHG emissions by setting a goal to achieve carbon neutrality by 2045 and achieve net negative GHG emissions thereafter.

This CAP includes strategies to improve the City's resilience to potential environmental risks and hazards over the long term. These strategies provide the City with programs and policies that would be implemented to reduce the effects of and adapt to global climate changes on the community.

Key Components of Climate Action Planning

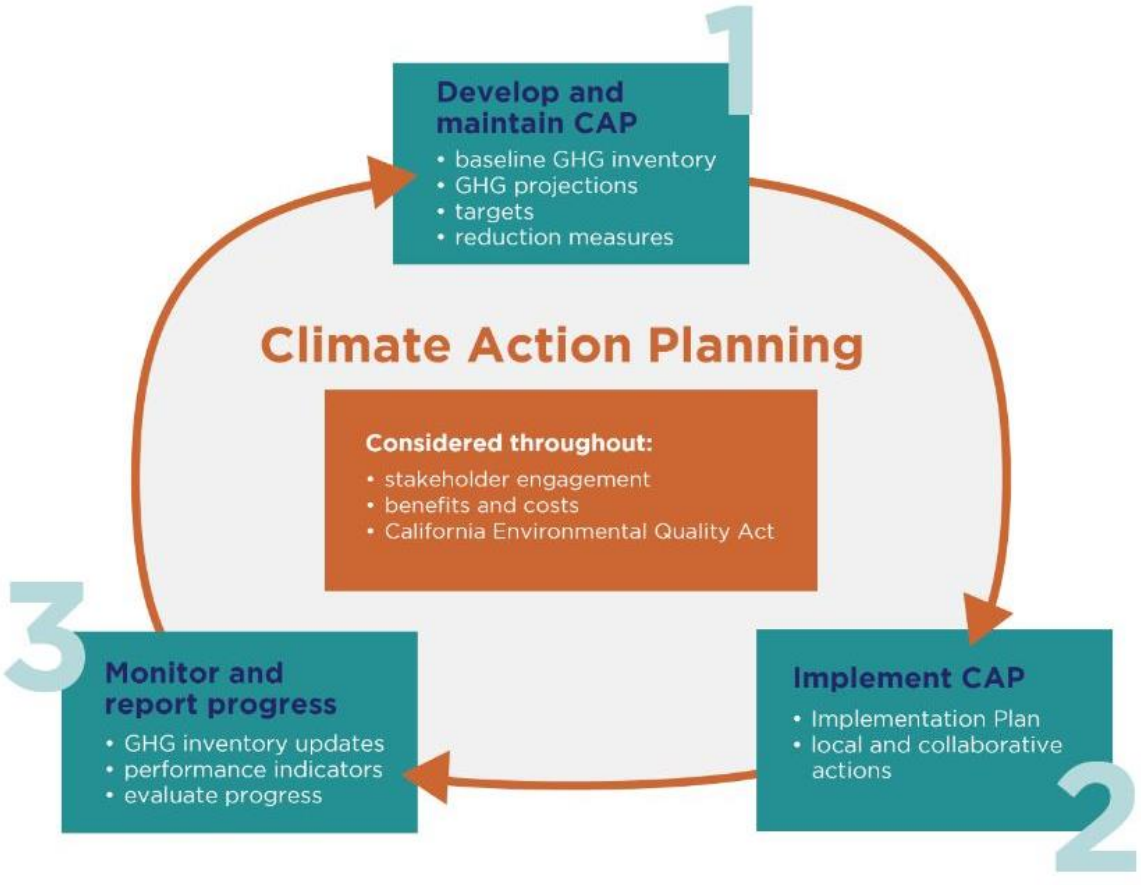
The climate action planning process is undertaking in three main steps:

Step 1: Develop and Maintain a CAP, which includes preparing baseline emissions estimates and projections and developing reduction targets and strategies.

Step 2: Implement the CAP through local measures.

Step 3: Monitor and Report Progress on CAP implementation and identify improvements or adjustments that can be made to the plan in the future.

Adoption of a CAP marks the beginning of an interactive process of maintaining, implementing, monitoring, and updating the CAP. Over time, the City will continue to repeat the iterative process by updating this CAP as new technologies, information, and inventories become available. The key components of the climate action planning process are summarized below and shown graphically in **Figure ES-1**.



Source: SANDAG 2018.

Figure ES-1 **The Climate Action Planning Process**

Step 1: CAP Development

Development of the CAP consists of setting a baseline inventory of citywide GHG emissions, projecting GHG emissions into future years, setting GHG reduction targets, and identifying strategies and measures the City will implement to achieve these targets. In developing this CAP, the City is committed to demonstrating consistency with the climate action planning guiding principles in the United Nations *Guiding Principles for City Climate Action Planning* (UN 2015).

Baseline GHG Inventory

A GHG inventory is a snapshot of the emissions associated with a community's various activities in a given year. A baseline GHG emissions inventory was prepared for 2012; the inventory is consistent with guidance in CARB's 2017 *Climate Change Scoping Plan* and uses the same base year (2012) as SANDAG's Series 13 Regional Growth Forecast. In 2012, community activities in the City accounted for 129,400 metric tons of carbon dioxide equivalent ($MTCO_2e$). On-road transportation sources (e.g., vehicular gasoline and diesel consumption) accounted for 55 percent of citywide baseline emissions, and energy sources (e.g., electricity and natural gas consumption in buildings) accounted for an additional 44 percent. The 2012 baseline inventory is used to forecast emissions and set targets for emissions reductions based on State goals, as described in detail in **Chapter 2**.

Source: City of Lemon Grove

Projections and Reduction Targets

Citywide emissions projections were modeled based on a continuation of current trends in activity, population, and job growth. The business-as-usual (BAU) conditions provides estimates of future citywide emissions assuming no changes in citywide activities. Based on trend data, the City would experience a decrease in emissions through 2020 under BAU conditions to 14 percent below 2012 baseline levels. This decrease is primarily due to the federal and State actions that have resulted in GHG reductions locally. Citywide emissions under BAU conditions would steadily rise after 2020 through 2030, but would still be 13 percent below 2012 baseline levels.

Federal and State actions that are planned to take place in the future would further reduce the City's projected emissions when applied across the various GHG emissions categories. This projection, with the application of legislative actions that would reduce local GHG emissions, is referred to as the Legislatively-Adjusted BAU condition. The City's emissions would be 18 percent below 2012 baseline levels in 2020 with legislative actions, and 36 percent below 2012 baseline levels in 2030.

Consistent with CARB's recommendations for community-wide targets, reduction targets were derived for the CAP using a mass emissions approach. These targets, to be achieved through the implementation of the CAP, are to reduce the citywide GHG emissions by four percent below 2012 levels by 2020 and by 42 percent below 2012 levels by 2030. A summary of the projections and targets is shown below in **Table ES-1**. Further descriptions of the methodology used for calculating each projection and City reduction targets are provided in **Chapter 2**.

Table ES-1 Greenhouse Gas Emissions Projections and Targets

Projection	2012 Baseline Emissions ($MTCO_2e$)	2020		2030	
		Total Emissions ($MTCO_2e$)	Change from 2012 Baseline (%)	Total Emissions ($MTCO_2e$)	Change from 2012 Baseline (%)
BAU	129,400	111,100	-14	112,800	-13
Legislatively-Adjusted BAU	--	105,800	-18	82,800	-36
Reduction Targets	--	124,400	-4	75,000	-42

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: EPIC 2019.

Reduction Strategies and Measures

The City would meet its 2020 emissions reduction target under BAU conditions, based on existing activities and trends. However, to meet the City's 2030 reduction target, additional actions beyond those implemented at the federal and State level are required. To meet the City's 2030 target, this CAP identifies strategies and measures to reduce GHG emissions citywide from a variety of emissions categories. In total, the City will implement eight strategies, listed below in **Table ES-2**, with one or more measures associated with each.

Table ES-2 Strategies for Reducing Greenhouse Gas Emissions

Strategy	Description
Strategy 1	Increase the Use of Zero-Emission or Alternative Fuel Vehicles
Strategy 2	Reduce Fossil Fuel Use
Strategy 3	Reduce Vehicle Miles Traveled
Strategy 4	Increase Building Energy Efficiency
Strategy 5	Increase Renewable and Zero-Carbon Energy
Strategy 6	Increase Water Efficiency
Strategy 7	Reduce and Recycle Solid Waste
Strategy 8	Carbon Sequestration

Source: EPIC 2019.

Detailed measures were identified within each strategy by assessing the feasibility of implementation and potential co-benefits. Where strategies represent the high-level plans implemented to achieve reductions in each emissions category, measures provide specific actions the City will implement to achieve potential GHG emissions reductions associated with each measure. This CAP includes a total of 25 measures aimed at reducing GHG emissions from five emissions categories. The five measures included in this CAP that would result in the most significant GHG reductions include:

Measure S-1: The City will work with the local franchise waste hauler to achieve a citywide solid waste diversion rate from 51 percent in the baseline year to 80 percent by 2030, reducing citywide emissions by approximately 2,800 $MTCO_2e$ in 2030.

Measure E-7: The City will participate in a community choice aggregation, or similar program to increase grid-supply renewable and zero-carbon electricity supply to 75 percent by 2030, reducing citywide emissions by approximately 1,900 $MTCO_2e$ in 2030.

Measure T-13: The City will develop programs aimed at increasing the number of commuters to college and work that use transit to and from the City, reducing the citywide emissions by approximately 1,300 $MTCO_2e$ in 2030.

Measure T-11: The City will modify existing requirements and reduce the number of required parking spaces in new multi-family residential developments by at least 50 percent for developments near trolley stations, reducing the citywide emissions by approximately 700 $MTCO_2e$ in 2030.

Source: City of Lemon Grove

Measure T-8: The City will adopt a transportation demand management ordinance requiring new commercial developments to increase the use of alternative modes of transportation, reducing citywide emissions by approximately 600 $MTCO_2e$ in 2030.

A detailed description of the eight strategies and 25 measures, and associated GHG emissions reduction potential, is included in **Chapter 3**.

Steps 2 and 3: Implementation and Monitoring

Implementation of the CAP will require ongoing management, oversight, and collaboration, ensuring that measures translate to real GHG emissions reductions. Successful implementation requires investment, long-term commitments, and widespread community participation. Monitoring CAP measures is an important part of ensuring the success of achieving the City's 2030 reduction target. The City will monitor progress towards the 2030 goal by participating in SANDAG's biennial update of its local GHG inventory. City staff will provide periodic updates to the City Council on CAP implementation and efforts. The City will update the CAP to ensure CAP measures remain implementable and feasible, adjusting measures based on changing conditions or demands, and incorporating new technology not considered in the previous CAPs.

Source: City of Lemon Grove

Ongoing partnerships between community residents, businesses, property owners, the City, and other agencies and organizations in the region are essential for successful implementation. On a communitywide level, individuals and businesses can play an important role in reducing GHG emissions by changing habits to produce less waste, consume less water, or using alternative modes of transportation.

Source: City of Lemon Grove

The CAP includes strategies to improve the City's resilience to potential environmental risks and hazards over the long term. Strategies are organized to reduce climate change impacts associated with increased temperatures, increased frequency of extreme heat events and heat waves, changes in precipitation patterns and water availability, increased likelihood of flooding, and increased wildfire risk. Included within each adaptation strategy are programs and policies to support climate adaptation and resiliency, with a focus on specific vulnerabilities and impacts that have the potential to affect the community's populations, functions, and structures. A detailed discussion of the City's adaptation strategies and vulnerabilities is included in **Chapter 4**.

Implementation and monitoring mechanisms are identified in the CAP to ensure that all strategies and measures are implemented, and reduction targets achieved. These steps complete the cyclical process of climate action planning and provide the necessary information and feedback used to repeat and improve the process. A detailed description of the City's implementation and monitoring efforts and the importance of continued community engagement and outreach is outlined in **Chapter 5**.

01 Introduction

The City of Lemon Grove (City) Climate Action Plan (CAP) sets forth strategies and measures to reduce greenhouse gas (GHG) emissions from communitywide and municipal activities. The CAP is intended to meet State targets to reduce GHG emissions and establishes locally-based strategies and measures that focus on reducing GHG emissions, while also improving the livability and quality of life in the City. Though climate change is a global issue, it requires the efforts of local governments to reduce GHG emissions in their communities. In addition to identifying ways to reduce GHG emissions, the City has identified strategies to adapt to climate change and improve resilience over the long-term that focus on vulnerabilities and impacts of climate change that have the potential to affect the community's populations, functions, and structures.

1.1 Climate Action Plan Overview

The CAP provides the City with a roadmap to address two climate change challenges: to reduce GHG emissions from activities within the City and to improve its resilience to climate change over the long term.

The effects of global climate change are already occurring as California continues to experience rising average temperatures, warmer storms, and higher sea levels. The impacts of climate change vary across the State due to its diverse biophysical setting, climate, and community characteristics. While projections generally show little change in total annual precipitation statewide, even modest changes could have significant effects on the State's ecosystem. At a local level, annual temperatures are projected to steadily increase over time. At the same time, average precipitation levels are projected to remain relatively the same; however, this precipitation is expected to result from fewer, but more intense storms (CEC 2019). These changes could result in increased heat waves, wildfire risk, and flooding, resulting in adverse effects on human health and safety, economic prosperity, infrastructure capacity and maintenance, and provision of public services in the City.

This CAP sets forth strategies and measures designed to reduce GHG emissions consistent with the State's 2030 GHG reduction target and demonstrate progress towards the 2050 reduction goal. Technologies and markets are constantly changing how we approach and reduce the impacts of climate change. This CAP uses the best information, research, and technology currently available. The City will update the CAP to stay in step with new technologies that do not yet exist, and new State and federal laws, as outlined in **Chapter 5**, Implementation and Monitoring. The overarching goals of the CAP remain the same: to reduce GHG emissions and prepare for and adapt to climate change.

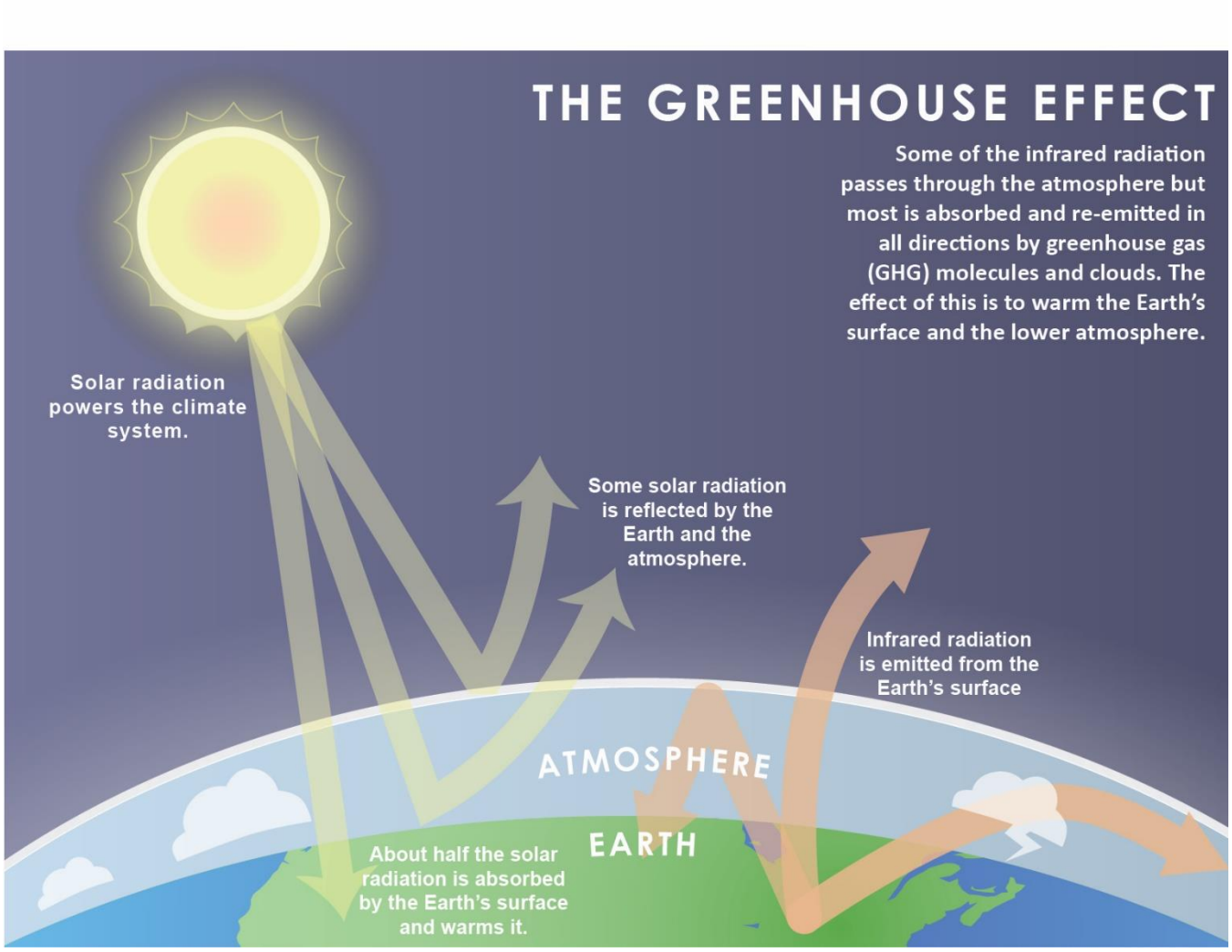
Source: City of Lemon Grove

This CAP represents an important step in acknowledging global climate change effects on the City. The document is divided into five chapters. **Chapter 1** provides an overview and introduction to the regulatory framework. **Chapter 2** summarizes the City's GHG emissions that are contributing to global warming. **Chapter 3** includes a description of strategies and measures the City will implement to reduce local GHG emissions. **Chapter 4** evaluates the City's vulnerability to climate change and current and future strategies the City is implementing to adapt to climate change impacts.

