CITY OF LA MESA

Climate Action Plan

Public Review Draft | May 2015

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City of La Mesa City Council:

Mayor Mark Arapostathis

Vice Mayor Ruth Sterling

Councilmember Kristine C. Alessio

Councilmember Bill Baber

Councilmember Guy McWhirter

City Staff:

David E. Witt, City Manager

Yvonne Garrett, Assistant City Manager, Community Services Director

Bill Chopyk, Community Development Director

Chris Jacobs, Senior Planner

Howard Lee, Associate Planner

Alexis Brand, Intern II

Environmental Sustainability Commission:

Bradon Hoover

Linda Bethel

Robin Rivet

Mary Jane Baily

Mark Thayer

Maria Hesse

James Stone

Lisa Stoia

Maggie Eggers

Don Parent

Debi Byrd

San Diego Gas and Electric:

Kimberly Burke, Local Government Partnerships

Amanda Winchell, Technical Specialist

San Diego Association of Governments:

Susan Freedman, Senior Regional Energy Planner

AECOM:

Yara Fisher, Project Director

Matthew Gerken, Project Manager

Josh Lathan, Sustainability Planner

Lisa Reynolds, Planner

George Lu, Lead Greenhouse Gas Analyst

EPIC:

Nilmini Silva-Send, Senior Energy Policy Analyst

CONTENTS

Figures

Tables

ACRONYMS & OTHER ABBREVIATIONS

Acronyms	Definition
AB	Assembly Bill
ABAU	adjusted business-as-usual
ARB	California Air Resources Board
ARRA	American Recovery and Reinvestment Act
BAU	business-as-usual
BMP	best management practice
C&D	construction and demolition
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
CO_2	carbon dioxide
CNG	compressed natural gas
CSE	Center for Sustainable Energy
CSI	California Solar Initiative
EIR	environmental impact report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPIC	Energy Policy Initiatives Center
EV	electric vehicle
FY	fiscal year
GHG	greenhouse gas
GWP	global warming potential
HPS	high pressure sodium
ICLEI	ICLEI Local Governments for Sustainability
IPCC	International Panel on Climate Change
kWh	kilowatt hour
LCFS	Low Carbon Fuel Standard
LED	light emitting diode
LEED	Leadership in Energy & Environmental Design
LPG	liquefied petroleum gas
MT CO_2e/yr	metric tons of carbon dioxide equivalent per year
MW	megawatt
N_2O	nitrous oxide
OPR	Office of Planning and Research
PACE	property-assessed clean energy
PEV	plug-in electric vehicle

Acronyms	Definition
PPA	power purchase agreement
PV	photovoltaic
RES	Regional Energy Strategy
RPS	Renewable Portfolio Standard
R-REP	Regional Renewable Energy Procurement
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
Scoping Plan	Climate Change Scoping Plan
SCS	Sustainable Community Strategy
SDAPCD	San Diego Air Pollution Control District
SDG&E	San Diego Gas and Electric Company
sqft	square feet
SRTS	Safe Routes to School
TCR	The Climate Registry
TDM	Transportation demand management
TOD	transit-oriented development
UWMP	Urban Water Management Plan
VMT	vehicle miles traveled
WARM	Waste Reduction Model
WELO	Water Efficient Landscape Ordinance
yr	year

CHAPTER 1

Planning for Climate Change

The City of La Mesa has a history of planning for healthy communities, promoting efficient resource use, and incorporating sustainability principles into municipal operations. The City has also taken numerous actions to improve the quality of life for La Mesa residents and support broad community sustainability goals. These actions include development of urban walking trails, participation in the Safe Routes to Schools program, incorporation of hybrid vehicles in the City fleet, and the rehabilitation of existing buildings. Some of these actions may also serve to reduce greenhouse gas (GHG) emissions within the community, which can help the City to achieve its adopted emissions reduction target.

As a continuation of these efforts, the City has prepared this Climate Action Plan (CAP) to provide a comprehensive strategy for reducing local GHG emissions. The City's General Plan Environmental Impact Report directed preparation of such a document to analyze emissions at the community-wide level, rather than on a project-by-project basis. This CAP represents the results of collaborative planning efforts among City staff, members of the City's Environmental Sustainability Commission, San Diego Gas and Electric (SDG&E), San Diego Association of Governments, Energy Policy Initiatives Center of the University of San Diego, and public input from La Mesa residents and its business community.

This chapter presents La Mesa's rationale for climate action planning within the context of ongoing statewide and regional efforts. It also introduces the CAP development process and primary components found within this plan. The chapter concludes with a description of the CAP's relationship to the California Environmental Quality Act (CEQA).

California's Climate Planning Efforts

La Mesa's strategy for climate protection reflects the broader context of the state, where momentum for local climate planning action in the United States primarily originates. California has long been a leader in sustainability planning, as illustrated by Governor Schwarzenegger signing Executive Order (EO) S-3-05 in 2005. EO S-3-05 recognized California's vulnerability to climate change through a reduced snowpack, exacerbation of air quality problems, and potential sea-level rise. To address the state's contribution to these concerns, the Governor established the following targets to reduce statewide GHG emissions:

- return to 2000 levels by 2010,
- return to 1990 levels by 2020, and
- achieve 80% below 1990 levels by 2050

In 2006, California became the first state in the country to adopt a statewide GHG reduction target through Assembly Bill (AB) 32. This law codifies the EO S-3-05 requirement to reduce statewide emissions to 1990 levels by 2020. This CAP describes the City's strategy for achieving emissions reductions by the year 2020 to mirror the state's reduction target embodied in AB 32. The CAP also establishes a planning framework upon which the City's future emissions reduction efforts can expand to set the City on a trajectory consistent with the state's long-term emissions targets in EO S-3-05.

AB 32 resulted in the 2008 adoption by the California Air Resources Board (ARB) of a *Climate Change Scoping Plan* (Scoping Plan), outlining the state's plan to achieve emission reductions through a mixture of direct regulations, alternative compliance mechanisms, different types of incentives, voluntary actions, market-based mechanisms, and funding.

The Scoping Plan describes strategies for emissions reductions in a range of strategy areas similar to those presented in this CAP, such as:

- energy efficiency,
- renewable energy development,
- multi-modal transportation options,
- land use planning,
- vehicle fuel efficiency,
- solid waste reduction,
- water conservation, and
- green infrastructure development.

ARB updated the Scoping Plan in 2014 to analyze progress to date towards the statewide reduction goals, and consider new strategies and technologies for future implementation.

The Scoping Plan also recommends that local governments reduce municipal operation emissions to a level approximately 15% below baseline levels by 2020 to assist in achieving the statewide 2020 reduction target (i.e., a return to 1990 levels). Recent guidance from the State Office of Planning and Research (OPR) further recommends that local governments plan to reduce their emissions on a

trajectory that would contribute to the state's long-term 2050 target expressed in EO-S-3-05 (i.e., 80% below 1990 levels). However, at this time this is simply guidance, and there are no specific targets or requirements for local climate action planning.

CLIMATE CHANGE SCIENCE

Climate scientists around the world, represented by the Intergovernmental Panel on Climate Change (IPCC), have presented a clear position with regard to the effects of human activity on the earth's atmosphere. Their position is that the release of GHG emissions from human activities, particularly the release of GHGs through the combustion of fossil fuel, is changing the earth's climate. It is also their position that based on the accelerated rate of change, the longer communities delay in taking action, the greater the risk humans face of depleting nonrenewable resources and irreversibly damaging the planet's environment. Unless policies and programs are implemented to reverse this trend, it is conceivable that humans will not take necessary actions quickly enough to prevent permanent, and possibly catastrophic damage. At a statewide level, damaging impacts include reduced snow pack in the Sierra Nevada affecting California water supplies; rising sea levels threatening cities along the coast, bays and estuaries, and the state's rivers; decreasing air quality affecting public health; and, rising temperatures impacting the state's agricultural industry. This CAP is designed to reduce local contributions of GHG emissions that contribute to global climate change.