Chapter 5 provides an outline for how the City will implement the GHG reduction strategies and includes guidelines for monitoring and updating the CAP.

1.2 Introduction to Climate Change Science

The greenhouse effect, as outlined below in Figure 1-1, results from a collection of atmospheric gases called GHGs that insulate the Earth and help regulate its temperature. These gases, mainly water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone, and chlorofluorocarbons all act as effective global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth conducive to life. Without the greenhouse effect, Earth would not be able to support life as we know it.



Source: Ascent Environmental 2019.

Figure 1-1 The Greenhouse Effect

Human activities (e.g., burning of fossil fuels for transportation and energy, increasing rates of deforestation and development) have contributed to the elevated concentration of these gases in the atmosphere. Human-caused (i.e., anthropogenic) emissions of GHGs above natural ambient concentrations are responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the Earth's climate, known as global climate change, or global warming. There is scientific consensus that it is "extremely likely" that most of the changes in the world's climate during the last 50 years are a result of anthropogenic GHG emissions (IPCC 2014).

Source: City of Lemon Grove

Furthermore, short-lived climate pollutants, which are GHGs that remain in the atmosphere for a much shorter period than long-lived climate pollutants (e.g., CO_2 and N_2O), are also powerful climate forcers that have an outsized impact on climate change in the near term. Despite their relatively shorter atmospheric lifespan, short-lived climate pollutants' relative potency in terms of how they heat the atmosphere (i.e., global warming potential) can be tens, hundreds, or even thousands of times greater than that of CO_2. Short-lived climate pollutants include CH_4; fluorinated gases, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride; and black carbon.

1.3 Regulatory Framework

In response to the threat of global climate change, the State and City have already taken several steps to both reduce GHG emissions and adapt to climate change. These efforts, briefly summarized below, provide important policy direction and context for the CAP.

1.3.1 Federal and State Regulations

In 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, which directed California to reduce GHG emissions to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. A year later, in 2006, the Global Warming Solutions Act (Assembly Bill [AB] 32) was passed, establishing regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions. AB 32 put a cap on GHG emissions, setting a target of reducing GHG emissions to 1990 levels by 2020. As part of its implementation of AB 32 and Executive Order S-3-05, the California Air Resources Board (CARB) developed a Scoping Plan in 2008. The Scoping Plan, along with its Update in 2014, describes the approach California will take to reduce GHGs to achieve reduction targets and goals. California is currently on track to meet or exceed the AB 32 target of reducing GHG emissions to 1990 levels by 2020.

On April 20, 2015, Governor Edmund G. Brown Jr. signed Executive Order B-30-15, establishing a new GHG emissions reduction target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. Executive Order B-30-15 also directed CARB to update the AB 32 Scoping Plan to reflect the path to achieving the 2030 target. In September 2016, Governor Brown

also signed Senate Bill (SB) 32, which codified into statute the mid-term 2030 target established by Executive Order B-30-15. The 2030 GHG emissions reduction target places California on a trajectory towards meeting the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050. Executive Order B-55-18, signed in September 2018, furthers California's efforts to reduce GHG emissions by setting a goal to achieve carbon neutrality by 2045 and achieve net negative GHG emissions thereafter.

California aims to reduce annual GHG emissions Statewide to:

- **1990 levels by 2020;**
- **40 percent below 1990 levels by 2030; and**
- **80 percent below 1990 levels by 2050.**

In November 2017, CARB published the *2017 Climate Change Scoping Plan* (2017 Scoping Plan), which lays out the framework for achieving the 2030 reductions as established in Executive Order B-30-15 and SB 32. The 2017 Scoping Plan identifies GHG reductions by emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels by 2030.

In addition to legislation setting statewide GHG reduction targets, SB 375, signed by Governor Schwarzenegger in 2008, better aligned regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocations in each MPO's Regional Transportation Plan (RTP). CARB, in consultation with the MPOs, provides each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

To effectively address the challenges that a changing climate will bring, the State also prepared the 2009 California Climate Adaptation Strategy, which highlights climate risks and outlines possible solutions that can be implemented throughout California. This Strategy was updated in 2014 and is now known as *Safeguarding California*. In 2015, the State also developed the *Safeguarding California Implementation Action Plans*.

Source: City of Lemon Grove

Other relevant federal and State regulations relevant to the CAP are identified below:

Table 1-1 Relevant Federal and State Regulations		
Federal	Federal Clean Air Act (CAA)	In 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the CAA, and the U.S. Environmental Protection Agency has the authority to regulate emissions of GHG.
Federal	Corporate Average Fuel Economy (CAFE) Standards	The federal CAFE Standards determine the fuel efficiency of certain vehicle classes in the U.S.
State	SB 97	The State Office of Planning and Research prepared, and the Natural Resources Agency adopted amendments to the State California Environmental Quality Act (CEQA) Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines Section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
State	Executive Order S-21-09	Executive Order S-21-09, signed in 2009, directed CARB, under its AB 32 authority, to adopt a regulation by July 31, 2010 that sets a 33 percent renewable energy target as established by Executive Order S-14-08.
State	Executive Order S-01-07	Executive Order S-01-07, signed in 2007, set forth a low carbon fuel standard for California, whereby the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.
State	California Building Efficiency Standards Title 24 Part 6	The California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.
State	AB 1493	AB 1493 (Pavley), signed into law in 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks.
State	AB 197	AB 197 (Garcia), signed into law in 2016, creates a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing GHGs at the local level.

State	SB 350	SB 350, signed into law in 2015, requires the State to set GHG emission reduction targets for the load serving entities through Integrated Resource Planning. SB 350 requires an increase in the Renewables Portfolio Standard to 50 percent by 2030 and doubling energy savings in electricity and natural gas end uses.
State	Advanced Clean Cars Program	In January 2012, CARB approved the Advanced Clean Cars program, which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025.
State	SB X1-2	SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 mandates that renewables supplied to the California grid from sources within, or directly proximate to, California make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.
State	SB 100	SB 100, singed into law in 2018, provides an update to SB X1-2 and requires California's renewable energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers and 100 percent of electricity procured to serve state agencies by 2045.

1.3.2 San Diego Association of Governments

SANDAG is the public agency that serves as the MPO for the San Diego region. SANDAG adopted *San Diego Forward: The Regional Plan* that integrates the RTP and SCS in October 2015 in response to SB 375.

SANDAG is currently working with local jurisdictions to help identify opportunities to reduce GHGs related to local operations through the Roadmap Program. Since 2010, the Roadmap Program has provided member agencies with voluntary, no-cost energy assessments known as "Energy Roadmaps." Each Energy Roadmap provides strategies, unique to each local government, to reduce energy use in municipal operations and in the community. The Roadmap Program is primarily funded by San Diego Gas & Electric and was expanded to include climate planning in 2016.

1.3.3 City of Lemon Grove

The City is actively engaged in climate planning at the local level through plan updates and implementation, municipal projects, and outreach and educational efforts. These activities are complimentary to the CAP and provide the baseline for sustainability activities occurring at the municipal and community levels. Climate planning and sustainability-related activities within the City have included:

General Plan Update. The City is currently in the process of updating its General Plan. The City's General Plan provides a vision for the future and identifies community land use, transportation, environmental, economic, and social goals and policies. The General Plan includes guiding principles the City will follow to protect and/or use natural resources in a sustainable manner, including water, air quality, energy, and biological resources.

Source: City of Lemon Grove

Downtown Village Specific Plan. The City adopted an update to the Downtown Village Specific Plan (DVSP) in 2012. This plan, which provides a bridge between the land use regulations in the downtown village and the City's General Plan, identifies the vision for the Downtown Village and Civic Center area, which serves as the primary activity center in the City. The DVSP provides land use changes and goals that encourage higher density, pedestrian friendly, and transit-oriented development.

Energy Roadmap. In 2014, the City prepared the *City of Lemon Grove Energy Roadmap* (Energy Roadmap) through the SANDAG Roadmap Program. The City's Energy Roadmap provides a framework to identify ways to save energy in government operations and in the community and includes wide-ranging, cost-effective opportunities to save electricity, natural gas, and transportation fuels.

Water Reduction Measures. The City has implemented multiple measures that reduce water consumption in municipal areas and increased landscaped areas to reduce stormwater runoff. In addition to the development and approval of the City's *Best Management Practices Design Manual,* which provides best practices for developments to reduce stormwater runoff, specific activities that have occurred in the City include:

- Replacement of hardscape along medians with decomposed granite and landscaping to reduce stormwater runoff.
- Replacement of standard irrigation controllers with smart controllers at municipal facilities to reduce water consumption in landscaped areas.
- Addition of rainwater capture devices at Civic Center Park, directing captured rainwater to landscaped areas and reducing overall water consumption.

Renewable Energy. The City has worked with existing homeowners to install photovoltaic systems on residential roofs, increasing the percentage of renewable energy generated citywide.

San Diego State Sage Project. During the 2016-2017 school year, the City partnered with San Diego State University to develop projects and plans through the Sage Project. Through this project, faculty and students, in partnership with City staff, developed projects to address social, economic, and environmental goals for the City. The Sage Project included 37 individual projects developed by

faculty and staff with sustainability focuses, including community garden feasibility plans, climate action vulnerability assessments, and marketing materials and support.

1.4 Purpose and Objectives

The City's CAP organizes strategies and measures based on emissions categories evaluated in the 2012 GHG emissions inventory. These categories include: on-road transportation, off-road transportation, electricity, natural gas, solid waste, water, and wastewater. Strategies were developed to target improving the GHG efficiency of communitywide and municipal activities. The CAP is an important document that acknowledges global climate change and its effects on the City. The overarching goals of the City's CAP are to reduce GHG emissions and identify adaptation measures for City government, businesses, and residents.

1.4.1 GHG Reduction Targets and Measures

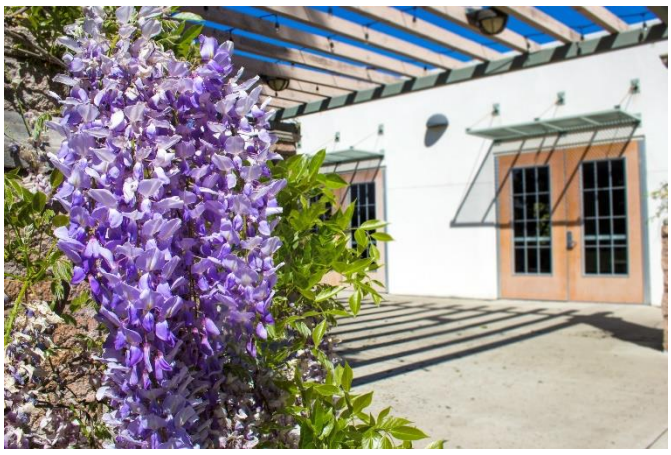
As discussed in greater detail in **Chapters 2** and **3**, the City's GHG emissions inventory performed for the 2012 baseline year demonstrated that activities within the City emitted 129,400 metric tons of carbon dioxide equivalent. The GHG reduction targets for the CAP have been established in accordance with CARB's 2017 Scoping Plan recommendations for developing community-wide, plan-level reduction targets. Consistent with the Scoping Plan targets, the City must achieve the following reductions from 2012 levels:

- 4 percent below 2012 levels by 2020; and
- 42 percent below 2012 levels by 2030.

To achieve these targets, the City's CAP identifies a summary of baseline GHG emissions and the potential growth of these emissions over time, GHG emissions reduction targets and goals to reduce the community's contribution to global climate change, and identification and evaluation of strategies and measures to reduce GHG emissions.

1.4.2 Implementation Strategy

Meeting GHG reduction targets represents a challenge that will require significant City investments, long-term commitment, and the widespread participation of residents and business owners. Implementation will be dependent on the City adopting future implementing ordinances, policies, and programs, as well as evaluating the costs and benefits associated with the implementation of each measure. Meeting reduction targets will require continued collaboration among all City departments, as well as private, non-profit, and educational partners.



Source: City of Lemon Grove

Chapter 4 provides a high-level discussion of relative implementation costs and responsible departments. As the City allocates funding or identifies timelines for the implementation of each measure, action plans will be developed providing the framework for specific measure

implementation, including quantified costs, department/partner responsibilities, specific tasks to be achieved, and dates for task completion.

1.4.3 United Nations Guiding Principles

Published by the United Nations (UN) in 2015, *Guiding Principles for City Climate Action Planning* aims to help cities reduce GHG emissions and adopt low emission development trajectories, as well as to adapt to the impacts of climate change and build local climate resilience. This framework sets forth eight "guiding principles" for climate action planning that are recommended to be integrated into local climate action plans. The eight guiding principles state that climate action planning should be:

Ambitious 	Setting goals and implementing actions that evolve iteratively towards an ambitious vision
Inclusive 	Involving multiple City government departments, stakeholders, and communities (with particular attention to marginalized groups), in all phases of planning and implementation.
Fair 	Seeking solutions that equitably address the risks of climate change and share the costs and benefits of action across the City.
Comprehensive and Integrated 	Coherently undertaking adaptation and mitigation actions across a range of sectors within the City, as well as supporting broader regional initiatives and the realization of priorities of higher levels of government when possible and appropriate.
Relevant 	Delivering local benefits and supporting local development priorities.
Actionable 	Proposing cost-effective actions that can realistically be implemented by the actors involved, given local mandates, finances, and capabilities.

Evidence-Based

Reflecting scientific knowledge and local understanding, and using assessments of vulnerability and emissions and other empirical inputs to inform decision-making.

Transparent and Verifiable

Following an open decision-making process, and setting goals that can be measures, reported, independently verified, and evaluated.

The City is committed to demonstrating commitment to the reduction of global GHG emissions through this CAP. Each of the UN guiding principles are highlighted throughout this CAP, providing context for the relationship between the information presented and the relevant guiding principles.

1.5 Co-Benefits

While the measures included in the CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic "co-benefits." Environmental co-benefits can include improvements to air quality, water supplies, and biological resources, public health outcomes, and beneficial outcomes for other resources. Additional co-benefits identified in the CAP include:

Co-Benefits identified in the CAP:
- **Improved Air Quality**
- **Improved Public Health**
- **Increased Non-Motorized Transportation**
- **Reduced Fossil Fuel Reliance**
- **Energy Efficiency/Reduced Energy Demand**
- **Increase Renewable Energy**

- Improved air quality as a result of reducing the number of miles traveled in vehicles and associated fuel combustion.
- Increased energy efficiency in buildings and increased use of renewable energy sources resulting in reduced building heating and cooling costs and fossil fuel use.
- Improved public health through encouraging alternative transportation modes that allow people to drive less, save money, and enjoy a better quality of life.
- Enhanced community character and improved air quality from increased tree plantings in City rights-of-way, other public spaces, and new private developments.

In addition to these co-benefits, the CAP provides for other benefits to the City, including improved local control. The CAP allows the City to maintain control over GHG reduction strategies that are most advantageous to the City, while also promoting economic competitiveness and positioning the City for competitive grant funding. The CAP also demonstrates that the City is aligned with State targets for reducing GHG emissions. Further, co-benefits of reducing air pollution can be an important element of climate change policy, making these policies effectively cheaper by removing the need for additional policies or technologies to filter out air pollutants. More detailed discussion of reduction strategies and their co-benefits is included in **Chapter 3**.

1.6 Community Action and Public Involvement

While global change is happening worldwide, local efforts to reduce human-induced GHG emissions and build resilience in the face of adverse climate change effects can make a difference. Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. By beginning to plan now and engage in more sustainable practices, communities will be better suited to adapt to climate change and be more resilient in the future.

1.6.1 Community Action

At the regional and local scale, individuals and businesses can play an important role in combating climate change. By changing habits to consume less energy, producing less waste through recycling, conserving water, composting, and driving less by choosing to carpool, take transit, or walk and bike more frequently, individuals and businesses can work towards reducing their carbon footprint. The combination of these small efforts can lead to better outcomes for the environment and the City.

Source: City of Lemon Grove

Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. The CAP serves as a resource and starting point to support long term sustainability efforts. The City is committed to implementing the measures in the CAP to advance equality and reduce disparities. Opportunities to participate and share the benefits of the City's measures will be inclusive for all City residents.

1.6.2 Summary of Public Involvement

As part of this CAP, the City hosted a series of public workshops and outreach events providing residents, stakeholders, interested parties, and other agencies and/or individuals with the opportunity to participate in the climate action planning process. At the time of writing this CAP, City Staff participated in 12 public outreach events. These public outreach events were conducted to provide information to residents and businesses about the CAP and its development, and to gather input on CAP goals and GHG reduction strategies. CAP informational materials were created by City Staff and distributed at outreach events to community members, and surveys targeting both adults and children were administered to identify community perspective. To date, outreach events have taken place near public transit stations during morning commute hours (i.e., 7:30 a.m. to 8:30 a.m.), in front of large commercial centers in the City, and at community events such as Concerts on the Green and the Health Fair. The City will continue to conduct outreach events to gather public input prior to the publication of the Final CAP, which will be presented to City Council. City Staff will update this section after all public outreach has been completed and survey results have been reviewed. This section will include specific details about major outreach events, common perspectives of City residents gathered at outreach events, and a summary of the survey and collected responses.

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02 Greenhouse Gas Emission Inventory, Projections, and Targets

This chapter summarizes the accounting of greenhouse gas (GHG) emissions within the City of Lemon Grove (City). It includes a discussion of the primary sources and annual levels of GHG emissions for the 2012 baseline year, describes likely trends if emissions are not reduced for 2020 and 2030, and sets a path forward to reduce emissions by establishing targets for 2030.

2.1 Purpose of the Inventory

Preparing a GHG emissions inventory is an important first step in the climate action planning process. The inventory provides a snapshot of emissions generated by community and municipal activities in a given year and provides a baseline from which emissions trends are projected. The City's inventory and projections are used to develop reduction targets consistent with State mandates. The resulting gap, referred to as the "emissions gap," between forecasted emissions and reduction targets serves as the foundation to determine the strategies and measures needed to reduce GHG emissions to meet the 2030 target.

Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Orders B-30-15 and S-3-05 use 1990 emissions levels as a benchmark to identify statewide reduction targets. The City's Climate Action Plan (CAP) includes targets developed proportionally based on a 2012 baseline inventory in the absence of 1990 emissions data. This is consistent with the guidance provided by the California Air Resources Board (CARB) in the *2017 Climate Change Scoping Plan* (2017 Scoping Plan) and is the same baseline year as the San Diego Association of Government's (SANDAG's) Series 13 Regional Growth Forecast.

The inventory baseline is used to:

- Forecast emissions
- Develop reduction targets
- Identify necessary reduction strategies and measures

The City has included the baseline inventory and associated calculations and methodology as part of this CAP to provide **transparent and verifiable** data.

The City's GHG inventory also provides the ability to track citywide emissions over time, as the City will prepare updated GHG emissions inventories after the CAP is adopted. These updated inventories will be compared to the 2012 baseline inventory to track progress in emissions reductions resulting from CAP measure implementation.

2.2 Baseline Inventory

The baseline GHG inventory provides a detailed accounting of the sources and amounts of GHG emissions generated from activities within the City. The inventory provides an estimate of citywide emissions for a defined set of gases that contribute to climate change. The emissions inventory includes estimates of GHGs generated from five emissions categories that can be readily monitored and reduced through communitywide and municipal actions.

Three primary GHGs are quantified in the City's inventory: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These gases are converted to a comparable unit by multiplying each non-CO_2 gas by their global warming potential (GWP), reporting emissions in terms of carbon dioxide equivalent (CO_2e). This conversion allows consideration of all gases in comparable terms and makes it easier to communicate how various sources and types of GHG emissions contribute to global climate change. A metric ton of CO_2e ($MTCO_2e$) is the standard measurement of the amount of GHG emissions produced and released into the atmosphere.

Source: City of Lemon Grove

The City's GHG emissions inventory was prepared for a 2012 baseline year and includes seven emissions categories. **Table 2-1** provides a description of emissions associated with each category included in the 2012 inventory and is organized in order of total contribution to citywide GHG emissions.

Table 2-1 City of Lemon Grove Emissions Categories

Emissions Category	Description
On-Road Transportation	On-road transportation emissions associated with gasoline and diesel consumption from motor vehicles on local and regional roadways.
Electricity	Building energy use emissions associated with electricity in residential and non-residential buildings.
Natural Gas	Building energy use emissions associated with combustion of natural gas in residential and non-residential buildings.
Off-Road Transportation	Off-road transportation emissions associated with gasoline and diesel fuel use from recreational vehicles, construction equipment, and residential and commercial equipment.
Solid Waste	Waste emissions associated with waste generated by residents and businesses of the City and disposal of mixed and organic waste in landfills.
Water	Emissions associated with the water supplied, conveyed, treated, and distributed to residents and businesses within the City.
Wastewater	Wastewater treatment fugitive and process emissions consisting of GHGs from combustion of anaerobic digestor gas and operational fossil fuels.

Notes: City = City of Lemon Grove; GHG = greenhouse gas
Source: EPIC 2018.

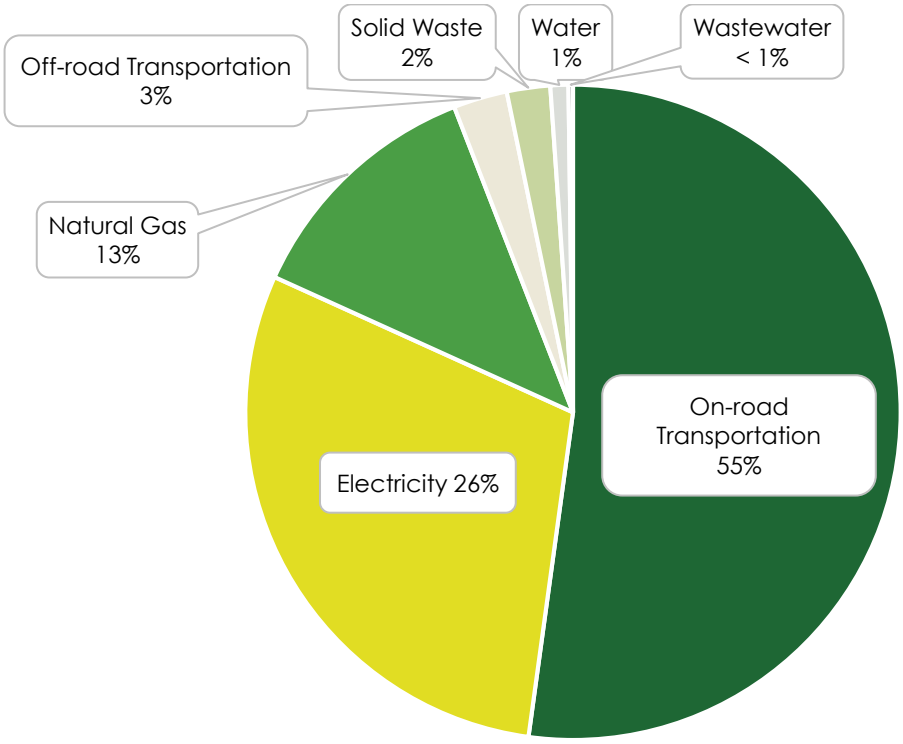
The GHG reduction strategies and measures identified in this CAP focus primarily on the City's ability to reduce inventoried emissions. However, reducing GHG emissions consistent with State goals would also require partnerships and individual efforts beyond the City's control. Daily choices made by residents, businesses, and organizations within the City result in the generation of GHG emissions

that extend beyond the influence of the City and this CAP. Individual actions, such as taking transit as an alternative to driving or composting organics instead of sending these materials to the landfill, have the ability to reduce GHG emissions beyond reductions identified in this CAP. These individual actions, along with efforts taken by the City, would combine to further reduce the local carbon footprint.

The City's 2012 GHG inventory used **evidence-based** methodologies to estimate emissions.

2.2.1 GHG Emissions Inventory

The City's 2012 baseline GHG emissions by category are shown in **Figure 2-1**. Community activities in the City in 2012 accounted for approximately 129,400 $MTCO_2e$. The primary category contributing to GHG emissions in the City is On-Road Transportation, which accounted for 55 percent of the total emissions in 2012. On-road transportation activities are primarily related to gasoline and diesel consumption in on-road vehicles on local and regional roadways. These emissions were calculated based on estimated vehicle miles traveled (VMT) for all vehicles traveling to, from, and within the City. Emissions from the electricity and natural gas categories, collectively referred to as the Energy category, account for an additional 44 percent of the City's 2012 emissions. Emissions generated in the energy category are associated with electricity and natural gas consumption in buildings within the City.



Source: EPIC 2018.

Figure 2-1 City of Lemon Grove 2012 GHG Emissions

The City's GHG emissions generated by each category in the 2012 inventory are shown in **Table 2-2**. Additional details related to specific emissions categories, data sources, assumptions, and methodology can be found in **Appendix A**.

Table 2-2 City of Lemon Grove 2012 Greenhouse Gas Emissions Inventory

Emissions Sector	$MTCO_2e$	Percent (%)
On-Road Transportation	70,700	55
Electricity	34,000	26
Natural Gas	16,700	13
Off-Road Transportation	3,600	3
Solid Waste	2,900	2
Water	1,200	1
Wastewater	300	<1
Total	**129,400**	**100**

Notes: Columns may not add to totals due to rounding.
$MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: EPIC 2019.

2.3 Emissions Projections

GHG emissions projections provide an estimate of future emission levels that are based on a continuation of current trends in activity, population and job growth, and relevant legislative actions that have already been adopted. Projections provide insights into the scale of local reductions needed to achieve the GHG emissions reduction targets, in addition to legislative actions.

Two projections are used in this CAP: "business-as-usual" (BAU) and "Legislatively-Adjusted BAU". The BAU projection assumes that no additional efforts or legislative actions will be made to reduce GHG emissions in the future. This projection also assumes that population, employment, and transportation activity will grow over time, consistent with SANDAG projections. Legislatively-Adjusted BAU projections provide a reduction from the BAU projection accounting for federal and State actions that have been adopted since the baseline year, assuming the same demographic trends as the BAU projections.

The City's emissions projections assume existing trends will continue for:

- Population growth
- Job growth
- Transportation activity

Details on how the projections were developed and the indicators used to estimate each category can be found in **Appendices A** and **B**.

2.3.1 Demographic Trends

GHG emissions forecasts were estimated for 2020 and 2030 using City-specific demographic and vehicle activity projections through 2030 from the SANDAG Series 13 Regional Growth Forecast. At the time of writing this CAP, the SANDAG Series 13 Regional Growth Forecast represents the best available regional population, employment, and VMT forecasts. This data is based primarily on U.S. Census data, which is collected every ten years. The U.S. Census Bureau will begin collecting census data in mid-2020. This census data, providing the most up-to-date population information for the

City will be released for public use in early- to mid-2021. In general, the City is anticipated to experience modest growth by 2020 and 2030, as reflected in the emissions forecasts. Based on the regional growth forecast, the City's population is expected to increase by five percent by 2020 and 11 percent by 2030 from 2012 levels. Total jobs in the City are expected to increase by eight percent by 2020 and 14 percent by 2030 from 2012 levels. Further details on the underlying SANDAG data used for emissions forecasts can be found in **Appendix A**.

From 2012 levels, population in the City is expected to increase by:
- **5% by 2020, and**
- **11% by 2030.**

2.3.2 Business-As-Usual Projections

The BAU projections assume that no additional efforts beyond those already being implemented within the City will be made to reduce GHG emissions in the future. The City's annual emissions are projected to decrease from 2012 through 2020. This decrease in BAU emissions is reflective of actions taken by State and federal agencies and improved efficiency of new buildings and automobiles. Based on these projections, the City's GHG emissions would continue to decrease into the future through 2030.

Legislative Reductions

The Legislatively-Adjusted BAU scenario accounts for a variety of approved legislative actions that will further reduce BAU emissions in the City. This adjustment accounts for the implementation of legislative actions at the federal and State levels by estimating the impacts of these actions on the various GHG emissions-producing categories in the CAP. The Legislatively-Adjusted BAU does not include local-government actions, such as the implementation of GHG emissions reduction measures identified in this CAP. The legislative actions applied to estimate the Legislatively-Adjusted BAU include:

- **Federal and State Vehicle Efficiency Standards:** Tailpipe emissions standards through 2025, including California Zero Emissions Vehicle Program.
- **California Renewables Portfolio Standards:** 43 percent renewables in 2016 increasing to 60 percent by 2030.
- **California Energy Efficiency Programs:** Utility's energy efficiency target, to be achieved though rebate programs, codes, and standards.
- **California Solar Policies and Programs:** California Solar Initiative, New Solar Homes Partnership, Net Energy Metering, building codes and standards updates.

Source: City of Lemon Grove

A detailed description and analysis of how specific legislative reductions are included in the City's Legislatively-Adjusted BAU GHG emissions inventory and projections can be found in **Appendices A** and **B**. **Table 2-3** below shows the summary of the City's projected BAU and Legislatively-Adjusted BAU GHG emissions for the years 2020 and 2030.

Table 2-2 City of Lemon Grove Emissions Forecasts ($MTCO_2e$/year)

Emissions Sector	2012	2020		2030	
		BAU	Legislatively-Adjusted BAU	BAU	Legislatively-Adjusted BAU
On-Road Transportation	70,700	63,300	61,100	62,700	48,600
Electricity	34,000	24,600	21,900	26,100	11,100
Natural Gas	16,700	15,500	15,100	16,400	14,500
Solid Waste	3,600	3,600	3,600	3,800	3,800
Off-Road Transportation	2,900	2,700	2,700	3,400	3,400
Water	1,200	1,200	1,200	1,200	1,200
Wastewater	300	300	300	300	300
Total	129,400	111,100	105,800	112,800	82,800
Percent change from 2012 (%)	-	***-14%***	***-18%***	***-13%***	***-36%***

Notes: Columns may not add to totals due to rounding.
BAU = business as usual
GHG = greenhouse gas emissions
$MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: EPIC 2019.

2.4 Reduction Targets

As directed in AB 32 and SB 32, this CAP focuses on reducing emissions consistent with these legislative actions by 2020 and 2030. The 2020 and 2030 targets set in AB 32 and SB 32, and the pathway to achieve these targets in the CARB's 2017 Scoping Plan, represent benchmarks consistent with prevailing climate science, charting an appropriate trajectory forward that is in-line with the State's role in stabilizing global warming below dangerous thresholds. These goals aim to reduce statewide emissions to:

- 1990 levels by 2020;
- 40 percent below 1990 levels by 2030; and
- 80 percent below 1990 levels by 2050.

Though framed to reduce emissions to meet the State's near-term requirements, these targets are intended to provide a pathway for reductions beyond 2030. To determine an equivalent reduction target at the local level, CARB's 2017 Scoping Plan recommends communitywide GHG reduction goals for local climate action plans that will help the State achieve its 2030 target and longer-term 2050 goal (80 percent below 1990 levels by 2050). Estimating the equivalent reduction needed from the City's 2012 baseline based on the State inventory, the following adjusted reduction targets should be achieved in the City:

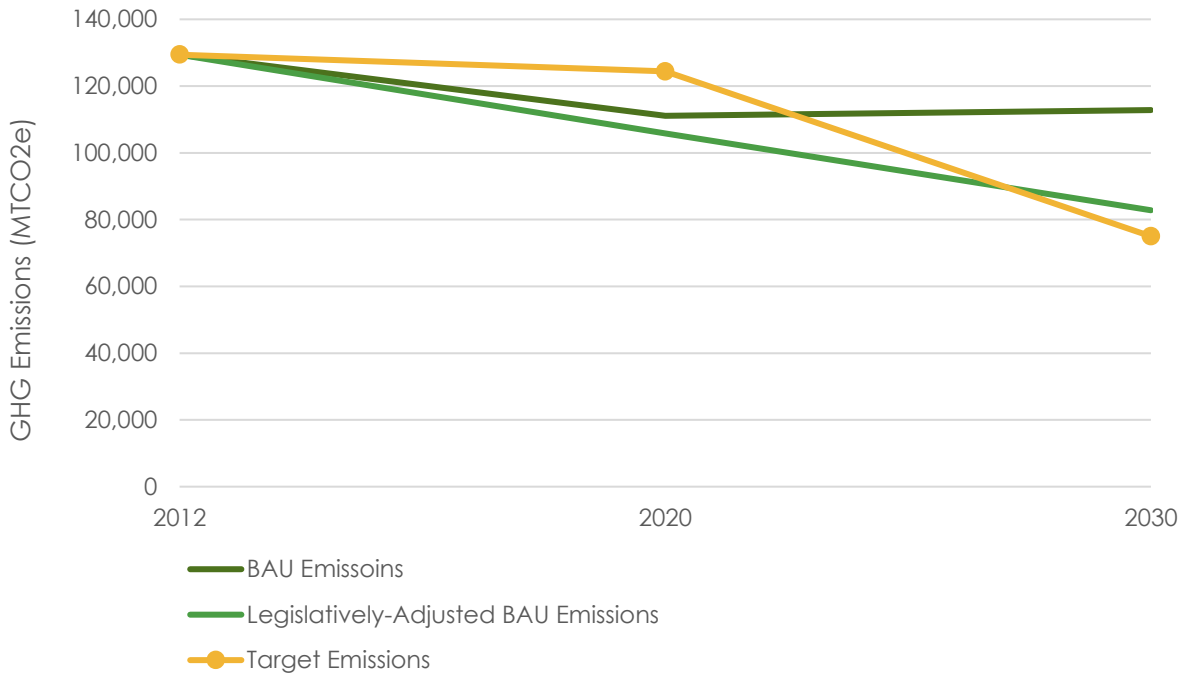
- 4 percent below 2012 levels by 2020; and
- 42 percent below 2012 levels by 2030.