Purpose of a Climate Action Plan

At its basic level, this CAP represents a roadmap by which La Mesa can reduce its contributions of GHG emissions through the development of strategies that are informed by the community's goals, values, and priorities. Throughout California, communities are developing CAPs to support the state's broad climate protection efforts, while simultaneously advancing local initiatives to improve community health and safety, reduce transportation and utility costs, facilitate locally beneficial development projects, and enhance collaboration on regional planning strategies.

BENEFITS OF ADDRESSING GHG EMISSIONS

In addition to reducing local emissions levels, implementation of the CAP's strategies will provide co-benefits to the community. This CAP proposes measures that would improve the quality of life within La Mesa, such as reducing resident and business utility costs through efficiency improvements, enhancing bicyclist and pedestrian safety, improving local air quality, and extending the operational life of local landfills through waste diversion activities. Figure 1.1 depicts some of the co-benefits associated with CAP implementation.

Figure 1.1 – CAP Measure Co-Benefits

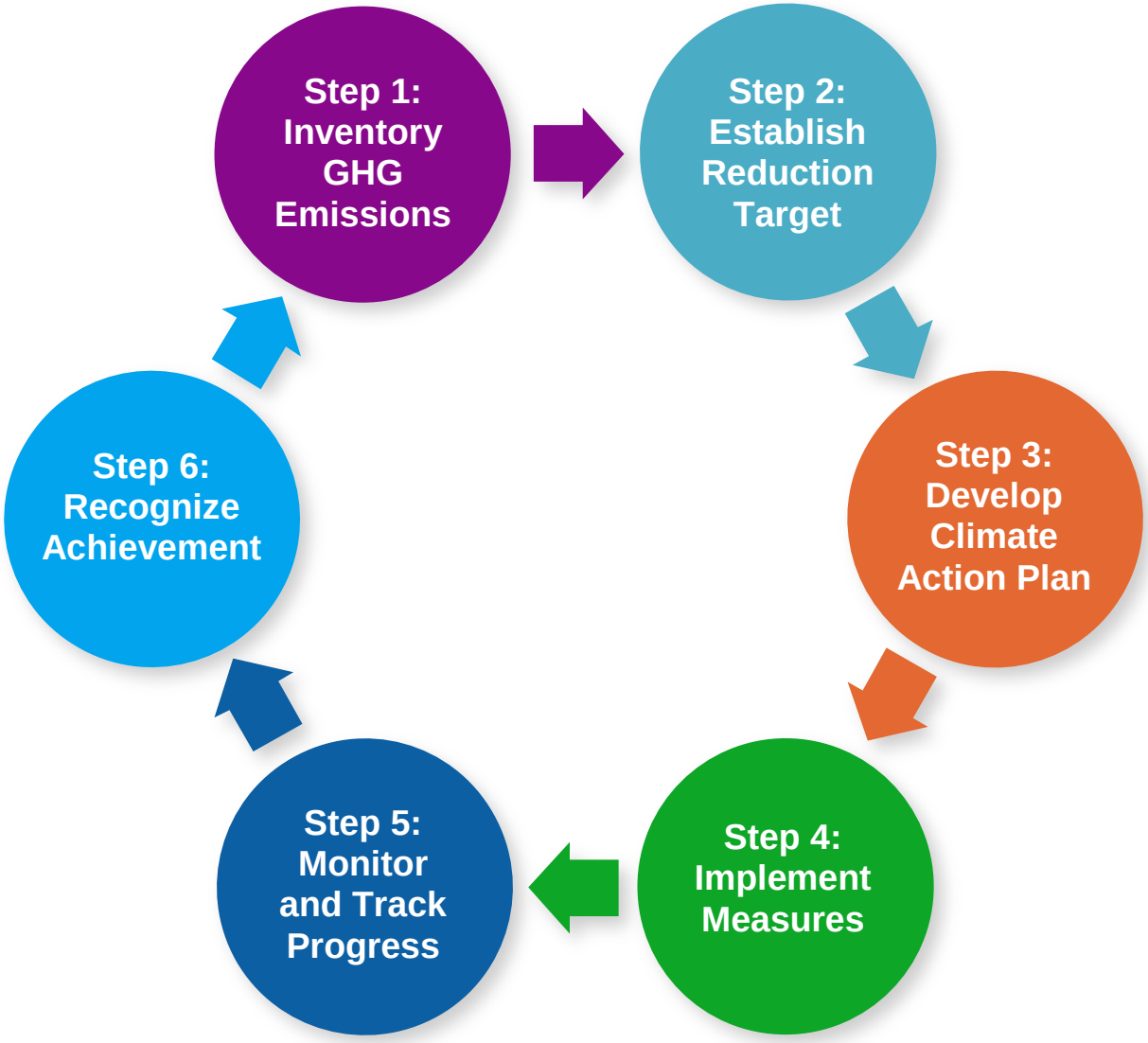
Components of a Climate Action Plan

A CAP is a tool that many cities in California are using to quantify their share of statewide GHG emissions and establish action steps toward achieving a local emissions reduction target. CAPs provide a set of strategies intended to guide community efforts to reduce GHG emissions, typically through a combination of statewide and local actions. CAPs can be developed to address community-wide emissions (i.e., total emissions within a jurisdictional boundary) and/or municipal government emissions (i.e., emissions resulting from the provision of government services). La Mesa has prepared its CAP to address climate change mitigation opportunities from the community-wide perspective. Figure 1.2 illustrates the general steps within the CAP development and implementation process as an iterative practice to be continually pursued and refined.

A baseline inventory is prepared as a starting point to quantify community-specific GHG emissions. The inventory is then used to forecast probable future emissions based on population and employment growth projections (Step 1). A reduction target is defined to provide an aspirational goal for emissions level

improvement (Step 2). Emissions reduction strategies and implementation programs are then developed within the context of a comprehensive strategic plan to help the City achieve its reduction target (Step 3). Upon adoption of the CAP, implementation of the established reduction measures can begin (Step 4), followed by progress monitoring toward target achievement and plan updates (Step 5). Celebrating successes and recognizing milestone achievements is an important step in the implementation process, particularly as a way to continually engage with community members on CAP-related issues (Step 6). This CAP represents the community's progress on Steps 1-3.

Figure 1.2 – CAP Development Process



Existing Climate Planning Efforts

Since the adoption of AB 32, climate planning efforts have expanded at the state, regional, and local levels. The following sections provide an overview of the myriad programs, actions, and collaborative planning partnerships currently underway in the state and the San Diego Region.

STATEWIDE ACTIONS

AB 32 engendered several companion laws that can assist La Mesa in reducing community-wide GHG emissions. These legislative actions and regulations are referred to as statewide actions throughout this plan, and represent a significant source of the estimated GHG reductions. This CAP estimated the emission reductions associated with:

- the Renewable Portfolio Standard,
- AB 1109 – Lighting Efficiency
- AB 1493 – Pavley I and II,
- EO-S-1-07 – Low Carbon Fuel Standard, and
- Heavy-Duty Vehicle Aerodynamic Efficiency Regulations.