The City has set its 2030 target based upon the trajectory necessary to meet the statewide 2050 goal. The City's targets would require GHG emissions to be reduced to 124,400 $MTCO_2e$ in 2020 and 75,000 $MTCO_2e$ in 2030.

The City's reduction targets for 2020 and 2030 represent the reductions necessary for the City to achieve its **fair** reduction contribution to meet Statewide targets.

2.5 Local Emissions Gap

Based on the current demographic trends, and as shown in **Figure 2-2**, the BAU projection would meet the City's 2020 target without any additional federal, State, or local actions. Under the BAU scenario, the City is projected to generate 111,110 $MTCO_2e$ annually, which would be 13,300 $MTCO_2e$ below the City's 2020 target. With State and federal adjustments applied, the City's Legislatively-Adjusted BAU emissions were estimated to be 105,800 $MTCO_2e$ in 2020, or 18,600 $MTCO_2e$ below the 2020 target.



Notes: BAU = Business-As-Usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: EPIC 2018; Ascent Environmental 2019.

Figure 2-2 City of Lemon Grove Projections and Targets Without Climate Action Plan Actions

While existing activities would be adequate to meet the City's 2020 target, these activities along with federal and State legislative actions would not be adequate to achieve the City's 2030 GHG reduction target. With legislative adjustments, the City's estimated GHG emissions in 2030 would be 82,800 $MTCO_2e$ in 2030. Legislative actions would account for a large proportion of the reductions needed to achieve this goal; however, the City would need to implement additional actions to achieve further reductions. This additional reduction needed at the local level to meet the reduction targets for each year is referred to as the "local emissions gap." To close this gap, the City would need to implement local actions that would result in an additional reduction of approximately 7,800 $MTCO_2e$ in 2030.

Source: City of Lemon Grove

The City's CAP reductions will be **ambitious** in order to meet the 2030 reduction target. The City will implement locally-oriented measures that will reduce emissions from local activities.

Because the City would achieve the 2020 emissions reduction target under BAU conditions, this CAP primarily focuses on reducing emissions in 2030 through local actions. While setting goals beyond 2030 is important to provide long-term objectives, it is difficult to establish longer-term targets for which defensible reduction assumptions can be made. This is primarily because of uncertainty around future technological advances and future changes in State and federal law beyond 2030. As climate change science and policy continues to advance, the City may be able to apply new strategies to assist in the State's long-term 2050 GHG emissions reduction goal in future CAP updates.

A detailed description of the calculations and estimates for these emissions projections and targets is provided in **Appendix B**.

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03 Greenhouse Gas Reduction Strategies, Goals, and Action

This chapter presents the strategies and measures that the City of Lemon Grove (City) will implement to achieve its greenhouse gas (GHG) reduction targets. Accounting for legislative actions taken by the federal and State governments, this CAP focuses on locally-based measures the City can implement to reduce GHG emissions in various emissions categories.

CAP strategies are organized under five GHG emissions categories:

- Transportation
- Energy (Electricity and Natural Gas)
- Water
- Solid Waste
- Urban Landscaping

The City's Climate Action Plan (CAP) includes eight strategies, organized under five emissions categories, that serve as the foundation for identifying and addressing ways in which the City will reduce citywide GHG emissions. Within each strategy are a series of measures and supporting activities that define the activities, programs, policies, and projects the City will implement to reduce GHG emissions. The 25 measures identified in this CAP focus on reductions from communitywide activities and municipal operations. Through partnerships with and among the community, businesses, and other organizations, these measures would provide co-benefits, such as an improved environment, cost savings, resource conservation, and improved quality of life.

The City has identified reduction strategies and measures that are **comprehensive and integrated** and result in emissions reductions across all emissions categories.

3.1 Summary of Greenhouse Gas Reduction Strategies

Consistent with State goals, the City has established a 2020 GHG emissions reduction target (four percent below 2012 levels) and a 2030 target (42 percent below 2012 levels) to reduce annual emissions levels. As described in **Chapter 2**, the City would successfully meet its 2020 target under the business-as-usual (BAU) scenario if citywide growth is consistent with projections. The City is anticipated to generate 111,110 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2020 under BAU conditions, which would be 13,300 $MTCO_2e$ less than the 2020 target. Under BAU conditions, the City is anticipated to generate 112,800 $MTCO_2e$ in 2030. The measures in this CAP are focused on meeting the 2030 target, which would not be met under BAU conditions. It is anticipated the City would require the reduction of an additional 37,800 $MTCO_2e$ from BAU levels to achieve the 2030 target. State and federal regulations (see Legislatively-Adjusted BAU projections in **Chapter 2**) would further reduce citywide emissions in 2030; however, the City would still be responsible for reducing approximately 7,800 $MTCO_2e$ through local actions to meet its 2030 target.

Source: City of Lemon Grove

Table 3-1, below, shows the GHG reductions attributable to the measures in this CAP and how anticipated reductions will help the City close the gap of 7,800 $MTCO_2e$ to meet its 2030 target. Detailed calculations and descriptions of the calculation methodologies are provided in **Appendix B**.

Table 3-1 Greenhouse Gas Emissions Reductions from Business-as-Usual Conditions

Emissions Projection/Category	2030 Emissions ($MTCO_2e$)
BAU Emissions Projection	**112,800**
Federal and State Action Reductions	29,970
Legislatively-Adjusted BAU Emissions Projection (BAU Projection – Federal and State Action Reductions)	**82,830**
2030 Target Emissions	**75,000**
Reductions from CAP Transportation Measures	4,000
Reductions from CAP Energy Measures	2,730
Reductions from CAP Water Measures	10
Reductions from CAP Waste Measures	2,810
Reductions from CAP Carbon Sequestration Measures	40
Total Reductions from CAP Measures	**9,630**
City of Lemon Grove Emissions with CAP (Legislatively-Adjusted BAU – CAP Reductions)	**73,200**

Notes: Numbers are rounded to the nearest thousand (with the exception of reduction measure values which were rounded to the nearest hundred); values and totals may not equal the values summed in other tables or figures.
BAU = business-as-usual; CAP = Climate Action Plan; $MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: EPIC 2019.

3.2 Reduction Strategies and Measures

To close the gap between the City's anticipated Legislatively-Adjusted BAU emissions and the CAP target in 2030, this CAP proposes eight strategies and 25 GHG reduction measures organized under five GHG emissions categories. These strategies and measures were developed based on a combination of factors, including:

- the feasibility of the measure to be implemented by the City;
- existing policies, actions, or programs that can be expanded or proposed policies yet to be adopted;
- feedback from community and other stakeholders; and
- technological innovations.

The CAP includes **relevant** reduction measures based on the best-available existing technologies that would reduce GHG emissions at a local level.

Each strategy, measure, and associated GHG emissions reductions are described below. Additional GHG reduction calculation details are included in **Appendix B**. The strategy framework consists of strategies, measures, target year, goals, and GHG reduction potential which are defined in **Table 3-2**. Implementation efforts for GHG reduction measures are described in **Chapter 5**.

Table 3-2 Greenhouse Gas Reduction Strategy Framework

Notation	Description
Strategy	High-level plans the City will implement to achieve GHG reductions in one of the five emissions categories. Each emissions category may have one or more associated strategies. The framework includes eight overall strategies.
Measure	Programs, policies, or projects the City will implement that will cause a direct and measurable reduction in GHG emissions.
Goal	Metric by which achievement of the specified measure will be determined in 2030.
GHG Reduction Potential in 2030	Estimated reduction in local GHG emissions if the goal is met. The year 2030 corresponds to the emissions target year set by the City (and in line with State mandates). Because the City would achieve its 2020 target under BAU conditions, the GHG reduction potential is presented for the year 2030.
Supporting Activities	Additional activities that are currently occurring or will occur within the community that may support implementation of identified measures and/or result in additional GHG reductions, but were not quantified within this CAP.

Notes: BAU = business-as-usual; CAP = Climate Action Plan; City = City of Lemon Grove; GHG = greenhouse gas
Source: Ascent Environmental 2019.

3.2.1 Transportation

Internal combustion from on-road transportation is the largest contributor to the City's GHG emissions. Emissions from on-road transportation sources accounted for 55 percent of the City's total emissions in 2012. Off-road transportation sources are also included in this emissions category, which accounts for usage of construction equipment, residential and commercial equipment, and recreational vehicles. Legislative reductions from improvements in federal and State vehicle fuel efficiency standards will contribute to reducing transportation emissions. At the local level, the State relies on local or regional agencies to implement strategies that would reduce the frequency or distance of vehicle travel or reduce the use of internal combustion vehicles by shifting to alternative modes of transportation. These strategies include increasing zero-emission or alternative fuel vehicle use, increasing transportation system efficiency for existing and future travel patterns, and increasing the use of alternative travel modes including bicycling, walking, and transit.

Source: City of Lemon Grove

Strategy 1: Increase Use of Zero-Emission or Alternative Fuel Vehicles

Strategy 1 Co-Benefits:

- Improved Air Quality
- Improved Public Health

The focus of this strategy is to reduce the use of gasoline or diesel-powered vehicles and equipment and increase the use of zero-emission or alternative fuel vehicles citywide. This reduction is achieved by increasing the purchase and use of zero-emission and alternative fuel vehicles. Reductions from this strategy would occur through municipal actions and partnerships with local businesses, developers, and agencies. This strategy includes four measures that would reduce the City's emissions by approximately 460 $MTCO_2e$ in 2030. **Table 3-3** outlines the framework for this strategy.

Table 3-3 Strategy 1: Increase Use of Zero-Emission/Alternative Fuel Vehicles

Measure T-1: Transition to a Clean and More Fuel-Efficient Municipal Vehicle Fleet.

Replace light-duty municipal vehicles with EVs or other types of ZEVs and replace diesel vehicles with AFVs.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Reduce municipal fleet gasoline use to 5,915 gallons in 2030.	17
Reduce municipal fleet diesel use to 1,845 gallons in 2030.	

Measure T-2: Install Electric Vehicle Charging Stations at Municipal Facilities.

Install publicly available EV charging stations at municipal facilities for use by City staff, contractors, or others conducting City-related business.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Install six Level 2 or better EV charging stations at municipal facilities by 2030.	71

Measure T-3: Increase the Number of Electric Vehicle Charging Stations at New and Existing Private Developments.

Adopt a zoning ordinance requiring the installation of EV charging stations for:

- Five percent of total parking spaces provided at new multi-family and commercial developments.
- Five percent of total parking spaces provided at multi-family and commercial renovations or additions, with a permit value of $100,000 or greater.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Adopt a zoning ordinance by 2022.	196
Install a total of 51 Level 2 or better EV charging stations at multi-family and commercial developments by 2030.	

Measure T-4: Transition to an Electric School Bus Fleet.

Support the GUHSD and LGSD in their efforts to convert the school bus fleet to electric buses.

Table 3-3 Strategy 1: Increase Use of Zero-Emission/Alternative Fuel Vehicles	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Reduce diesel consumption in GUHSD and LGSD school buses to 17,003 gallons in 2030.	173

Supporting Activities for Strategy 1:

- Identify Sage Projects that would increase the use of zero-emission or alternative fuel vehicles and could be implemented by the City.

Notes: AFV = Alternative Fuel Vehicle; City = City of Lemon Grove; EV = Electric Vehicle; GHG = greenhouse gas; GUHSD = Grossmont Union High School District; LGSD = Lemon Grove School District; $MTCO_2e$ = metric tons of carbon dioxide equivalent; ZEV = Zero-Emissions Vehicle
Source: EPIC 2019.

Strategy 2: Reduce Fossil Fuel Use

Strategy 2 Co-Benefits:

- Improved Air Quality
- Reduced Energy Use
- Improved Public Health
- Reduced Traffic Congestion
- Enhanced Safety
- Enhanced Community Character

Vehicle efficiency standards and the use of alternative fuels are promoted through this strategy in support of federal and State mandates. Under this strategy, on-road transportation fuel consumption would be reduced by improving traffic flow and increasing the efficiency of the existing traffic network. Off-road vehicle and equipment fossil fuel consumption would be reduced using alternatively fueled equipment. Emissions reductions in this strategy would be achieved through interagency participation to implement projects in the City's right-of-way, and working with developers and fleet owners to phase out old, fossil fuel-reliant equipment. This strategy includes two measures that would reduce the City's emissions by approximately 660 $MTCO_2e$ by 2030. **Table 3-4** outlines the framework for this strategy.

Table 3-4 Strategy 2: Reduce Fossil Fuel Use	
Measure T-5: Synchronize Traffic Signals.	
Synchronize traffic signals at major corridors citywide and participate in the Regional Arterial Management System.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Synchronize 20 traffic signals by 2030.	248
Measure T-6: Increase Renewable and Alternative Fuel Use in Construction Equipment.	
Require new development projects to increase the use of electric-powered or alternatively fueled construction equipment.	

Table 3-4 Strategy 2: Reduce Fossil Fuel Use	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Require at least 30 percent of construction equipment in new developments to be electric-powered or alternatively fueled.	416

Supporting Activities for Strategy 2

- Identify Sage Projects that would reduce fossil fuel use and could be implemented by the City
- Continue to work with the LGSD to improve safety and efficiency of drop-off/pick-up operations at schools to reduce vehicle idling time.

Notes: City = City of Lemon Grove; GHG = greenhouse gas; LGSD = Lemon Grove School District; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: EPIC 2019.

Strategy 3: Reduce Vehicle Miles Traveled

To reduce vehicle miles traveled (VMT), this strategy focuses on increasing alternative modes of travel, reducing single-occupancy vehicle travel, and encouraging smart growth design. All measures to reduce VMT rely on participation from regional and municipal agencies, residents, and local businesses. Implementation of the seven measures identified in this strategy would reduce the City's GHG emissions by approximately 2,840 by 2030. **Table 3-5** outlines the framework for this strategy.

Strategy 3 Co-Benefits:

- Improved Air Quality
- Reduced Energy Use
- Improved Public Health
- Reduced Traffic Congestion
- Improved Access to Low-Cost Transportation Options
- Enhanced Safety
- Enhanced Community Character

Table 3-5 Strategy 3: Reduce Vehicle Miles Traveled	
Measure T-7: Participate in the San Diego Association of Government's iCommute Vanpool Program.	
Maintain the existing number of vanpools participating in SANDAG's iCommute Vanpool Program that start or end in the City, and promote participation of City residents and businesses.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Maintain at least eight vanpools that start or end in the City through 2030.	88
Measure T-8: Develop a Citywide Transportation Demand Management Plan.	
Adopt a TDM ordinance requiring new commercial developments to increase the use of alternative modes of transportation and work with existing employment center[1] businesses to develop TDM policies.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Increase the alternative mode share for new developments and businesses in the employment centers to eight percent through 2030.	581

Table 3-5 Strategy 3: Reduce Vehicle Miles Traveled	
Measure T-9: Implement the Safe Routes to School Program.	
Continue to support the LGSD's efforts to implement a Safe Routes to School program to increase the number of students walking and riding bicycles to and from schools.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Increase the percentage of students walking to school to 30 percent by 2030.	18
Increase the percentage of students bicycling to school to 2.5 percent by 2030.	
Measure T-10: Increase Commute by Bicycle.	
Increase the number of commuters using bicycles by completing the *Connect Main Street* project, which includes the development of two miles of a new Class I bicycle path along Lemon Grove Avenue.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Complete full buildout of the *Connect Main Street* project by 2030.	89
Measure T-11: Reduce Residential Parking Requirements Near Trolley Stations.	
Reduce the number of required parking spaces by at least 50 percent in new multi-family residential developments within the DVSP Transit Mixed Use Zones and near the Massachusetts Avenue trolley station.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Develop at least 763 multi-family units near trolley stations with 50 percent or fewer parking spaces than standard requirements.	718
Measure T-12: Transition to an Online Building Permits Submittal System.	
Reduce the number of vehicle trips to municipal facilities by providing online permit submittal and processing for all types of building permits.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Completely transition to an online permitting submittal system by 2030.	3
Measure T-13: Increase Commute by Transit.	
Increase the number of commuters to college and work that use transit to travel to and from Lemon Grove.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Increase the total percentage of transit commuters in the City to eight percent by 2030.	1,343

Table 3-5 Strategy 3: Reduce Vehicle Miles Traveled

Supporting Activities for Strategy 3:

- Identify Sage Projects that would reduce vehicle miles traveled and could be implemented by the City
- Work with SANDAG to continue its bicycle safety education activities including Bike Month, bicycle rodeos, and walk-and-roll programs.
- Work with community organizations and local bicycle advocacy groups to provide education outreach to school-aged populations.
- Explore micro-mobility for first mile/last mile needs.
- Participate in future SANDAG-led mobility hub planning programs.
- Coordinate with regional transit authorities and local school districts to improve public transit.

Notes: City = City of Lemon Grove; DVSP = Downtown Village Specific Plan; GHG = greenhouse gas; LGSD = Lemon Grove School District; $MTCO_2e$ = metric tons of carbon dioxide equivalent; SANDAG = San Diego Association of Governments; TDM = Transportation Demand Management

[1] Lemon Grove Employment Center defined by SANDAG in support of the 2021 Regional Plan. The Lemon Grove Employment Center is defined as a Tier 4 employment center.

Source: EPIC 2019.

3.2.2 Energy

Energy consumption in the City includes electricity and natural gas consumption, which accounted for 44 percent of the City's total emissions in 2012. Emissions reductions from the energy category are divided into two strategies to increase building energy efficiency and increase the use of renewable energy sources. The success of these strategies relies on coordination with local utilities and organizations, participation from the community, and administration of new or revised local policies and programs.

Source: City of Lemon Grove

Strategy 4: Increase Building Energy Efficiency

Strategy 4 Co-Benefits:

- Improved Air Quality
- Reduced Energy Use
- Improved Public Health
- Enhanced Safety
- Reduced Heat Island Effect
- Enhanced Community Character
- Increased Local Green Jobs
- Improved Resiliency to Climate Change Impacts

Electricity and natural gas consumption in residential and non-residential buildings accounts for the majority of GHG emissions from the energy sector. Although legislative reductions related to State actions will help reduce emissions associated with building energy, additional reductions are achievable by increasing building efficiency in the City. This strategy aims to reduce emissions by reducing energy used by residential and non-residential consumers through increased energy efficiency in buildings and facilities. This strategy includes three measures, each aimed at a separate energy consumer or land use type within the City (i.e., residential, commercial, and civic). Implementation of this strategy would reduce the City's emissions by approximately 230 $MTCO_2e$ by 2030. **Table 3-6** outlines the framework for this strategy.

Table 3-6 Strategy 4: Increase Building Energy Efficiency

Measure E-1: Increase Street Lighting Efficiency Citywide.	
Reduce electricity use from City-owned streetlights by converting existing HPS lights to LED lights.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Reduce streetlight energy use by 40% by 2030.	27
Measure E-2: Reduce Non-Residential Energy Use.	
Adopt an Energy Efficiency Ordinance that requires renovations or additions to existing non-residential developments with a permit value of $25,000 or greater to implement energy retrofit measures. Energy retrofits must demonstrate the development would result in a 15 percent decrease in energy consumption.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Adopt an Energy Efficiency Ordinance by 2022.	173
Approve at least 225,000 sq. ft. of major non-residential renovations or additions that implement energy retrofit measures by 2030.	
Measure E-3: Reduce Residential Energy Use.	
Adopt an Energy Efficiency Ordinance that requires renovations or additions to existing residential developments with a permit value of $25,000 or greater to implement energy retrofit measures.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Adopt an Energy Efficiency Ordinance by 2022.	26
Approve at least 162 major residential renovations or additions that implement energy retrofit measures by 2030.	

Table 3-6 Strategy 4: Increase Building Energy Efficiency
Supporting Activities for Strategy 4: ▪ Identify Sage Projects that would increase building energy efficiency and could be implemented by the City. ▪ Work with SDG&E to identify local businesses with high hot water heating load that could benefit from installation of solar water systems. ▪ Implement building retrofit programs. ▪ Facilitate homeowner and business owner financing of energy efficiency measures through PACE financing options.

Notes: City = City of Lemon Grove; GHG = greenhouse gas; HPS = high pressure sodium; LED = light emitting diode; $MTCO_2e$ = metric tons of carbon dioxide equivalent; PACE = Property Assessed Clean Energy; SDG&E = San Diego Gas & Electric; sq. ft. = square feet

Source: EPIC 2019.

Strategy 5: Increase Renewable and Zero Carbon Energy

Transitioning from fossil fuels to renewable energy for electricity generation will reduce emissions and provide a more sustainable source of electricity. Under this strategy, emissions are reduced by incorporating cleaner, renewable energy for residential, commercial, and municipal operations within the City, and by adopting a community choice aggregation (CCA) or similar program to increase the amount of grid supplied renewable energy. Implementation of the four measures would reduce the City's emission by approximately 2,510 $MTCO_2e$ by 2030. **Table 3-7** outlines the framework for this strategy.

Strategy 5 Co-Benefits:

- Improved Air Quality
- Reduced Energy Use
- Improved Public Health
- Enhanced Community Character
- Increased Local Green Jobs
- Improved Resiliency to Climate Impacts

Table 3-7 Strategy 5: Increase Renewable and Zero-Carbon Energy

Measure E-4: Increase Renewable Energy Generation at Non-Residential and Multi-Family Developments.

Adopt an ordinance requiring the installation of PV at new non-residential developments and major multi-family and commercial renovations and additions (permit value of $100,000 or more).

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Install at least 0.08 MW of PV at new non-residential developments by 2030.	72
Install at least 0.15 MW of PV at existing non-residential buildings by 2030.	

Measure E-5: Achieve Zero Net Energy Municipal Operations.

Achieve zero net energy municipal operations through the installation of PV systems or other renewable energy generation systems at municipal facilities.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Install PV systems that would generate at a minimum 1,172 MWh/year in 2030, or equivalent generation through other renewable systems.	212

Measure E-6: Require New Residential Uses to be All-Electric and Generate Renewable Energy On-Site.

Adopt an ordinance requiring all new residential developments to be all-electric and install PV systems.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Develop at least 17 all-electric single-family residential homes with 1.1 kW PV systems by 2030.	287
Develop at least 333 all-electric multi-family units with 1.1 kW/unit PV systems by 2030.	

Measure E-7: Increase Grid-Supply Renewable and Zero-Carbon Electricity.

Participate in a CCA or similar program to increase grid-supply renewable and zero-carbon electricity supply to 75 percent by 2030.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Achieve 75 percent renewable and zero-carbon electricity supply by 2030.	1,938

Supporting Activities for Strategy 5

- Identify Sage Projects that would increase renewable and zero-carbon energy and could be implemented by the City
- Support the implementation of SANDAG's Roadmap Program.

Notes: CCA = Community Choice Aggregation; City = City of Lemon Grove; GHG = greenhouse gas; kW = kilowatt; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MW = megawatt; MWh = megawatt-hour; PV = photovoltaic; SANDAG = San Diego Association of Governments
Source: EPIC 2019.

3.2.3 Water

GHG emissions are produced through the energy consumed to pump, transport, and treat water and wastewater. Though the water sector only accounts for 1 percent of the City's total emissions in 2012, reduction measures aimed at water consumption also play a role in adapting to climate change impacts. By reducing water consumption through water efficiency initiatives and recycling wastewater, the City can reduce water demand as climate change impacts reduce water supply. Beyond achieving emissions reductions, this strategy provides the City with sustainable practices that will allow it to better adapt to climate change.

Source: City of Lemon Grove

Strategy 6: Increase Water Efficiency

Water consumption reductions under this strategy would result from more efficient water use strategies in both residential and non-residential uses. The measures identified in this strategy would provide residents, businesses, and municipal operators effective ways to reduce water consumption. This strategy achieves emissions reductions by reducing the energy needed to supply, treat, and deliver water. The implementation of the two measures under this strategy would reduce the City's GHG emissions by approximately 10 $MTCO_2e$ by 2030. **Table 3-8** outlines the framework for this strategy.

Strategy 6 Co-Benefits:

- Reduced Energy Use
- Improved Water Quality
- Enhanced Community Character
- Increased Local Green Jobs
- Improved Resiliency to Climate Impacts

Table 3-8 Strategy 6: Increase Water Efficiency

Measure W-1: Increase Outdoor Water Efficiency.	
Require landscaped areas at new residential and non-residential projects to meet the City's WELO requirements by planting low water use plants and installing high efficiency irrigation systems.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Develop at least 20,000 sq. ft. per year of new, WELO-compliant landscaped area through 2030.	3

Table 3-8 Strategy 6: Increase Water Efficiency	
Measure W-2: Reduce Water Use at City Parks and Municipal Facilities.	
Reduce water consumption in municipal facilities and landscape irrigation water use in City parks.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Reduce municipal water use in facilities and parks by 50 percent by 2030.	8

Supporting Activities for Strategy 6

- Identify Sage Projects that would increase water efficiency and could be implemented by the City.
- Identify methods to streamline graywater permit review.
- Create, maintain, and advertise graywater education programs.
- Encourage stormwater capture and reuse.
- Partner with Helix Water District to share information with residents and local businesses for water audit programs and incentives for water efficient landscaping.
- Promote Department of Water Resources Rebate Programs for turf installation, xeriscaping, and other water efficiency projects.

Notes City = City of Lemon Grove; $MTCO_2e$ = metric tons of carbon dioxide equivalent; sq. ft. = square feet; WELO = Water Efficient Landscape Ordinance
Source: EPIC 2019.

3.2.4 Solid Waste

GHG emissions from waste are generated through its disposal and off-gassing at landfills. Though this category represents only two percent of the City's total emissions in 2012, significant reductions could be made through changing individual behavior through partnerships with local waste haulers and outreach to residents and businesses.

Source: City of Lemon Grove

Strategy 7: Reduce and Recycle Solid Waste

Under this strategy, the City would reduce the amount of solid waste deposited at landfills by diverting it to other waste streams, such as recycling or composting. This diversion would also provide recycled solid waste materials for reuse in other products. The implementation of the one measure under this strategy would reduce the City's GHG emissions by approximately 2,800 $MTCO_2e$ by 2030. **Table 3-9** outlines the framework for this strategy.

Strategy 7 Co-Benefits:

- Reduced Energy Use
- Improved Air Quality
- Enhanced Community Character
- Increased Local Green Jobs
- Improved Resiliency to Climate Impacts

Table 3-9 Strategy 7: Reduce and Recycle Solid Waste	
Measure S-1: Increase Citywide Waste Diversion.	
Work with the City's franchise waste hauler to achieve a citywide waste diversion rate of 80 percent by 2030.	
Goal	**GHG Reduction Potential in 2030 ($MTCO_2e$)**
Achieve 80 percent citywide waste diversion by 2030.	2,811

Supporting Activities for Strategy 7

- Identify Sage Projects focused on reducing and recycling solid waste and could be implemented by the City.
- Explore opportunities with franchise waste haulers and other local businesses to develop and encourage participation in commercial food scrap collection programs.
- Develop an outreach campaign for communitywide materials management service offerings and behavior changes focused on lifecycle of materials.
- Work with franchise waste haulers to add residential food scrap collection services to the City's waste collection contract.
- Collaborate with franchise waste hauler to promote an anaerobic digestion facility planned to open in 2021.

Notes: City = City of Lemon Grove; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent
Source: EPIC 2019.

3.2.5 Carbon Sequestration

The process of removing atmospheric CO_2 through artificial or natural processes is referred to as carbon sequestration. This process occurs daily through the natural respiration of vegetation and trees. As part of the natural carbon cycle, photosynthesis in plants takes CO_2 in the atmosphere and converts it into oxygen and carbon-based plant matter, storing the carbon captured from the atmosphere. Communities can enhance or improve their carbon sequestration potential by increasing the volume and rate of planting trees and creating an urban tree canopy. Conversely, carbon sequestration potential is lost when carbon sinks (i.e. trees) are cut down or neglected.

Source: City of Lemon Grove

Strategy 8: Carbon Sequestration

Strategy 8 Co-Benefits:

- Improved Air Quality
- Increased Natural Habitat
- Improved Public Health
- Improved Water Quality
- Reduced Heat Island Effect
- Enhanced Community Character
- Increased Local Green Jobs
- Improved Resiliency to Climate Impacts

The presence of trees is a significant source of carbon sequestration and storage because of their natural process of converting CO_2 into oxygen and carbon-based plant matter through photosynthesis. In addition, tree sizes and longevity provide simple solutions for carbon storage. This strategy focuses on increasing the number of new trees planted in public areas and at new developments to increase the amount of carbon sequestered. In addition to offsetting CO_2 emissions generated by other sources, increased tree plantings result in co-benefits including improved air quality through the capture of air pollutants and community and public health benefits through the provision of shade and positive impacts on mental health. Implementation of the two measures through this strategy would reduce the City's emissions by approximately 40 $MTCO_2e$ by 2030. **Table 3-10** outlines the framework for this strategy.

Table 3-10 Strategy 8: Carbon Sequestration

Measure C-1: Develop a Citywide Urban Tree Planting Program.

Develop and implement an Urban Tree Planting Program to increase the number of new trees planted at City-owned landscaped areas and rights-of-way.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Plant at least 50 new trees per year in City-owned landscaped areas through 2030.	24

Measure C-2: Increase Tree Planting at New Developments.

Enforce the City's Landscape and Irrigation Regulations for new developments that include: a minimum of one tree for every six off-street parking spaces; and a minimum of one tree per 1,000 sq. ft. of landscaped area.

Goal	GHG Reduction Potential in 2030 ($MTCO_2e$)
Plant at least 22 new trees per year at new developments through 2030.	12

Supporting Activities for Strategy 8

- Identify Sage Projects that would increase carbon sequestration citywide and could be implemented by the City.

Notes: City = City of Lemon Grove; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; sq. ft. = square feet

Source: EPIC 2019.

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04 Climate Adaptation

This chapter summarizes climate change-related impacts that may affect the City of Lemon Grove (City) in the future; evaluates how these impacts would potentially affect the community's population, functions, and structures; and outlines key strategies for improving community resiliency and adaptation, while accounting for the City's current adaptation efforts.

4.1 Introduction

The California Adaptation Planning Guide (APG), developed by the California Office of Emergency Services (CalOES) and California Natural Resources Agency, helps communities throughout California plan for and adapt to the impacts of climate change (CalOES 2019). The APG includes a four-phase process, illustrated in **Figure 4-1**, which allows communities to assess their specific climate vulnerabilities and provides a menu of strategies for communities to reduce climate-related risks and prepare for current and future impacts of climate change.

Source: APG 2019; Ascent Environmental 2019.

Figure 4-1 The Four Phases in the Adaptation Planning Process

Preparing for the future impacts of climate change is a complex challenge. Climate science is evolving, and it is complicated by the uncertainty of global emissions levels expected in the mid- to late-21st century. As science evolves, so will the City's adaptation strategy. The policies, plans, and actions put in place to enhance adaptation and resilience to the effects of climate change must be grounded in the best available science of the time, and thoughtfully reevaluated as new information or technologies become available. To be most effective, climate change adaptation requires project- and program-specific decisions that require a broad understanding of the effects of climate change.

The California Adaptation Planning Guide was developed through a **transparent and verifiable** process and has been published as a publicly available guidance document.

Phase 1, "Explore, Define, and Initiate," includes identifying the potential climate change effects and important physical, social, and natural assets in the community. This phase also identifies the key stakeholders in the local government and throughout the community. Phase 2, "Assess Vulnerability," includes an analysis of potential impacts and adaptive capacity to determine the vulnerability for populations, natural resources, and community assets. The vulnerability assessment identifies how climate change could affect the community. Phase 3, "Define Adaptation Framework and Strategies," focuses on creating an adaptation framework and developing adaptation strategies based on the results of the vulnerability assessment. Adaptation strategies identify how the community will address the potential for harm based on the community's resources, goals, values, needs, and regional context. In Phase 4, "Implement, Monitor, Evaluate, and Adjust," the adaptation framework is implemented, consistently monitored and evaluated, and adjusted based on continual learning, feedback, or triggers.

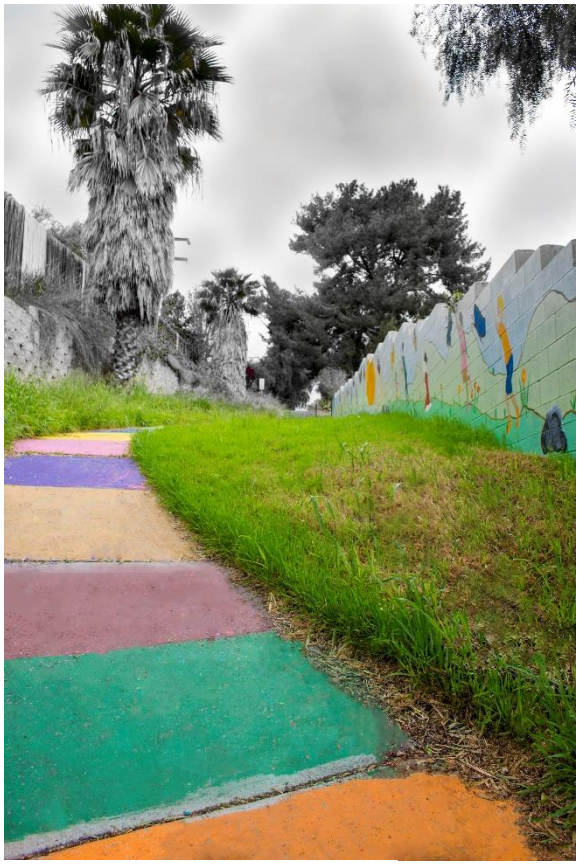
4.2 Climate Change Effects

This Climate Action Plan (CAP) summarizes the City's climate change impact vulnerabilities. This section identifies localized climate change exposure and related effects, and the consideration of how likely and how quickly impacts would occur.