In the future, as the regulatory framework surrounding AB 32 continues to grow, the City may be able to evaluate a wider range of statewide reductions. Additional statewide action will be needed to achieve the state's longer-tem and more aggressive reduction targets. Although currently unknown, a reasonable assumption would be that future statewide actions might account for a similar percentage of community-wide reductions against longer-term targets (statewide actions accounting for 79% of the 2020 reduction target). Please see Chapter 2 for more information about reduction targets and Chapter 3 for more information about future statewide and local action.

Renewable Portfolio Standard

Senate Bill (SB) 1078, SB 107, EO-S-14-08, and SB X1-2 have established increasingly stringent renewable portfolio standard (RPS) requirements for California's utility companies. RPS-eligible energy sources include wind, solar, geothermal, biomass, and small-scale hydro projects.

- **SB 1078** required investor-owned utilities to provide at least 20% of their electricity from renewable resources by 2020.
- **SB 107** accelerated the SB 1078 timeframe to take effect in 2010.
- **EO-S-14-08** increased the RPS further to 33% by 2020.
- **SB X1-2** codified the 33% RPS requirement established by EO-S-14-08.

AB 1109 – Lighting Efficiency

AB 1109 was signed into law in 2007. The California Lighting Efficiency and Toxics Reduction Act requires the California Energy Commission (CEC) to adopt energy efficiency standards for all general purpose lights, reducing lighting energy use in indoor residences and state facilities by no less than 50%

by 2018, as well as require a 25% reduction in commercial facilities by that same date. To achieve these efficiency levels, the CEC applied its existing appliance efficiency standards to include lighting products, as well as required minimum lumen/watt standards for different categories of lighting products. In addition, the bill prohibits the manufacturing for sale or the sale of certain general purpose lights that contain hazardous substances.

AB 1493 – Pavley I and II

AB 1493, California's mobile-source GHG emissions regulations for passenger vehicles, or California Clean Car Standards, was signed into law in 2002. AB 1493 requires ARB to develop and adopt regulations that reduce GHG emissions from passenger vehicles, light-duty trucks, and other non-commercial vehicles for personal transportation. In 2004, ARB approved amendments to the California Code of Regulations adding GHG emissions standards to California's existing standards for motor vehicle emissions.

EO-S-1-07 – Low Carbon Fuel Standard

EO-S-01-07 reduces the carbon intensity of California's transportation fuels by at least 10% by 2020. The Low Carbon Fuel Standard (LCFS) is a performance standard with flexible compliance mechanisms that incentivizes the development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions.

Heavy-Duty Vehicle GHG Emission Reduction (Aerodynamic Efficiency)

This regulation requires existing trucks/trailers to be retrofitted with the best available technology and/or ARB-approved technology to increase vehicle aerodynamics and fuel efficiency that will result in GHG reductions. This measure was identified as a Discrete Early Action in the Scoping Plan, which means it needed to be enforceable beginning in 2010. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. These requirements apply to both California-registered trucks and out-of-state registered trucks that travel to California.

REGIONAL PROGRAMS AND COORDINATION

In addition to the Scoping Plan and other actions taken at the statewide level, numerous county-wide and other regional efforts have also been established to support broad action towards emissions reductions within the San Diego Region. These programs are led by organizations that serve the greater San Diego region, such as the San Diego Association of Governments (SANDAG), the San Diego Gas & Electric Company (SDG&E), and the Center for Sustainable Energy (CSE), among others. The following program summaries provide a sample of efforts to promote emissions reductions and support broader community health goals within the region. Some of these programs are referenced within the local reduction measures presented in Chapter 3, where collaborative implementation opportunities have already been identified. Others may provide the funding or knowledge-sharing framework that will support future long-range emissions reduction efforts within La Mesa.

SANDAG 2050 Regional Transportation Plan and Sustainable Communities Strategy

The Regional Transportation Plan (RTP) is a comprehensive strategy for investing local, state, and federal transportation funds anticipated within the region through 2050. The largest portion of funds will go towards transit projects, followed by highway improvements (particularly the addition of high occupancy lanes), and local roads and streets. The percentage of funds dedicated to transit is expected to grow incrementally each decade, from the current 36% up to 57% in the plan's final decade. Pursuant to SB 375, the region's Sustainable Communities Strategy (SCS) was incorporated as an element of the RTP. The SCS details the region's plans to reduce GHG emissions to achieve adopted statewide targets established by ARB. The San Diego region's targets are to reduce per capita emissions from passenger cars and light trucks by 7% by 2020 and 13% by 2035 compared to 2005 levels. The SCS also demonstrates how regional land use and transportation planning can work in tandem to facilitate new development patterns that reduce emissions from passenger vehicles. The SANDAG Board of Directors adopted the RTP/SCS on October 28, 2011.

SANDAG Regional Climate Action Strategy

In 2010, this strategy was developed as the first-of-its-kind guidance document for local governments. The voluntary guide describes potential climate policies that SANDAG and local jurisdictions should consider in future updates to their long-range planning documents (e.g., RTP, General Plans). Potential regional policies include land use and transportation investments that reduce emissions from light-duty trucks and passenger vehicles, building energy efficiency improvements, and measures to reduce emissions from municipal operations. The Climate Action Strategy was approved by SANDAG's Board of Directors on March 26, 2010.

SANDAG Regional Energy Strategy

This strategy establishes goals for energy efficiency, renewable energy development, and energy infrastructure enhancements to meet the region's growing energy demand. The Regional Energy Strategy (RES) focuses on opportunities for member agencies to influence energy use through the areas of land use and transportation planning, funding, and the building entitlement process. The RES also assesses the regional need for additional energy resources and infrastructure. While this strategy does not replace regional energy provider's long-term planning efforts, it can inform their decision-making process. The SANDAG Board of Directors accepted the most recent Final RES Update on December 18, 2009. A summary report was prepared in 2014 to show regional progress in meeting each RES goal. In addition, the RES underwent a technical update in 2014 that extended its forecasts to 2050.

SANDAG Energy Roadmap Program

SANDAG provides local governments with energy management plans, or "Energy Roadmaps" that identify ways to save energy in municipal operations and community-wide, resulting in municipal cost savings and benefits to the environment. This program is a local government partnership with SDG&E, and each Roadmap is developed in consultation with City staff. Through energy audits, the program identifies potential energy savings, cost savings, and GHG reductions for municipal buildings and parks. The program was launched in July 2010, and is based on the Sustainable Region Program that SANDAG piloted from 2005 to 2009 with the cities of Carlsbad, Poway, and Solana Beach. Through the program, SANDAG offers assistance to cities to pursue energy saving opportunities at the community-wide and

municipal operations levels. Energy roadmaps have been initiated or completed for nearly all local governments within the region. SANDAG published the City of La Mesa Energy Roadmap in March 2013.

San Diego Regional Plug-In Electric Vehicle Readiness Plan

SANDAG partnered with the Center for Sustainable Energy (CSE) to develop a comprehensive plug-in electric vehicle (PEV) readiness plan for the San Diego region. The SANDAG Board of Directors accepted the plan in January 2014, which addresses barriers to PEV adoption through best practices, resources, and recommendation. In order to inform the development of the Readiness Plan, CSE published a report in December 2012 assessing levels of preparation for PEV deployment among jurisdictions in the region.