4.2.1 Climate Change Effects

Idenfitying the climate change effects the City would experience through the latter half of this century (2050-2099) serves as the first step in the climate adapation planning process. Climate change effects discussed in this chapter were identified using the Cal-Adapt tool, a climate change scenario-planning tool developed by the California Energy Commissions and the University of California, Berkeley Geospacial Innovation Facility. To address the uncertainty in future emissions of greenhouse gases (GHGs), Cal-Adapt uses Representative Concentration Pathways (RCPs), which project emissions and effects over time through two emissions scenarios:

- The **Medium** (RCP 4.5) emissions scenario models a future where communities attempt to reduce GHG emissions. This scenario predicts that GHG emissions will continue to rise until leveling-off, or plateauing, in the middle of the twenty-first century. GHG emissions would decrease to below 1990 levels by the end of the 21st century.
- The **High** (RCP 8.5) emissions scenario models business-as-usual (BAU) growth where GHG emissions will continue to increase through the end of the 21st century.



Source: City of Lemon Grove

The direct, or primary, changes identified for the City through this process are average temperatures and annual precipitation amounts. Secondary impacts, which can occur because of individual changes or a combination of these changes, are also addressed in this chapter and include effects on heat wave frequency, intense storms, landslides, droughts, wildfire, and reduced snowpack (CNRA 2012). The effects of each primary and secondary impact are discussed below.

The adaptation strategies and measures included identify actions the City can take to ensure **fair** solutions that equitably address climate change risks across diverse populations in the community.

Increased Temperatures

Annual temperatures in the San Diego region and the City in particular are projected to climb steadily. The City's annual average temperature is expected to rise from historical averages under both emissions scenarios. This projected change is shown on **Table 4-1**.

Table 4-1 City of Lemon Grove Changes in Annual Average Temperatures

Scenario	Annual Temperature		
	Minimum (°F)	Average (°F)	Maximum (°F)
Historical Average (1960-1990)	71.3	73.5	76.0
Medium Emissions Scenario (2050-2099)	75.2	78.3	82.0
High Emissions Scenario (2050-2099)	77.3	81.2	85.4

Notes: °F = degrees Fahrenheit
Source: CEC 2019

The City's annual average temperature, based on data from 1960-1990, is 73.5 degrees Fahrenheit (°F). By the end of the century, it is estimated that the average temperature in the City would increase by 4.8 °F under the medium emissions scenario and 7.7 °F under the high emissions scenario. Under both scenarios, the City's annual average minimum and maximum temperatures would increase between 4.0 and 9.0 °F by the end of the century.

Urbanized areas can experience higher temperatures, greater pollution, and negative health effects, especially during summer months, when compared to communities that are more rural. This phenomenon is known as the Urban Heat Island Effect (UHIE). Urban heat islands are created by a combination of heat-absorptive surfaces (e.g., dark pavement and roofing), heat-generating activities (e.g., automobile engines and industrial generators), and the absence of "green spaces" (which provide evaporative cooling). During periods of high temperatures, asphalt and darker surfaces reduce nighttime cooling (as retained heat is released from these surfaces). The UHIE can affect the City in multiple ways, including: increased energy demand for cooling; decreased ambient air quality; and increased heat-related public health risks (e.g., heat stroke, dehydration, and exposure to degraded air quality) (CalEPA 2019).

Increased Frequency of Extreme Heat Events

Extreme heat events include extreme heat days and heat waves. Extreme heat days and heat waves are a secondary impact of increasing temperatures in the San Diego region. Extreme heat days occur when the daily maximum/minimum temperature exceeds the 98th historical percentile of the daily maximum/minimum temperatures. Heat waves are characterized as periods of sustained, extreme heat over multiple days (i.e. four or more consecutive extreme heat days).

The extreme heat day threshold for the City is 93.6 °F or higher. Historically (between 1960 and 1990), the City experienced an average of four extreme heat days annually, occurring primarily between April 1 through October 31. As a result of rising average temperatures and climate change, the City is projected to experience 13 to 27 extreme heat annually from 2050 to 2099 under medium and high emissions projections (CEC 2019).

Higher temperatures are linked to increased respiratory problems as higher temperatures contribute to the build-up of harmful air pollutants.

Source: Center for Disease Control, 2014.

Cal-Adapt defines extreme heat waves for the City as four or more consecutive extreme heat days. These events have historically been infrequent in the City, as the historical annual average is less than one heat wave per year, and a maximum of two heat waves occurring in a single year between 1960 and 1990. As climate change effects continue, the City is expected to experience an increase in heat wave frequency. Under the medium emissions projection, the City would experience an average of one heat wave per year, and a maximum of four heat waves occurring in a single year between 2050 and 2099. Under the high emissions projection, the City would experience an average of three heat waves per year, and a maximum of 11 heat waves occurring in a single year between 2050 and 2099 (CEC 2019).

Source: City of Lemon Grove

In addition to increasing frequency of extreme heat days and heat waves, these climate change effects are projected to occur both earlier and later in the season. In the historic record, extreme heat days and heat waves have generally occurred from late-June and mid-October. Under both the medium and high emissions projections, these events are predicted to extend from early-April through the end of October (CEC 2019).

Heat waves and extreme heat days, intensified by the UHIE, would produce a number of public health risks, particularly for vulnerable populations including small children and the elderly. Additional groups would have higher risks for heat related illnesses including people with chronic diseases, low-income populations, and outdoor workers. Risks associated with extreme heat range from sunburns and heat rash to heat exhaustion and heat stroke, which can lead to increased hospital visits and emergency services (CDC 2014).

Changes to Water Availability

The unusually wet years of 2005, 2011, and 2017 and the droughts of 2001-2004, 2007-2010, and 2012-2015 exemplify the highly variable climate of the San Diego region. Southern California has the highest year-to-year variability of any place in the continental U.S. As noted in *California's Fourth Climate Change Assessment - San Diego Region Report,* climate models indicate that precipitation volatility will intensify in the future as the global climate continues to warm. While days with measurable precipitation become less frequent in Southern California, extreme precipitation events will intensify (Kalansky and Cayan et al. 2018).

Source: City of Lemon Grove

A secondary effect from changes in precipitation patterns in the State is water availability. Changes in weather patterns resulting from increases in global average temperatures could result in a decreased proportion of precipitation falling as snow in California, and an overall reduction in snowpack in the Sierra Nevada. Increases in temperature are already causing decreases in snowpack (DWR 2019a), from which as much as a third of California's water supply is provided. Warmer temperatures have resulted in snowpack melting faster and earlier, resulting in issues storing water for use throughout the dry season. Based on historical data and modeling, California Department of Water Resources projects that by the end of this century, California's Sierra Nevada snowpack will experience a 48-65 percent loss from the historical April 1 average, which would have a direct impact on water supply for Californians (DWR 2019b).

Source: City of Lemon Grove

The Colorado Basin, being even more arid than Sierra Nevada catchments, has a smaller portion of precipitation that results in runoff, so increased evaporation demand leaves proportionately less runoff. As a result, climate warming is projected to take a high toll on Colorado River streamflow, with estimated reductions in flow from the Upper Colorado Basin at Lees Ferry ranging from 10-45 percent by mid-twenty first century (Kalansky and Cayan et al. 2018). This projected decrease in flow into the Colorado River will also have a direct impact on one of the main sources of imported water for the Metropolitan Water District of Southern California, which supplies water to the San Diego County Water Authority.

According to Cal-Adapt, California has a highly variable climate and is susceptible to dry spells. Recent research suggests that extended drought occurrence (a "mega-drought") could become

more pervasive in future decades (CEC 2019). An extended drought scenario is predicted for all of California from 2051–2070 under a climate model using the BAU-emissions scenario. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78 percent of the historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.

The projected changes in annual precipitation for the City are shown in **Table 4-2**. Under both the medium and high emissions scenarios, the City is not expected to experience significant changes in average precipitation. However, the City would experience increased variability in precipitation each year. The City's minimum annual precipitation would decrease while the maximum annual precipitation would increase under both emissions scenarios.

Table 4-2 City of Lemon Grove Changes in Annual Average Precipitation

Scenario	Annual Precipitation		
	Minimum (in)	Average (in)	Maximum (in)
Historical Average (1960-1990)	3.5	12.0	24.4
Medium Emissions Scenario (2050-2099)	2.3	11.5	31.3
High Emissions Scenario (2050-2099)	2.3	12.0	28.0

Notes: in = inches
Source: CEC 2019

While projections appear to show little change in the total annual precipitation in California, even modest changes could have dramatic effects on California's ecosystems, which are conditioned to historic precipitation levels.[1]

Increased Likelihood of Flooding

Climate models indicate that precipitation volatility will intensify in the future as the global climate continues to warm. While days with measurable precipitation become less frequent in Southern California, extreme precipitation events will intensify. Similar to other California regions, the high year-to year variability of precipitation in San Diego County is heavily affected by extreme precipitation events (days having precipitation at or exceeding the 95th percentile), which accounts for 80 percent of the year-to-year variability (Kalansky and Cayan et al. 2018). Most of the heaviest events occur during winter, although the region occasionally experiences a few high rainfall events from tropical storms or convective rainfall patterns during late summer and early fall.

Currently, the City experiences localized flooding in certain areas during heavy rainfall and extreme weather events, typically near creeks or tributaries and at intersections located at the low-points of stormwater runoff basins. In the northwestern portion of the City, localized flooding occurs along Federal Boulevard.

[1] Data for this 20-year drought scenario also included another 20-year drought scenario for the earlier part of the twenty first century (2023-2042). The model for both was derived from downscaled meteorological and hydrological simulations, and the earlier twenty first century model resulted in the same precipitation rate as the latter century scenario.

The City's flooding potential will also be exacerbated when experiencing atmospheric rivers. Atmospheric rivers, which are transports of moisture from the tropics over the Pacific Ocean in long, thin ephemeral filaments responsible for most extreme events, will carry more moisture. This trend has recently been detected in observations and is expected to increase in intensity and magnitute, resulting in increased regional and localized flooding (Kalansky and Cayan et al. 2018).

During flooding events, infrastructure (e.g., roadways, power lines) may also be damaged, in turn disrupting communications, energy transmission, public services, and transportation systems. Floodwaters during storm events can also interact with sources of pollution and distribute hazardous pollutants locally and regionally. The resulting water contamination may lead to human health impacts, as well as degradation of ecosystems and sensitive habitats.

Source: City of Lemon Grove

Increased Wildfire Risk

Drought conditions are expected to increase the likelihood of large wildfires. Wildfires in the San Diego region occur throughout the year, primarily during late summer and early fall. In the past 10 years, the extent of wildfires has exceeded that during any past decade. In 2003 and 2007, wildfires burned nearly 740,000 acres. The cost of the 2007 wildfires in San Diego was estimated at nearly $2 billion for losses in residential and commercial properties. Increased incidence of wildfires also contributes to direct injuries and mortality and indirect health effects of air pollution (CEC 2009).

Wildfires threaten more than human and property safety; wildfires release harmful air pollutants into the atmosphere which can affect respiratory health of City residents.

The City is located in a primarily urban area, but has areas designated as Very High Fire Hazard Severity along the City's western boundary (CAL FIRE 2019). This Very High Fire Hazard Severity is located within the Chollas Valley, which is within the City's sphere of influence and adjacent to employment centers within the City along Federal Boulevard.

During the dry months, the wildfire risk in Very High Fire Hazard Severity areas can increase when exacerbated by Santa Ana winds and high temperatures. In addition, extreme weather conditions, such as heat waves, low humidity, and/or winds of extraordinary force, may cause an ordinary, localized fire to expand into a more intense and difficult to control wildfire.

In addition to increased threats of human safety, the increased frequency of wildfire results in the release of harmful air pollutants that can affect the respiratory health of residents across a broad geographical region. Wildfire can also cause direct and indirect damage to electrical infrastructure. In San Diego County, downed powerlines are the second leading cause of fire damage based on area burned (Kalansky and Cayan et al. 2018). Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity.

Increased Demand on Infrastructure

Infrastructure provides the resources and services critical to City functions, including transportation (i.e. roadways, light rail lines), water (i.e. supply, storm, and sewer), electricity, gas, and communication systems. Climate change increases the likelihood of both delays and failures of infrastructure. Temporary delays or outages can result in inconvenience or economic loss, while larger failures can lead to disastrous economic and social effects. Secondary effects from climate change that impact infrastructure can include physical damages from floods or wildfires and increases in infrastructure demand, including increased stormwater capacity demand to accommodate major precipitation events and increased electricity demand to cool homes and businesses during extreme heat events.

Source: City of Lemon Grove

4.3 Adaptation Strategies

This section outlines strategies for the City to help its municipal operations and its residents adapt to the current and future impacts of climate change, while improving community resilience. These strategies can also be considered for incorporation into the next update of the City's Safety Element of the General Plan, pursuant to the requirements of Senate Bill 379, as well as in future updates to the *San Diego Multijurisdictional Hazard Mitigation Plan*. Future planning efforts by the City will use these proposed strategies to better integrate climate adaptation planning efforts into all relevant plans, policies, and programs.

Adaptation strategies are classified into five categories to address the climate change impacts identified in the vulnerability assessment. They are categorized as follows:

Strategy A-1: Prepare for Increased Temperatures and Frequency of Extreme Heat Events.

Strategy A-2: Prepare for Changes in Precipitation Patterns and Water Availability.

Strategy A-3: Prepare for Increased Flooding Risk.

Strategy A-4: Prepare for Increase Wildfire Risk.

Strategy A-5: Prepare for Increased Demand on Infrastructure.

Under each adaptation strategy, the City has identified multiple measures. The City is currently implementing adaptation efforts through existing programs and policies, and partnerships with other agencies. The following sections provide summaries of current adaptation efforts, along with the related adaptation strategy each effort supports and new adaptation measures identified by the City to support each strategy.

The adaptation strategies were identified to be **comprehensive and integrated**, addressing climate change impacts across a range of uses and populations in the City.

4.3.1 Current Adaptation Efforts

The City is currently addressing some of the challenges associated with climate change impacts through existing local policies, plans, programs, resources, and institutions. A summary of the existing climate change adaptation efforts occurring in the City is provided in **Table 4-3**.

Table 4-3 Current Adaptation Efforts in the City of Lemon Grove

Current Effort	Effort Description	Related Adaptation Strategy
Water Efficiency Measures	The City is continuing to work with the Helix Water District to implement water efficiency measures, such as eliminating runoff from irrigation and limited water use for washing paved surfaces.	2, 5
San Diego MHMP	Climate change impacts and adaptation efforts for the City have been briefly addressed in the San Diego MHMP, which provides a vulnerability assessment for all communities within San Diego County.	1-5
General Plan Update	The City is in the process of updating its General Plan. The City's General Plan update will include a Safety Element update that will identify climate change effects the City will experience and will include goals and policies to adapt and respond to these effects.	1-5
National Flood Insurance Program (NFIP)	The City is a participant in FEMA's NFIP which provides flood insurance for structures located within the floodplain areas of the City.	3
Low Income Housing Programs	The City, in partnership with the San Diego County Housing and Community Development Department, is assisting low income residents in rehabilitating homes and businesses to meet existing code requirements and improve building efficiency.	1, 2, 5
Drainage Infrastructure Analysis	The City has completed planning documents, including the Jurisdictional Runoff Management Plan completed in May 2019, that identify projects to improve water quality and reduce discharge into storm drain systems.	2, 3, 5

Notes: City = City of Lemon Grove; FEMA = Federal Emergency Management Agency; MHMP = Multijurisdictional Hazard Mitigation Plan; NFIP = National Flood Insurance Program
Source: Ascent Environmental, Inc. 2019.

4.3.2 Resiliency and Adaptation Measures

Adaptation strategies are classified into five categories to address the climate change impacts identified in the vulnerability assessment. Each category includes programs and policies to support climate adaptation and resiliency, focusing on specific vulnerabilities and impacts that have the potential to affect the City's populations, functions, and structures. The proposed strategies also have the potential to provide other important benefits to the community, or co-benefits (described in **Chapter 1**). Detailed strategies and measures are described below.

Strategy A-1: Prepare for Increases in Temperature and Extreme Heat Days

Rising temperatures caused by climate change will exacerbate the UHIE and increase the frequency and duration of extreme heat events (i.e. extreme heat days and heat waves). The City will implement the measures presented in **Table 4-4** to mitigate health effects from extreme heat events and the effects of the UHIE to protect its populations, functions, and structures.

Table 4-4 Strategy A-1: Prepare for Increases in Temperatures and Extreme Heat Events
Measure A-1.1: Improve Access to Cool Zones
The City will work with local agencies, businesses, and institutions to promote "Cool Zones" and improve access for residents vulnerable to extreme heat, such as small children, people with chronic diseases, low-income populations, outdoor workers, and the elderly.
Measure A-1.2: Increase Green Infrastructure
The City will incorporate green infrastructure elements into its new and existing infrastructure to mitigate the effects of the UHIE by reducing areas of heat-absorbing paved surfaces and increasing landscaped areas with planted vegetation. Examples of green infrastructure include cool pavements (e.g., porous pavement and light-colored pavement), street trees and climate-appropriate landscaping, cool roofs, and the creation of additional greenspace.
Measure A-1.3: Increase Heat Event Public Outreach
The City will increase public outreach and education programs to inform the public of the health risks associated with extreme heat events. The City's outreach will focus primarily on providing educational opportunities for populations vulnerable to extreme heat such as children, those who are socioeconomically disadvantaged, people who work outside, and the elderly.
Measure A-1.4: Improve Building Cooling Efficiency
The City will promote the use of passive cooling design (e.g., appropriate building orientation, appropriate shade tree selection and location, window shading, cool roofs) and use the CalGreen voluntary measures for residential and nonresidential buildings to improve energy efficiency.
Measure A-1.6: Reduce Heat Island Effects at Transit Stations
The City will work with MTS to incorporate and expand shading and heat island effect reducing features at transit stations within the City. These efforts could include installing shade structure, cool roofs, cool pavements, or street trees along major routes or at major stations.
Notes: CalGreen = California Green Building Standards; City = City of Lemon Grove; MTS = San Diego Metropolitan Transit System; UHIE = Urban Heat Island Effect Source: Ascent Environmental, Inc. 2019.

Strategy A-2: Prepare for Changes in Precipitation Patterns and Water Availability

The Helix Water District provides potable water to the City and receives both imported and local water to supply its customers. Because of climate change, the City's reliance on various water resources will remain a critical issue in adapting to increased periods of drought. Considering the potential decrease in regional water resources available to the City due to changes in annual precipitation and an overall reduction in the Sierra Nevada snowpack, the City will implement the

measures presented in **Table 4-5** to increase the City's adaptation and resilience concerning water supplies.

Table 4-5 Strategy A-2: Prepare for Changes in Precipitation Patterns and Water Availability
Measure A-2.1: Support Water Conservation Efforts
The City will coordinate with local and regional water resource agencies to support and improve water conservation efforts and programs for residents. This will include supporting educational outreach to residents, especially populations vulnerable to climate change, on how to best conserve water and reduce water demand.
Measure A-2.2: Require Efficient Landscapes
In support of implementation of GHG emissions reduction **Measure W-1**, the City will continue the implementation of its Best Management Practices Design Manual for new developments and redevelopment projects. As new technologies or best practices become available, the City will continue to update this manual to require efficient landscaping throughout the City.
Measure A-2.3: Encourage Greywater Systems
The City will encourage residents and businesses to install greywater systems to reduce the City's water demand.
Measure A-2.4: Promote Water Resource Projects
The City will pursue grant funding opportunities for water resource planning projects, when available, and will coordinate with local and regional water districts to develop local water supplies that would not be affected by climate change (e.g., advanced water purification). Specifically, the City will work with Helix Water District to promote diversification of water supplies, desalination as a drought-proof water supply, and increased efficiency of water transfers.
Notes: City = City of Lemon Grove Source: Ascent Environmental, Inc. 2019.

Strategy A-3: Prepare for Increased Flood Risk

Extreme precipitation events can lead to flooding and other damaging effects. Emissions scenarios from Cal-Adapt regarding increased extreme precipitation event frequency and intensity demonstrate the City's need to develop specific measures to help prepare for increased flood risks. The City will implement the measures identified in **Table 4-6** to adapt to increased flooding events.

Table 4-6 Strategy A-3: Prepare for Increase Flood Risk
Measure A-3.1: Develop Emergency Preparedness Plans
The City will coordinate with relevant agencies (e.g., FEMA, CalOES, Heartland Fire Department) to identify, plan, and prepare necessary emergency services required to contend with flooding events, including evacuation services, flood management services, and recovery services.
Measure A-3.2: Enhance Flood Control
The City will seek grants and other sources of funding, including the State's Integrated Regional Water Management Grant Program and mitigation opportunities, to enhance flood control and improve water quality.

Table 4-6 Strategy A-3: Prepare for Increase Flood Risk
Measure A-3.3: Promote Ecosystem Restoration
The City will promote and/or engage in local and regional ecosystem restoration efforts that will result in increased climate resiliency for flooding events within the City.

Notes: CalOES = California Office of Emergency Services; City = City of Lemon Grove; FEMA = Federal Emergency Management Agency
Source: Ascent Environmental, Inc. 2019.

Strategy A-4; Prepare for Increased Wildfire Risk

Like many communities in the San Diego region, the City will likely experience increased wildfire risk in the future. Though the City is primarily urban and surrounded by other urban areas, the increased frequency and intensity of wildfires throughout the region would threaten health and safety within the City. The City would implement the measures identified in **Table 4-7** to increase resiliency to wildfires through community education and new development requirements.

Table 4-7 Strategy A-4: Prepare for Increase Wildfire Risk
Measure A-4.1: Participate in a Community Alert System
The City will participate in the development of future community alert systems or notification systems that provide information to residents and business owners related to wildfires.
Measure A-4.2: Update City Code Requirements
The City will monitor new wildfire-related laws and regulations from the State legislation and will incorporate applicable regulations into the City's Municipal Code. The City will encourage the use of fire-resistant building design, materials, and landscaping.
Measure A-4.3: Preserve, Protect, and Restore Native Habitats
The City will explore funding opportunities to preserve, protect, and restore native habitats. The City will monitor/control invasive species by encouraging the removal of non-native vegetation from fire-prone areas.
Measure A-4.4: Maintain Fire Emergency Services
The City will continue to work with the Heartland Fire District to ensure adequate fire emergency services and resources are available to City residents and businesses.

Notes: City = City of Lemon Grove
Source: Ascent Environmental, Inc. 2019.

Strategy A-5: Prepare for Increased Demand on Infrastructure

Extreme and prolonged high temperatures threaten local energy supply due to high demand for electricity use, which burdens the ability of the utility provider to meet increased demand. Surges in energy use in the City and the San Diego region may cause brownouts or blackouts. Changes in precipitation patterns would result in increased demand for water storage to provide water during droughts and increased stormwater infrastructure capacity during extreme precipitation events. Climate change effects will put additional stress on the City's infrastructure. Measures to prepare for increased demand on infrastructure are provided in **Table 4-8**.

Table 4-8 Strategy A-5: Prepare for Increased Demand on Infrastructure
Measure A-5.1: Promote the Use of Solar Carports
The City will promote the use of solar carports on new and existing surface parking lots to mitigate heat absorption and increase shaded areas for the City's population. The implementation priority would be given to City-owned parking lots to serve as example solar carports. Solar carports would provide increased solar energy generation, reducing demand on existing generation facilities to serve future electricity needs in the City.
Measure A-5.2: Promote Climate-Adaptive Building Design
The City will promote climate-adaptive design (e.g. cool roofs) of buildings, public areas, and infrastructure to reduce reliance on mechanical cooling and energy use.
Measure A-5.3: Assess Stormwater and Wastewater Infrastructure
The City will continue to assess all stormwater and wastewater infrastructure in the City and analyze how this infrastructure may be affected or compromised by increased risk of extreme precipitation or flooding events when completing infrastructure projects.
Measure A-5.4: Promote Energy Efficiency
The City will encourage residents and businesses to adopt energy efficient practices to reduce energy and water demand, and optimize time-of-use.
Measure A-5.5: Encourage Renewable Energy Generation
In addition to the GHG reduction measures identified in this CAP, the City will encourage the development of solar-based or other renewable energy sources within the City and the larger region.
Notes: CAP = Climate Action Plan; City = City of Lemon Grove; GHG = greenhouse gas Source: Ascent Environmental, Inc. 2019.

4.4 Conclusion

Source: City of Lemon Grove

The City's efforts to adapt to climate change effects will be implemented alongside the GHG reduction measures identified in **Chapter 3**. Implementation of the five adaptation strategies and the 22 associated measures will provide alternative methods beyond GHG reduction measures for the City to address climate change impacts. Though not quantified within this CAP, several adaptation strategies and measures would result in additional GHG reduction benefits from actions such as increasing building efficiency, reducing water consumption, and adopting other sustainable practices. The implementation of adaptation strategies and measures alongside the GHG reduction measures would assist the City in actively combating and adapting to climate change.

05 Implementation and Monitoring

5.1 Introduction

This chapter outlines how the City of Lemon Grove (City) will implement and monitor the Climate Action Plan (CAP) strategies and measures over time to reduce greenhouse gases (GHGs) and adapt to climate change. To achieve the GHG emissions reductions and adaptation strategies described in **Chapters 3** and **4**, measures should also be continuously assessed and monitored to ensure that: (1) the measures are effective; (2) the CAP is on track to achieve the GHG reduction targets; and (3) desired community outcomes are attained.

5.2 Implementation Strategy

Implementation of the recommended reduction measures will require ongoing management, oversight, and staffing. Ensuring that the measures translate to on-the-ground results and reductions in GHG emissions is critical to the success of the CAP. Success of the City's CAP and GHG emissions reduction measures will depend on the participation of the City's residents, businesses, and local government entities.

This chapter describes how City staff will implement CAP measures, and how the CAP will be updated over time to ensure continued effectiveness and relevance of the document.

To achieve GHG reduction targets, an implementation strategy is required to determine the priority of the strategies described in Chapter 3. Priorities depend on a variety of factors, including cost, staff resources needed, ease of implementation, and timeframe of strategy implementation in order to achieve State and local targets. To continue successful implementation of the CAP strategies, the City will further expand on this initial examination once implementation has begun.

The City will prepare an implementation plan to ensure measures are **actionable** and implementation priorities are identified for each emissions reduction measure.

5.2.1 Implementation Activities

The City will implement strategies and measures of the CAP through several types of programs and activities that can be grouped into categories. The categories identified for implementation activities include: Municipal Operations; New Ordinances and Code Updates; Planning; Financing and Incentives; Partnerships; and Education and Outreach. While each measure identified in the CAP would fall into one of these categories, some measures overlap and belong to more than one category. For example, reducing solid waste disposal (**Measure S-1**) first requires partnerships with existing waste haulers to ensure solid waste is handled appropriately, but would also require education to inform residents on proper solid waste sorting and reduction strategies. Detailed descriptions of each category are provided below.

Municipal Operations: Many measures included in this CAP require specific City actions to update and make municipal operations more efficient. Examples include increasing the amount of renewable energy generated at municipal facilities (**Measure E-5**) and increasing the efficiency of streetlights by 40 percent (**Measure E-1**). These measures would be

implemented by the City and would reduce emissions specifically related to municipal operations.

New Ordinances and Code Updates: Several of the measures in the CAP would be implemented through new ordinances or amended regulations adopted by the City. Examples of measures that require municipal approval include requiring new and existing developments to increase the number of onsite electric vehicle (EV) charging stations (**Measure T-3**) and reducing the amount of residential parking near trolley stations (**Measure T-11**). New ordinances will ensure that the City requirements are in place to achieve the objectives of the CAP.

Source: City of Lemon Grove

Planning: The CAP identifies measures that are more programmatic in nature and that require visioning and a larger planning effort to realize GHG reductions. Examples of implementation or development of a variety of planning documents or programs include an Urban Tree Planting Program (**Measure C-1**) and a citywide Transportation Demand Management Plan (**Measure T-8**).

Financing and Incentives: Identifying mechanisms for funding and allocating resources will help ensure that the CAP is successfully implemented. Strategies and measures identified in the CAP would be implemented by community residents, business owners, and developers with opportunities and incentives to contribute to citywide GHG reductions. Promoting financing and incentive programs, like the San Diego Association of Governments (SANDAG) iCommute program (**Measure T-7**), increases the participation in achieving citywide reduction goals.

Partnerships: Interagency coordination and partnerships with other organizations are critical to ensuring implementation of certain measures. This includes collaboration with the San Diego Metropolitan Transit System (MTS) on increasing citywide commutes on transit (**Measure T-13**), with local school districts to track electric bus purchases (**Measure T-4**) and track the number of students walking/biking to school (**Measure T-9**), and with other government agencies, transportation agencies, and waste haulers in the region.

Source: City of Lemon Grove

Education and Outreach: Educational efforts about the objectives of the CAP will help create support for the CAP and involve the community in its implementation. Informing residents and business owners about the co-benefits of GHG reduction measures would encourage participation and awareness of the goals of the CAP.

The **inclusive** implementation strategy identifies which departments are primarily responsible for implementation and where partnerships are necessary for measure success.

5.2.2 Implementation Timeframe

The timeframe over which strategies are implemented varies between both short-term (i.e. within a couple years) and long-term (i.e. within several years). Prioritization of the measures is based on a timeframe in which measures can be implemented. Certain measures should be prioritized early because they would require more effort and would take longer to implement, and assigning such measures a higher priority would allow the City to allocate resources appropriately. Generally, timeframes associated with each measure can be categorized as follows:

- **On-going:** Implementation is already occurring
- **Short-term:** Implementation will occur within the next three years
- **Mid-term:** Implementation will occur within approximately five years
- **Long-term:** Implementation will occur within or beyond the next seven years

5.2.3 Implementation Effort

Levels of effort required to implement measures are based on implementation cost and ease of implementation, which were both evaluated for all CAP measures based on a scale of low, medium, or high. Consideration of staff implementation costs and the overall feasibility of implementation is needed to guide CAP measure implementation. Staff implementation costs are based on the anticipated levels of resources, staffing, and timeframe required to implement each measure. Implementation costs are not intended to represent the relative costs of compliance for residents and businesses, but rather focuses on the City's relative costs to facilitate program development and implementation. Ease of implementation is based on whether there are already existing programs that are related, coordination between different departments or agencies, and the comparison between existing and proposed strategies.

The implementation efforts provide an assessment of the relative costs of measure implementation. Identifying implementation efforts and departments responsible ensures **fair** distribution of resources throughout the City.

Sample criteria used to define the implementation efforts for each measure are shown in **Table 5-1**. It is possible for a measure to have a mix of implementation effort levels (i.e. have low staff implementation costs and high ease of implementation).

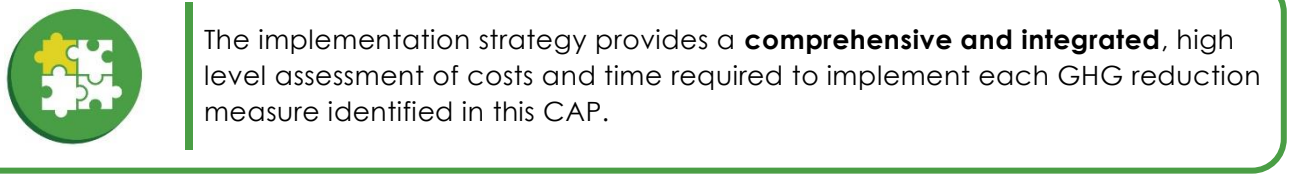
Table 5-1 Implementation Effort Sample Criteria

Implementation Effort Level	Staff Implementation Costs	Ease of Implementation
Low	▪ Requires limited resources of current staff ▪ Existing staff can implement but will require reprioritization of workload	▪ Existing programs in place to support implementation ▪ Limited external and internal coordination required ▪ Limited revisions to policy or code
Medium	▪ Requires staff resources beyond current capacity ▪ Requires new part-time staff or contracts to implement	▪ Requires external and internal coordination ▪ Involves policy or code revisions ▪ The amount of funding needed for implementation is known and it can be acquired
High	▪ Requires extensive staff resources ▪ Requires a significant number of new staff or contracts to implement	▪ Requires revisions to the General Plan or development of new policies, programs, or codes ▪ Requires robust outreach programs to residents and businesses ▪ Requires regional cooperation ▪ Requires securing long-term funding

Source: Ascent Environmental 2019.

5.2.4 Implementation Strategy Matrix

The implementation strategy matrix, outlined below in **Table 5-2**, provides a summary of the initial prioritization and categorization of the CAP's strategies and measures. The matrix includes an implementation activity type, responsible department or agency, implementation timeframe, level of implementation cost, and ease of implementation for each measure. Following adoption of the CAP, this implementation strategy matrix will serve as initial guidance for City staff. Future updates to the CAP will require the matrix to be adjusted according to feasibility and legislative requirements. Key staff in each department or agency will facilitate and oversee measure implementation, allocate staff resources, and secure funding as needed.



The implementation strategy provides a **comprehensive and integrated**, high level assessment of costs and time required to implement each GHG reduction measure identified in this CAP.

Following approval of this CAP, the City will develop an Implementation Plan that will outline the actions the City will undertake to reduce its GHG emissions. This Implementation Plan will build upon the strategies, measures, and implementation costs included in this CAP and further develop the information presented in this chapter. The Implementation Plan will include specific steps required to implement each CAP strategy and serve as a reference document for City staff to identify implementation tasks, timelines, and responsible departments. The Implementation Plan may need to reflect adjusted timeframes due to budget constraints.