San Diego Regional Clean Cities Coalition

The San Diego Regional Clean Cities Coalition is a federally-funded Department of Energy program, coordinated locally by CSE, with a goal to reduce the use of petroleum in transportation. The coalition works with vehicle fleets, fuel providers, community leaders, and other stakeholders in both the public and private sectors on efforts to increase use of alternative fuel and alternative fuel vehicles, as well as encourages measures to reduce vehicle idling and improve fuel economy. The coalition also promotes emerging transportation technology and related infrastructure (e.g., ethanol, biodiesel, hydrogen). The coalition's efforts are conducted primarily through planning, education, and outreach activities. One of the coalition's primary programmatic goals is to displace 8 billion gallons of petroleum in the transportation sector by 2020. Through the Energy Roadmap Program described above, the San Diego Regional Clean Cities Coalition provided an alternative fuel assessment tailored to La Mesa's fleet and vehicle replacement protocols.

The San Diego Foundation

The San Diego Foundation provides education and support to the region's communities in implementing climate change planning efforts through research, strategic investments, and collaboration with community leaders and policymakers. The Foundation also provides tools and technical assistance to help local governments plan for future climate change. The Foundation has prepared several regional reports on climate change, including:

- Focus 2050 Study for the San Diego Region (2008),
- Regional Public Opinion Research on Climate Change (2010),
- Climate Action Planning Progress in the San Diego Region (2013), and
- San Diego, 2050 Is Calling. How Will We Answer? (2014).

LOCAL EFFORTS

The strategies presented in this CAP build from the commitment of La Mesa's residents, local businesses, and City government to take actions that will improve the community's quality of life, while also reducing La Mesa's greenhouse gas emissions.

Past actions include:

- completing various retrofit projects on municipal buildings, including replacing backup generators with more energy efficient units, replacing windows at the Community Center and Recreation Center, and updating office equipment with more energy-efficient options
- installing high-efficiency induction street lights (2011) and retrofitting all traffic signals with green and red light emitting diode (LED) lights (2003)
- retrofitting parking lot lighting with induction lamps that have digital timers for dusk-to-dawn control
- adopting a Sustainable Building Policy that evaluates the feasibility of integrating sustainable building techniques into all new buildings
- developing a mixed-use overlay zone that supports compact, urban development and pedestrian-oriented neighborhoods
- implementing a Bicycle Facilities and Alternative Transportation Plan to identify infrastructure and pedestrian environment enhancements, "Safe Routes to Transit," and opportunities for public education and outreach efforts on local bike routes and safe riding practices
- improving fuel efficiency and reducing air pollution in municipal fleet vehicles and installing AIMS Fuelmaster devices on all emergency vehicles to monitor fuel consumption and identify maintenance issues
- offering a backyard composting program allowing residents to purchase discounted bins
- increasing construction and demolition (C&D) debris diversion requirements to 75%, exceeding the state-required minimum of 50%, and requiring a C&D diversion deposit to encourage participation
- participating in (PACE) financing districts that offer residents and businesses financing options for qualifying energy- and water-conservation improvements, including CaliforniaFirst (adopted by City Council by Resolution No. 2010-022); HERO (adopted by City Council by Resolution No. 2014-047); Figtree (adopted by City Council by Resolution No. 2015-019); and Ygrene Works (adopted by City Council by Resolution in 2015).
- adopting a model water-efficient landscaping ordinance to reduce outdoor water use on City property through lawn removal projects and irrigation system upgrades

Scope and Content of the Climate Action Plan

CAPs can be developed to include various types and amounts of information, depending upon their planned purpose and local context. In general, most CAPs present local emissions levels and future estimates, establish a reduction target, and outline strategies to achieve that target. La Mesa's CAP largely follows this development approach with information presented in the following four chapters:

- **Chapter 1: Planning for Climate Change** provides an overview of the topics covered in the CAP. This chapter sets La Mesa's CAP within the context of statewide climate planning efforts and related regional initiatives, and presents a concise overview of conventional climate change science findings. The chapter also describes the climate action planning process and components typically found within a CAP. It also describes the relationship between the CAP and the California Environmental Quality Act (CEQA), including implementing the City's General Plan Environmental Impact Report (EIR) Mitigation Measure 4.5.5., GHG-1.
- **Chapter 2: Greenhouse Gas Emissions** presents the community-wide baseline inventory and horizon year 2020 forecasts to identify the sources of emissions within La Mesa. The chapter describes La Mesa's emissions reduction target and how it compares to future emissions levels, and describes the level of emissions reductions estimated to occur as a result of the ongoing statewide actions described in Chapter 1. The combination of future emissions levels, assumed statewide reductions, and the City's target results in the emissions reduction gap that will be addressed through local actions described in Chapter 3.
- **Chapter 3: Emissions Reduction Measures** introduces the CAP's local reduction measures organized into five reduction strategy areas: energy, land use and transportation, water, solid waste, and green infrastructure. The chapter presents the reduction measures by first describing the City's related past actions, then describes what new steps will be taken. Emissions reduction estimates related to implementation of these local measures are provided, where possible, to help demonstrate how the combination of local and statewide actions will allow the City to achieve its emissions reduction target.
- **Chapter 4: Benchmarks and Implementation** describes a process for monitoring the City's future progress towards emissions reduction target achievement. This chapter introduces the concept of regular inventory updates as a means to track overall progress, as well as measure-specific review to guide revisions to the City's implementation strategy.

Technical appendices A and B provide additional detail on topics covered within the plan.

- **Appendix A: Emissions Inventory and Forecast Methodology** provides a technical description of the methodology and data sources used to prepare the 2010 emissions inventory and the 2020 emissions forecasts.
- **Appendix B: Reduction Quantification Methodology** presents the assumptions and methodologies used to estimate the emissions reduction potential of the CAP measures.

Relationship to the California Environmental Quality Act

Local governments may prepare a Plan for Reduction of Greenhouse Gases that is consistent with AB 32 goals. The development of such a plan can be used for CEQA review of subsequent plans and projects that are consistent with the GHG reduction strategies and targets in the plan. This approach allows jurisdictions to address GHG emissions at a communitywide level to determine the most effective and efficient methods to reduce GHG emissions, identify the reduction measures that would be promote the goals of the General Plan, and employ the reduction measures that have the most co-benefits (for improving mobility and access, local economic development, reducing household and business utility and transportation costs, improving public health, etc.).

This CAP was developed to implement the City's General Plan. Specifically, the General Plan EIR includes Mitigation Measure 4.5.5., GHG-1, which calls for a CAP and identifies a 15% reduction target.

While the CAP was developed to implement the General Plan EIR mitigation measure, the City could use an assessment of consistency with this CAP in-lieu of project-specific GHG CEQA analysis to entitle projects. A project-specific environmental document that relies on this CAP for its cumulative impacts analysis would identify specific CAP measures applicable to the project and how the project incorporates the measures. If the measures are not otherwise binding and enforceable, they must be incorporated as mitigation measures, project conditions of approval, or some other mechanism to ensure implementation. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable, notwithstanding the project's compliance with specific measures in this CAP, an environmental impact report (EIR) must be prepared for the project.[i]

CHAPTER 2

Greenhouse Gas Emissions

Developing meaningful reduction measures and evaluating their ability to meet an emissions reduction target first requires an understanding of baseline and future year community-wide emissions levels. This chapter describes the sources and scale of emissions generated by activities within La Mesa and how they are estimated to grow by the year 2020. It also describes the City's emissions reduction target, and how the statewide actions described in Chapter 1 help to make progress toward that target. These steps provide the foundation for development of the locally-appropriate reduction measures described in Chapter 3 to address any remaining emissions reduction gap between the statewide actions and the City's target.

Baseline GHG Emissions Inventory

Establishing a baseline inventory is the first step in developing a CAP, and provides a snapshot of the amount and sources of GHG emissions within a community for a specific year. Baseline inventories can serve as a reference point to help determine an appropriate emissions reduction target, and indicate the types of measures to pursue in order to make meaningful progress towards that target. This section introduces La Mesa's emissions sources and resulting contributions to the 2010 baseline inventory.

It should be noted that the City previously prepared a 2005 emissions inventory. However, as part of this CAP development process, a new baseline inventory was prepared using community-wide activity data from 2010 and current industry practices in inventory preparation. The underlying methodologies used to prepare the two inventories were substantially different, such that direct comparisons cannot be made between the 2005 and 2010 inventories.

EMISSIONS SECTORS

The baseline inventory organizes emissions into categories, or sectors, based on the source of emissions. La Mesa's inventory includes emissions from five sectors, which are described further below:

- Energy (electricity and natural gas)
- Transportation
- Solid Waste
- Potable Water
- Wastewater

Energy

In general, energy emissions are generated through the combustion of fossil fuels to generate electricity or directly provide power (e.g., natural gas combustion for water heating). The energy sector includes the use of electricity and natural gas in residential, commercial, industrial, and government land uses within the jurisdictional boundaries of La Mesa. Although emissions associated with electricity production are likely to occur in a different jurisdiction, the emissions are considered to be measured at the point of use and not the point of generation (these are called indirect emissions). Consumers are therefore considered accountable for the generation of those emissions. Electricity-related GHG emissions are considered indirect emissions because they are generated as a result of activities occurring within the jurisdiction, even though the actual emissions occur in different geographic areas. For example, a La Mesa resident may consume electricity within the city, but that electricity is likely generated in a different part of the region or state. Direct emissions are those where the consumption activity directly generates the emissions, such as natural gas combustion for heating or cooling (when this activity occurs on site).

SDG&E provides electricity and natural gas service within La Mesa, and provided electricity and natural gas consumption data (i.e., kilowatt-hours (kWh) per year and therms per year) for the baseline year. This consumption data was then multiplied by energy emissions factors to determine the amount of GHG emissions resulting from energy consumption in La Mesa.

Transportation

The transportation sector estimates emissions for vehicle trips occurring within the community. Unlike most of the other sectors where activity data is available to more precisely calculate resource consumption (e.g., amount of electricity used, wastewater generated, or solid waste disposed), the transportation sector relies upon travel models to estimate vehicle use within a community. These models estimate the total vehicle miles traveled (VMT) within a community, which can then be combined with vehicle fuel emissions factors to estimate transportation-related emissions.

La Mesa's CAP is based on VMT data developed by SANDAG to ensure that emissions forecasts in the CAP align with growth envisioned in the City's General Plan and other regional planning efforts. The model provided VMT data separated by each trip's origin and destination. This allowed an analysis of the total VMT to determine the number of trips beginning *and* ending within the city, beginning *or* ending in the city, and those that just pass through the city (for example, non-local drivers on Interstate 8). The baseline inventory includes 100% of trips that begin *and* end in the city, 50% of trips that begin *or* end in the city, and 0% of trips that only pass through. Emission factors for this sector were obtained from the

ARB vehicle emissions model, EMFAC2011. EMFAC2011 is a mobile source emission model for California that provides vehicle emission factors by both county and vehicle class. San Diego County-specific emission factors were used to prepare this emissions inventory.

Solid Waste

Solid waste emissions are generated from the waste decomposition process, during which only organic (i.e., carbon-based) materials release GHGs. Carbon dioxide (CO_2) emissions are generated under aerobic conditions (i.e., in the presence of oxygen), such as when composting. Methane (CH_4) and CO_2 emissions, two common greenhouse gases, are generated under anaerobic conditions (i.e., in the absence of oxygen), as in many landfill environments. Waste collection and hauling activities also generate GHG exhaust emissions. However, hauling-related emissions are assumed to be included within commercial vehicle transportation models and represented within the transportation sector.

Solid waste generated within the city is primarily sent to the Otay Landfill in Chula Vista. Emissions in this sector were modeled using the U.S. Environmental Protection Agency's (EPA) Waste Reduction Model (WARM) and waste characterization estimates, with solid waste disposal data collected from CalRecycle's Disposal Reporting System.

Potable Water

The water sector includes energy emissions associated with water treatment, distribution, and conveyance. Emissions in this sector are based on estimates of total water consumption within the city, combined with energy emissions factors specific to each component of the potable water process (e.g., treatment, distribution). The California Energy Commissions' (CEC) water-energy intensity estimates were used to calculate total electricity required to provide the community's potable water.

Wastewater

The wastewater sector includes emissions resulting from the wastewater treatment process. The 2006 IPCC *Guidelines for National Greenhouse Gas Inventories* is commonly used to quantify methane and nitrous oxide (N_2O) emissions resulting from wastewater treatment processes. Generation of both types of emissions depend on the amount of annual throughput (i.e., volume of wastewater), as well as characteristics of the wastewater itself and treatment plant management processes. Energy-related GHG emissions associated with wastewater treatment facility operation are included within the energy sector.

La Mesa's wastewater emissions were estimated using energy intensity factors from the City of San Diego's Point Loma Wastewater Treatment Plant as a proxy for local information that was unavailable at the time of CAP preparation. The City provided La Mesa-specific wastewater flow data, which was combined with the energy intensity factors to calculate total emissions.

UNITS OF MEASUREMENT

Emissions inventories are commonly expressed in metric tons (or tonnes) of carbon dioxide equivalent per year (MT CO_2e/yr) to provide a standard measurement that incorporates the varying global warming potentials (GWP) of different greenhouse gases. GWP describes how much heat a greenhouse gas can trap in the atmosphere relative to carbon dioxide, which has a GWP of 1. For example, methane has a GWP of 25, which means that 1 metric ton of methane will trap 25 times more heat than 1 metric ton of carbon dioxide, making it a more potent greenhouse gas. Some gases used in industrial applications can

have a GWP thousands of times larger than that of carbon dioxide. See Table 2.1 for a sample of common greenhouse gases and their global warming potential.

Table 2.1
Greenhouse Gases and Global Warming Potential

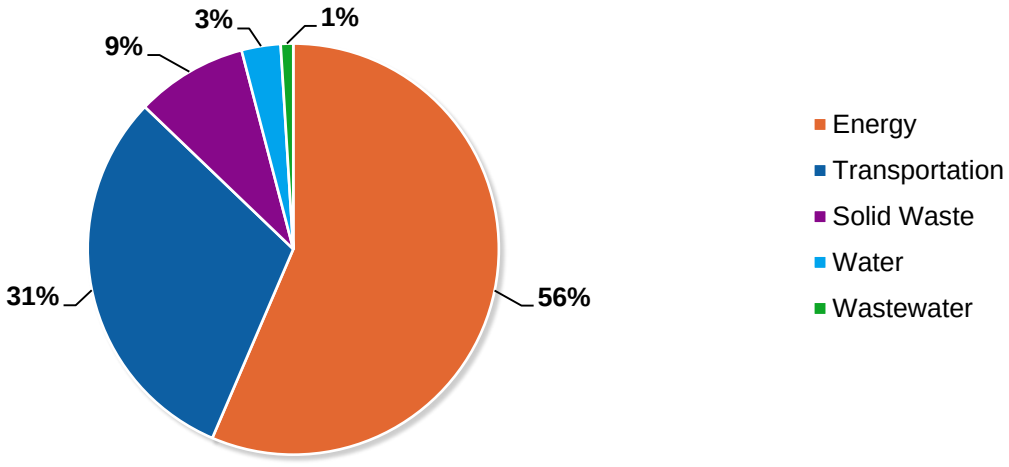
Common Name	Chemical Formula	Global Warming Potential (100-yr)
Carbon Dioxide	CO_2	1
Methane	CH_4	25
Nitrous Oxide	N_20	298
Tetrafluoromethane (PFC-14)	CF_4	7,390
Fluoroform (HFC-23)	CHF_3	14,800
Sulfur Hexafluoride	SF_6	22,800