Table 5-2 Implementation Strategy Matrix

Measure	Title	Category	Responsible Department/ Agency	Implementation Timeframe	Staff Implementation Costs	Ease of Implementation
Strategy 1: Increase Use of Zero-Emission or Alternative Fuel Vehicles						
T-1	Transition to a Clean and More Fuel-Efficient Municipal Vehicle Fleet	Municipal Operations	PW	Mid- to Long-Term	Low	Low
T-2	Install EV Charging Stations at Municipal Facilities	Municipal Operations	PW	Mid- to Long-Term	Low	Medium
T-3	Increase the Number of EV Charging Stations at New and Existing Private Developments	New Ordinances and Code Updates	CD	Mid-Term	Low	Medium
T-4	Transition to an Electric School Bus Fleet	Partnerships	GUHSD; LGSD; CD	Mid- to Long-Term	Low	Medium
Strategy 2: Reduce Fossil Fuel Use						
T-5	Synchronize Traffic Signals	Municipal Operations	PW	Mid- to Long-Term	Low	Medium
T-6	Increase Renewable and Alternative Fuel Use in Construction Equipment	New Ordinances and Code Updates	CD	Short-Term	Low	Low
Strategy 3: Reduce Vehicle Miles Traveled						
T-7	Participate in SANDAG's iCommute Vanpool Program	Partnerships	CM; CD	Ongoing	Low	Low
T-8	Develop a Citywide TDM Plan	Planning	CD	Short-Term	Medium	Medium
T-9	Implement the Safe Routes to School Program	Education and Outreach	CD; LGSD	Ongoing	Low	Low
T-10	Increase Commute by Bicycle	Planning	CD	Ongoing	Low	Medium
T-11	Reduce Residential Parking Requirements Near Trolley Stations	New Ordinances and Code Updates; Planning	CD	Mid-Term	Medium	Medium
T-12	Transition to an Online Building Permits Submittal System	Municipal Operations	CD; CM	Mid- to Long-Term	Low	Low
T-13	Increase Commute by Transit	Planning; Partnerships	CD; MTS	Mid- to Long-Term	Medium	Medium
Strategy 4: Increase Building Energy Efficiency						
E-1	Increase Street Lighting Efficiency Citywide	Municipal Operations	PW	Ongoing	Low	Medium
E-2	Reduce Non-Residential Energy Use	Financing and Incentives; Education and Outreach	CD; CM	Mid-Term	Medium	Medium

Table 5-2 Implementation Strategy Matrix

Measure	Title	Category	Responsible Department/ Agency	Implementation Timeframe	Staff Implementation Costs	Ease of Implementation
E-3	Reduce Residential Energy Use	Financing and Incentives; Education and Outreach	CD; CM	Mid-Term	Medium	Medium
Strategy 5: Increase Renewable and Zero Carbon Energy						
E-4	Increase Renewable Energy Generation at Non-Residential and Multi-Family Developments	New Ordinances and Code Updates	CD	Mid-Term	Low	Medium
E-5	Achieve Zero Net Energy Municipal Operations	Municipal Operations	PW	Ongoing	Medium	High
E-6	Require New Residential Uses to be All-Electric and Generate Renewable Energy On-Site	New Ordinances and Code Updates; Education and Outreach	CD	Mid-Term	Low	High
E-7	Increase Grid-Supply Renewable and Zero-Carbon Electricity	Financing and Incentives; Partnerships; Education and Outreach	CD; CM	Ongoing	Medium	High
Strategy 6: Increase Water Efficiency						
W-1	Increase Outdoor Water Efficiency	New Ordinances and Code Updates	CD	Ongoing	Low	Low
W-2	Reduce Water Use at City Parks and Municipal Facilities	Municipal Operations	PW	Ongoing	Low	Medium
Strategy 7: Reduce and Recycle Solid Waste						
S-1	Increase Citywide Waste Diversion	New Ordinances and Code Updates; Partnerships	CD; PW	Mid-Term	Medium	High
Strategy 8: Carbon Sequestration						
C-1	Develop a Citywide Urban Tree Planting Program	Planning	CD; PW	Short-Term	Low	Medium
C-2	Increase Tree Planting at New Developments	New Ordinances and Code Updates	CD	Short-Term	Low	Low

Notes: CD = Community Development Department; CM = City Manager's Office; Eng = Engineering Department; EV = electric vehicle; GUHSD = Grossmont Union High School District; LGSD = Lemon Grove School District; MTS = San Diego Metropolitan Transit System; PW = Public Works; SANDAG = San Diego Association of Governments; TDM = Transportation Demand Management
Source: Ascent Environmental, Inc. 2019.

5.3 Monitoring and Updates

The CAP lays out a broad-based strategy to reduce GHG emissions and improve the sustainability and resilience of the community. However, the CAP will need to be updated and maintained if it is to remain relevant and effective. Thus, City staff will need to evaluate and monitor plan performance over time and make recommendations to alter or amend the plan if it is not achieving the proposed reduction targets. This will include conducting periodic GHG emissions inventory updates and analyzing measure performance.

The City will continuously monitor CAP implementation progress and provide **transparent and verifiable** reports to City Council and the public.

The City will begin implementing the CAP's measures upon adoption and start-up, and initiation of data tracking will begin two years following CAP adoption. City staff will also present summaries of CAP progress to City Council. These update presentations would include summaries of achievements to date and provide transparency and promote engagement with the public after CAP adoption. Through the climate planning services offered via its Roadmap Program, SANDAG is updating GHG emissions inventories for the cities in the San Diego region every two years, beginning with the 2016 baseline year. The City will seek to coordinate updates to its GHG inventory to remain consistent with SANDAG's schedule, beginning with the 2018 baseline year.

In addition to updating the City's emissions inventory, City staff will also evaluate the cost, effectiveness, and benefits of each individual measure. Evaluating CAP measure performance entails monitoring the level of community participation, costs, and barriers to implementation, as well as actual reductions in fuel consumption, vehicle miles traveled, energy usage, water usage, landfilled waste, or other activities that result in GHG emissions reductions. By evaluating whether implementation of a measure is on track to achieve its reduction potential, the City can identify successful measures and reevaluate or replace under-performing ones.

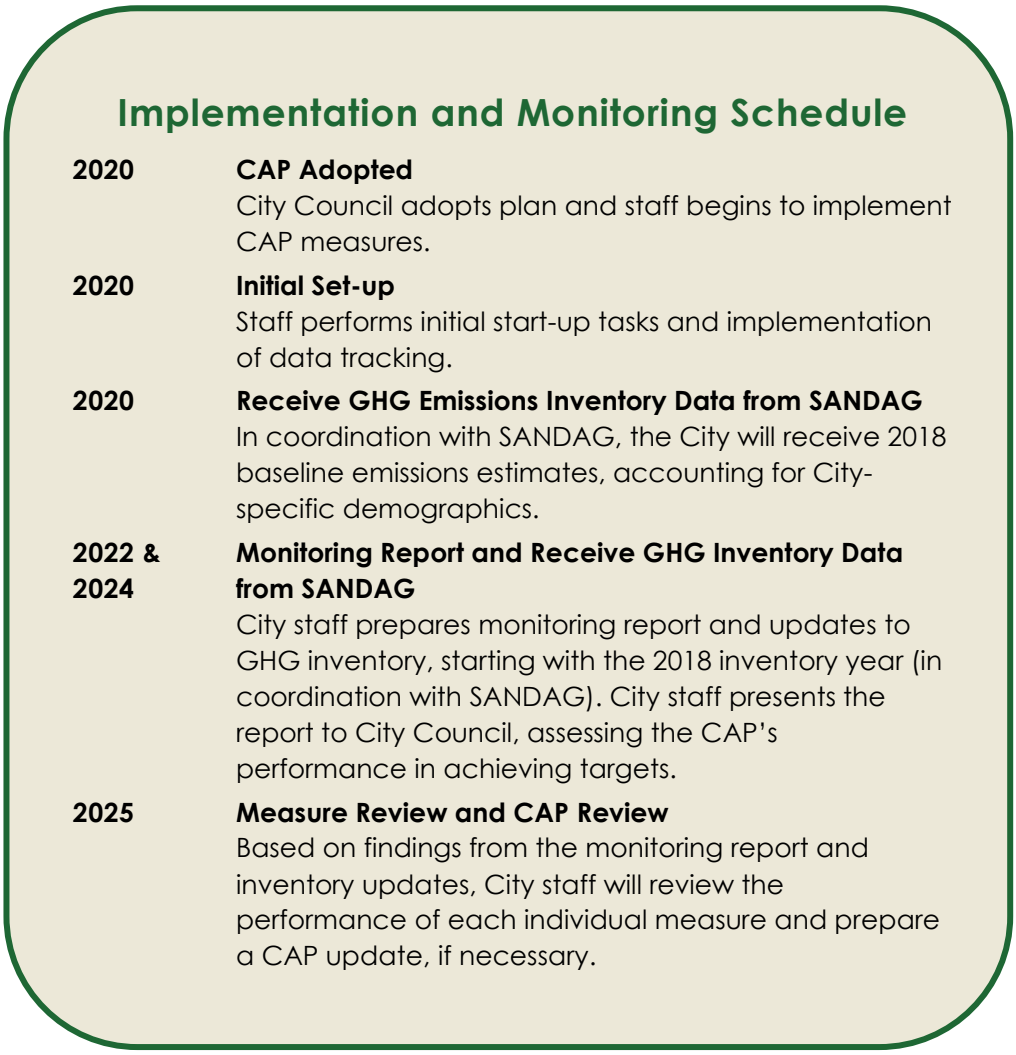
Source: City of Lemon Grove

City staff will prepare a monitoring report in conjunction with an inventory update. This report will provide updates on CAP implementation progress, the GHG reductions achieved to date, and other important milestones in the CAP implementation process. As technologies and markets change and the City implements the measures in the CAP, these reports will be used to track progress and identify measures that need to be improved, adjusted, or removed. The report will also serve to inform City Council and the general public about implementation progress on measures, as well as overall progress towards the City's GHG reduction targets.

Finally, the City will prepare a CAP update every five years, beginning in 2025. CAP updates would reflect the findings and recommendations of the monitoring reports and inventory updates. Future

CAP updates would be necessary to account for any new State or federal legislation that may affect the CAP, and to focus on GHG reduction strategies that may have been difficult to implement previously due to a lack of appropriate technologies or high upfront implementation costs.

Figure 5-1 outlines the CAP implementation and monitoring schedule.



Source: Ascent Environmental, Inc. 2019.

Figure 5-1 Climate Action Plan Implementation and Monitoring Schedule

5.4 Ongoing Engagement

As the City continues to implement and monitor progress on the CAP, continued engagement with, and participation by the community is critical. This includes individual residents and businesses, community organizations, developers, property owners, other local and regional government agencies, and others. While this CAP focuses on measures in which the City has a role, many of the measures require partnership and collaboration.

The City is also committed to public education about the important role individuals play in combating climate change. Effective and long-term climate action and resiliency in the City can only be

achieved through efforts that continue to change the way individuals interact with the environment. Many of the measures in **Chapter 3**, as well as the adaptation strategies in **Chapter 4**, are focused on increasing community awareness and participation in existing programs or connecting the community with new information, tools, funding, or resources to take action. Thus, this CAP serves as a resource that supports community-based action.

5.5 Funding Sources

The City will incur costs to implement CAP measures. These include initial start-up, ongoing administration, staffing, and enforcement costs. While some measures will only require funding from public entities, others would result in increased costs for businesses, new construction, and residents. However, implementation of CAP measures will result in substantial cost-savings for the City, residents, and business owners in the long term. The City will be proactive in seeking cost-effective implementation and strategic funding opportunities and developing partnerships to lessen the burden of implementation costs. All measures with potential for significant costs will be brought to City Council for consideration and approval.

Ultimate success of CAP implementation will rely on the City's **ambitious** implementation efforts to achieve GHG emissions reductions.

Success of the CAP will require capital improvements, investments, and increased operations and maintenance costs. The summary of current funding and financing options are provided in **Table 5-3** below. Funding options are included from a variety of sources, including the City, regional agencies such as SANDAG, or San Diego Gas & Electric (SDG&E). The City will monitor private and public funding sources for new grant and rebate opportunities, as funding sources and programs are subject to change over time. Leveraging funding opportunities would facilitate successful implementation of the GHG reduction measures. The City will continue to search for new funding sources through the State's Climate Change Funding Wizard website, which provides the most up-to-date information on funding opportunities for projects for climate change mitigation and adaptation.

The state's **Climate Change Funding Wizard** provides updates for funding available to cities, residents, and businesses to reduce GHG emissions and improve local resiliency.

Table 5-3 Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
City	
California Department of Resources Recycling and Recovery (CalRecycle)	▪ CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. ▪ Incorporated cities and counties in California are eligible for funds. ▪ Program funds are intended to: • Reduce, reuse, and recycle all waste. • Encourage development of recycled-content products and markets. • Protect public health and safety and foster environmental sustainability.

Table 5-3 Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
California Air Resources Board (CARB)	▪ CARB offers several grants, incentives, and credit programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. ▪ The following programs can be utilized to fund local measures: • Air Quality Improvement Program (Assembly Bill 118) • Loan Incentives Program • California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project
Transportation-Related Federal and State Funding	▪ For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources from SANDAG may be utilized: • Smart Growth Incentive Program • Active Transportation Grant Program • Job Access and Reverse Commute and New Freedom Programs • Specialized Transportation Grant Program
New Development Impact Fees	▪ These types of fees may have some potential to provide funding for proposed programs and projects, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
General Obligation Bond	▪ A general obligation bond is a form of long-term borrowing and could be utilized to fund municipal improvements.
Other Funding Mechanisms for Implementation	▪ Grants may be available from the Strategic Growth Council or the State Department of Conservation to fund sustainable community planning, natural resource conservation, and development, and adoption.
Community	
San Diego Gas & Electric (SDG&E)	▪ SDG&E is one of the utilities participating in the Go Solar initiative. ▪ A variety of rebates are available for existing and new homes. ▪ Photovoltaics, thermal technologies, and solar hot water projects are eligible. ▪ Single-family homes, commercial development, and affordable housing are eligible.
Property-Assessed Clean Energy (PACE)	▪ The PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments. ▪ Municipalities are authorized to designate areas where property owners can enter into contractual assessments to receive long-term, low-interest loans for energy and water efficiency improvements, and renewable energy installation on their property. ▪ Financing is repaid through property tax bills.

Table 5-3 Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
	▪ SANDAG has implemented the Home Energy Renovation Opportunity (HERO; a PACE program) in San Diego County to assist residents in financing residential energy efficiency and solar retrofits.
Clean Vehicle Rebate Program	▪ Individual, fleet operators, local government entities, and businesses can apply for rebates for purchases of plug-in electric hybrids, battery electric vehicles (BEVs), fuel-cell electric vehicles, and other non-highway, motorcycle and commercial BEVs.
Energy Upgrade California	▪ Program is intended for home energy upgrades. ▪ Funded by the American Recovery and Reinvestment Act, California utility ratepayers, and private contributions. ▪ Utilities administer the program, offering homeowners the choice of one of two upgrade packages—basic or advanced. ▪ Homeowners are connected to home energy professionals. ▪ Rebates, incentives, and financing are available. ▪ Homeowners can receive up to $4,000 back on an upgrade through the local utility.
Federal Tax Credits for Energy Efficiency	▪ Tax credits for energy efficiency can be promoted to residents.
Energy Efficient Mortgages (EEM)	▪ An EEM is a mortgage that credits a home's energy efficiency in the mortgage itself. ▪ Residents can finance energy saving measures as part of a single mortgage. ▪ To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. ▪ EEMs typically are used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home.
Private Funding	▪ Private equity can be used to finance energy improvements, with returns realized as future cost savings. ▪ Rent increases can fund retrofits in commercial buildings. ▪ Net energy cost savings can fund retrofits in households. ▪ Power Purchase Agreements (PPA) involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract. ▪ On-Bill Financing (OBF) can be promoted to businesses for energy-efficiency retrofits. Funding from OBF is a no-interest loan that is paid back through the monthly utility bill. Lighting, refrigeration, heating, ventilation, and air conditioning, and light-emitting diode streetlights are all eligible projects.

Table 5-3 Potential Funding Sources to Support GHG Reduction Measures

Funding Source	Description
Community Choice Aggregation (CCA) Revenue	▪ Revenue generated by a local CCA program may be used to fund or incentivize GHG reduction measures.
Housing Rehabilitation Loan Programs	▪ Critical Home Repair Program through Habitat for Humanity provides home improvements for low-income homeowners to improve home efficiency, safety, and accessibility. ▪ The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant program provides communities with resources to address redevelopment needs, specifically for home rehabilitation. ▪ HUD also administers the HOME program, providing grants to improve affordable housing opportunities and conditions.
General	
CivicSpark Program	▪ Supports sustainability-focused research, planning, and implementation projects throughout California by providing public agencies and other organizations with capacity building support and community engagement ▪ Provides volunteer engagement through AmeriCorps fellows to provide added staff capacity for eleven months
California Climate Investments (CCI)	▪ CCI is the statewide initiative that provides funds from the Cap-and-Trade program for GHG reducing projects and programs. ▪ Funds can support a variety of projects including affordable housing, renewable energy, public transportation, zero-emission vehicles, environmental restoration, sustainable agriculture, recycling, and more. ▪ Numerous state programs listed above are funded by CCI; however, the program continues to evolve and is updated by the state periodically to include new or modified programs.

Source: Ascent Environmental 2019.

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