Source: IPCC Fourth Assessment Report, Climate Change 2007[ii]

La Mesa's Baseline Inventory (2010)

La Mesa's baseline emissions inventory totals 248,073 MT CO_2e/yr in 2010. As shown in Figure 2.1, energy use is the largest contributor of GHG emissions in the City (56%), with transportation emissions contributing the majority of the remainder (31%). The energy and transportation sectors account for approximately 87% of total emissions, suggesting that local reduction efforts should focus on these areas. Solid waste emissions provide 9% of the inventory. Potable water and wastewater are both small contributors by comparison, making up the remaining 4% of the inventory. See Table 2.2 for total emissions from each sector.

Figure 2.1 – 2010 Baseline Emissions by Sector



Source: EPIC 2014, AECOM 2015

Table 2.2 2010 Community-wide Emissions			
Emission Sector	**Subsector**	**Emissions (MT CO_2e/yr)**	**Communitywide Total (%)**
Energy		**140,028**	**56.4%**
Electricity Subtotal		*90,610*	*36.5%*
	Residential	41,621	16.8%
	Commercial	48,989	19.7%
Natural Gas Subtotal		*49,418*	*19.9%*
	Residential	36,368	13.9%
	Commercial	13,050	5.0%
Transportation		**76,192**	**30.7%**
Solid Waste		**21,799**	**8.8%**
Potable Water	Water Supply Demand	**7,613**	**3.1%**
Wastewater	Wastewater Treatment	**2,441**	**1.0%**
Total		**248,073**	**100.0%**

Source: EPIC 2014, AECOM 2015
Note: MT CO_2e = metric tons of carbon dioxide equivalent

For context, San Diego County's 2010 emissions inventory was estimated to be 32 million MT CO_2e, or 10 MT CO_2e per capita compared to approximately 4.3 MT CO_2e per capita in 2010 in La Mesa.[iii]

Business-as-Usual Emissions Forecast (2020)

The baseline inventory was used to project community-wide emissions in 2020 under a business-as-usual (BAU) scenario. La Mesa's GHG emissions were forecast to a 2020 horizon year under a scenario that assumes historic trends in energy and water consumption, travel, and solid waste generation remain constant from a per-service population (i.e., population plus employment) perspective. Therefore, BAU forecasts demonstrate what emissions levels are likely to be if no additional statewide or local actions are taken to curtail emissions growth (beyond those actions already in place in the baseline year).

BAU emissions forecasts provide insight regarding the scale of reductions necessary to achieve the City's emissions target before considering reductions likely to result from implementation of statewide and local actions, technological advancements (e.g., improved energy-efficiency in appliances), or other conservation factors. The BAU forecast also does not consider potential emissions growth that could occur from increased consumption in existing or new sectors (e.g., increased plug-load from smartphones or other electronic devices).

The only variable influencing the BAU forecast is projected population and employment growth within the City, which were based on buildout assumptions from the City's General Plan land use diagram. This forecast was developed for planning purposes only, and due to the complexity of each emissions sector and the uncertainty of future population and employment growth within the City, is subject to change.

Therefore, the City should prepare a 2020 inventory update to compare against the CAP's BAU forecast emissions levels, in order to verify target achievement. If the City develops longer-term reduction targets in the future, regular emissions inventory updates will also help to assess interim progress and identify opportunities for CAP strategy revisions.

Table 2.3 shows La Mesa's community-wide emissions by sector in 2010 and 2020 based on the BAU growth scenario. Emissions are forecast to increase by 20,591 MT CO_2e/yr (8.3%) between 2010 and 2020.

Table 2.3
Community-wide BAU Emissions (2010 and 2020)

Emission Sector	2010 Emissions (MT CO_2e/yr)	2020 Emissions (MT CO_2e/yr)	Increase from 2010 (%)
Energy	**140,028**	**149,461**	**6.7%**
Electricity Subtotal	*90,610*	*96,714*	*6.7%*
Residential	41,621	44,425	6.7%
Commercial	48,989	52,289	6.7%
Natural Gas Subtotal	*49,418*	*52,747*	*6.7%*
Residential	36,368	38,818	6.7%
Commercial	13,050	13,929	6.7%
Transportation	**76,192**	**85,205**	**11.8%**
Solid Waste	**21,799**	**23,267**	**6.7%**
Potable Water	**7,613**	**8,126**	**6.7%**
Wastewater	**2,441**	**2,605**	**6.7%**
Total	**248,073**	**268,664**	**8.3%**

Source: EPIC 2015; AECOM 2015
Note: MT CO_2e = metric tons of carbon dioxide equivalent

Adjusted GHG Emissions Forecast (2020)

As discussed in Chapter 1, the State of California adopted and implemented a number of policies and programs aimed at reducing statewide GHG emissions, to help achieve its emissions reduction targets. Most of La Mesa's emission reductions are estimated to come from these statewide actions. When the impact of these statewide actions is applied to La Mesa's BAU emissions forecast, the resulting adjusted business-as-usual (ABAU) emissions levels begin to show progress towards La Mesa's 2020 target, and serve to reduce the total amount of emissions to be addressed through local actions.

The City will monitor the effectiveness of state legislation to ensure that the anticipated level of reductions is achieved locally, and to ensure that all applicable statewide reductions are included in future CAP updates. Review of statewide action implementation progress should occur concurrently with future community-wide emissions inventory updates. This CAP considers locally-realized emissions reductions from the following state actions:

- Renewable Portfolio Standard,
- AB 1109 – Lighting Efficiency,
- AB 1493 – Pavley I and II,
- EO-S-1-07 – Low Carbon Fuel Standard, and
- Heavy-Duty Vehicle Aerodynamic Efficiency Regulations

Including only these statewide initiatives towards the GHG reduction targets is considered a conservative approach because the AB 32 Scoping Plan describes numerous other actions that are estimated to result in statewide emissions reductions. The actions included in this CAP represent those for which a methodology is available to calculate La Mesa's likely share of these reductions. Other actions will provide statewide benefits, but cannot be accurately attributed to La Mesa at this time.

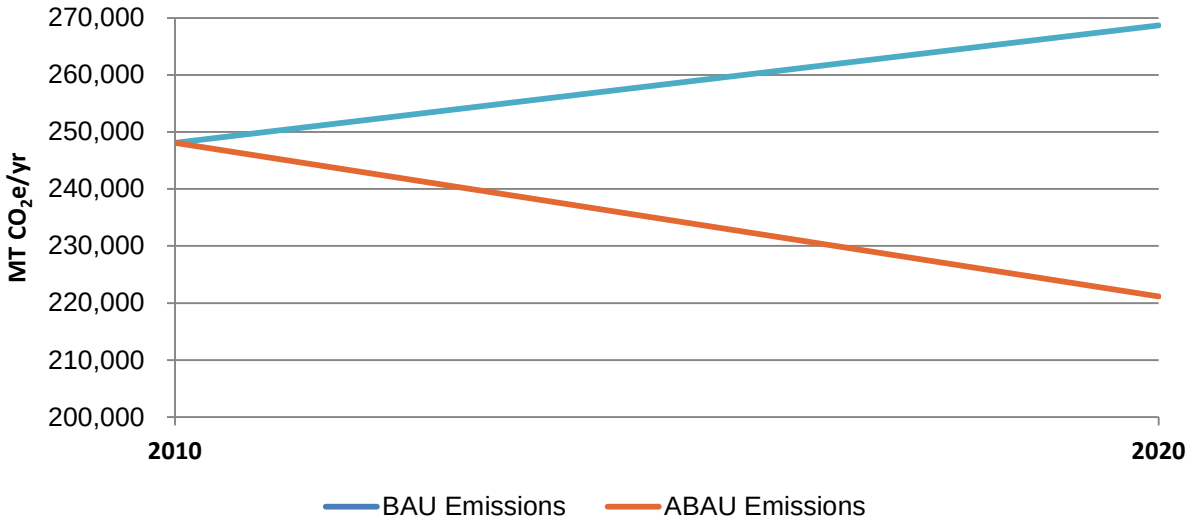
Table 2.4 summarizes the anticipated reductions associated with these statewide actions in year 2020. Figure 2.2 shows the trajectory of the BAU and ABAU emissions forecasts from baseline year 2010 through 2020.

Table 2.4
2020 Emission Reductions from Statewide Actions

Statewide Action	2020 Reduction (MT CO_2e/yr)
Renewable Portfolio Standard (33% by 2020)	18,775
AB 1109 – Lighting Efficiency	7,330
Pavley I and II and Low Carbon Fuel Standard	21,270
Heavy-Duty Vehicle Aerodynamic Efficiency Regulations	130
Total	**47,505**

Source: AECOM 2015
Note: MT CO_2e = metric tons of carbon dioxide equivalent

Figure 2.2 – BAU and ABAU Emissions Forecasts



Emissions Reduction Target

Following preparation of an emissions inventory and forecasts, the next essential step in the CAP development process is to establish a reduction target. A CAP's primary goal is to reduce GHG emissions, and the reduction target serves as an aspirational metric to help focus local actions to achieve that end. Establishing a clear and attainable target can also motivate staff and community members, help guide long-term strategies, and increase transparency and accountability regarding the CAP's objectives. In the case of La Mesa, the reduction target was also selected to implement the City's General Plan EIR Mitigation Measure 4.5.5., GHG-1 (which calls for a CAP and a 15% reduction target).

La Mesa has already adopted an emissions reduction target as part of its General Plan, which directs the City to reduce community-wide emissions by 15% below 2005 levels by the year 2020. The City's previously prepared 2005 emissions inventory was prepared using data and methodologies that are incompatible with those used to prepare the 2010 emissions inventory presented in this CAP, and therefore prevent direct comparison between the two inventories. However, the intent in selecting the existing target was to conform to the guidance available at that time from ARB and OPR. This section introduces important guidance that many other jurisdictions consider when selecting an appropriate reduction target. The rationale underlying this guidance is consistent with the City's previous target, and can be used to revise the City's original target to reflect a 2010 baseline emissions inventory.

State Legislation and Guidance

Executive Order S-3-05 identified California's vulnerability to the impacts of GHG emissions, and established a long-range GHG reduction target of 80% below 1990 levels by 2050. Subsequently, AB 32, the California Global Warming Solutions Act of 2006 was signed, which includes an interim reduction target, requiring California to reduce *statewide* GHG emissions to 1990 levels by 2020.

AB 32 also directed ARB to develop and implement regulations that reduce statewide GHG emissions. ARB approved *The Climate Change Scoping Plan* (Scoping Plan) in December 2008, which outlines the

state's plan to achieve the GHG reductions required in AB 32. The Scoping Plan does not define the specific role local governments, like the City of La Mesa, will play in meeting the state's GHG reduction goals, but does identify cities and counties as "essential partners" within the overall statewide effort.

As such, many cities and counties began to assess local GHG contributions and develop community-focused Climate Action Plans. However, many local governments do not have sufficient historical data available to prepare a 1990 baseline emissions inventory, which would allow local governments to establish reduction targets that exactly mimic the state's own targets. In the Scoping Plan, ARB "encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the state commitment to reduce greenhouse gas emissions by approximately 15% from current levels by 2020."[iv]

Based on this language, many cities preparing community-wide CAPs have selected a reduction target of at least 15% below baseline levels by 2020 to parallel the state's target. Increasingly, jurisdictions are also establishing a longer-term target to show a trajectory towards the state's 2050 goal of 80% below 1990 levels.

CEQA Guidelines

The City of La Mesa has developed this CAP to implement General Plan EIR Mitigation Measure 4.5.5., GHG-1, which commits the City to preparation of a CAP with a 15% reduction target.

This CAP was also developed consistent with state guidelines that pertain to local plans "for the reduction or mitigation of GHG emissions" (pursuant to SB 97 and state CEQA Guidelines Section 15183.5). Many jurisdictions use an assessment of consistency with a CAP instead of individual, project-level greenhouse gas analysis in CEQA documents. La Mesa's CAP meets the framework set forth in the CEQA Guidelines so that the City can rely on the GHG analysis and application of GHG reduction measures in the CAP to satisfy the requirements of CEQA. State CEQA Guidelines Section 15183.5 establishes the criteria for GHG reduction plans. In general, GHG reduction plans should:

- Quantify GHG emissions within a defined area,
- Establish a level where GHG emissions are not cumulatively considerable,
- Identify emissions from activities covered by the plan,
- Specify measures to achieve the emissions reduction goal,
- Monitor progress and amend if necessary, and
- Be adopted in a public process following environmental review.

Section 15183.5(b)(1)(B) specifically requires that a GHG reduction target must "Establish a level, below which the contribution to [GHG] emissions from activities covered by the plan would not be cumulatively considerable." To comply with this provision within the guidelines, a reduction target must be based on substantial evidence.

San Diego County Guidance

In 2013, the County of San Diego adopted Guidelines for Determining Significance for Climate Change. The foundation of the document is regional data, inclusive of San Diego County, as well as the unincorporated area. Although created for use by the County, the document offers an approach that may

be used by other lead agencies in the San Diego region, which have substantial discretion in analytical approaches and assessing significance under CEQA.

The document presents substantial evidence for three community-wide emissions reduction targets: (1) 1990 levels by 2020, (2) 16% below current (2013 or earlier) levels by 2020, or (3) use of an efficiency threshold of 4.32 MT CO_2e/yr per service population (i.e., residents plus employees) by 2020.

These guidelines provide the substantial evidence necessary to establish a level where GHG emissions are not cumulatively considerable, as outlined in the CEQA guidelines describe above. The targets were also designed to mirror the statewide emissions targets for use at the local level.

LA MESA'S EMISSIONS REDUCTION TARGET

In lieu of more current and specific guidance from OPR, ARB, or the San Diego Air Pollution Control District (SDAPCD) at the time of document preparation, La Mesa has opted to rely on San Diego County's guidance in selecting the following target:

- **16% below baseline (i.e., 2010) levels by 2020**

This target is consistent with the intent of the City's original target (i.e., mirror statewide emissions reduction efforts), is directly applicable to the CAP's 2010 baseline year, and is based on the most current guidance regarding local target selection. Table 2.5 summarizes the emissions reduction targets, contributions from statewide actions, and the remaining emissions reduction gaps to be addressed through implementation of local actions at the community-wide level. Based on the 2010 emissions inventory and 2020 forecasts presented in this chapter, the 2020 community-wide emissions reduction target is 208,381 MT CO_2e/yr (i.e., 16% below 2010 emissions levels). Reductions totaling 60,283 MT CO_2e/yr in 2020 would be required to achieve this target. The 2020 statewide reductions identified in Table 2.4 would contribute emissions reductions of 47,505 MT CO_2e/yr. The remaining gap of 12,778 MT CO_2e/yr must be addressed through development and implementation of the local actions described in Chapter 3.

Table 2.5
2020 Emissions Reduction Target

	2010 (MT CO_2e/yr)	2020 (MT CO_2e/yr)
BAU Inventory and Projections	248,073	268,664
Reduction Target (16% below 2010 levels)	-	208,381
Reductions Needed to Achieve Target	-	60,283
Assumed Statewide Reductions	-	47,505
Local Action Reductions Needed to Achieve Target		**12,778**

Source: AECOM 2015

Note: MT CO_2e = metric tons of carbon dioxide equivalent
Refer also to Figure 3.1, which illustrates the projected reductions available with implementation of statewide and local actions.

CHAPTER 3

Emissions Reduction Measures

This chapter presents emission reduction strategies, including goals, measures, and action steps, that La Mesa City staff and community members could implement to reduce community-wide GHG emissions and achieve the City's 2020 reduction target. To better ensure proper implementation, each measure includes a brief description, development background information, and lists necessary actions, as well as anticipated reductions from implementation of the measure.

The measures identified in this chapter address issues within the City's direct influence, and have primarily been selected to influence emissions reductions within the community. The City will evaluate effectiveness of CAP measures and actions on an on-going basis and propose program modifications if necessary, to achieve reduction targets. The following sections describe the structure and components of the six reduction strategy areas: energy, transportation and land use, water, solid waste, green infrastructure, and CAP implementation.

Reduction Strategies

Each strategy area comprises a collection of reduction measures related to a certain emissions source area or topic. These strategies represent the primary avenues by which to reduce community-wide GHG emissions in La Mesa. As described in Chapter 1, this document focuses on achievement of the City's 2020 emissions target. While the City does not currently have a longer-term reduction target, many of the strategies presented in this chapter would contribute to continued reductions beyond 2020. If the City decides to establish longer-term targets in the future, additional reduction strategies may also be developed to help achieve those new targets.

The emission reduction strategies are as follows:

- **Energy Strategy:** recommends ways to increase energy efficiency in existing buildings and outdoor lighting, as well as increase use of renewable energy sources community-wide.
- **Transportation and Land Use Strategy:** encourages greater use of multi-modal transportation options, including walking, biking, and transit through land use design, infrastructure development, and demand management programs. This strategy also lays the foundation for future transitions toward alternative fueled vehicles.
- **Water Strategy:** promotes the efficient use of water in buildings and landscapes.
- **Solid Waste Strategy:** increases diversion of waste materials that can be composted, recycled, or otherwise beneficially reused.
- **Green Infrastructure Strategy:** presents a strategy to enhance long-term management and health of the City's existing urban forest.
- **CAP Implementation Strategy:** provides a broad framework to support regional coordination on CAP implementation to ensure estimated reductions occur while leveraging ongoing partnerships and actions among neighboring jurisdictions.

Each strategy area section in this chapter begins with an introduction linking it to emissions generation and reduction opportunities. The introductory overview is then followed by the specific measures and actions to guide implementation of the CAP's programs.

Reduction Measures

The measures presented under each strategy in this chapter were developed by (a) evaluating existing community conditions, (b) identifying emission reduction opportunities within the community, (c) including best practices from other jurisdictions and organizations, and (d) incorporating state and regional laws, guidelines, and recommendations. Table 3.1 summarizes the measures developed for the City of La Mesa and the emissions reductions anticipated from their implementation, as described later in this chapter. Total emissions reductions, including those from statewide actions presented earlier in the CAP, are compared to the City's reduction target to show how implementation of this CAP will allow the City to achieve its 2020 emissions target.

Some measures in Table 3.1 do not include numeric reduction estimates, but are identified as "Supporting." These measures cannot be accurately quantified at this time for several reasons, including:

- supporting data or quantification methodology are not currently available (e.g., unknown electricity consumption from parking lot lighting to accurately estimate reductions from retrofits),
- emissions reductions have been included within the estimate of another measure and cannot be calculated separately (e.g., bicycle safety programs and supporting infrastructure are both important to increase ridership),
- reduction potential is already captured within the BAU emissions forecast (i.e., VMT reductions associated with mixed-use development are built into the 2020 emissions forecast), and

- measures present long-term reduction strategies, but are unlikely to be meaningfully implemented by the 2020 horizon year (e.g., low natural gas prices and high solar hot water heater system costs limit broad adoption solar heating technology, despite existing utility rebate programs).

Though not quantified at this time, supporting measures are presented in this CAP because they broadly contribute to achievement of the City's reduction target and help lay the foundation for even greater emissions reductions over the long-term.

Table 3.1
Summary of Measures and Quantified Reductions

Reduction Strategies and Measures			2020 (MT CO_2e/yr)
ENERGY STRATEGY			
E-1	Building Retrofit Outreach		10,475
E-2	Shade Tree Outreach		5
E-3	Municipal Energy Efficiency Goal		40
E-4	Public Lighting		200
E-5	Parking Lot Lighting		Supporting
E-6	Solar Photovoltaic Outreach		2,725
E-7	Solar Hot Water Outreach		Supporting
E-8	Solar Ready Construction		Supporting
		Energy Subtotal	***13,445***
TRANSPORTATION AND LAND USE STRATEGY			
T-1	Bicycle and Pedestrian Infrastructure Development		50
T-2	Bicycle Safety Outreach		Supporting
T-3	Transportation Demand Management Program		Supporting
T-4	Mixed-Use and Transit-Oriented Development		Supporting
T-5	Alternative Refueling Infrastructure Development		Supporting
T-6	Municipal Fleet Transition		5
		Transportation Subtotal	***55***
WATER STRATEGY			
W-1	Urban Water Management Plan Programs		1,330
W-2	Water Sensitive Landscape Design		Supporting
		Water Subtotal	***1,330***
SOLID WASTE STRATEGY			
SW-1	Food Scrap and Yard Waste Diversion		250
SW-2	Construction and Demolition Waste Diversion		275
		Solid Waste Subtotal	***525***

Table 3.1
Summary of Measures and Quantified Reductions

Reduction Strategies and Measures		2020 (MT CO_2e/yr)
GREEN INFRASTRUCTURE STRATEGY		
G-1	Urban Forest Management	45
	Green Infrastructure Subtotal	***45***
IMPLEMENTATION STRATEGY		
I-1	Regional Implementation Partnerships	Supporting
I-2	CAP Implementation and Monitoring	Supporting
	Implementation Subtotal	**-**
TOTAL REDUCTIONS		
Statewide Reductions Subtotal		47,505
Community-wide CAP Measures Subtotal		15,400
	Total	***62,905***
TARGET ACHIEVEMENT		
Reduction Target		16% below baseline
Reductions Needed		60,283
Reductions Estimated		62,905
Estimated Achievement Level below Baseline		**17.1%**

Source: AECOM 2015
Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure Structure

CAP measures describe the programs, policies, projects, and other actions the City will carry out to accomplish its emissions reduction goals, including reductions attributed to past actions that occurred since the 2010 baseline year. Each measure presented in this chapter describes its relationship to local emissions reduction opportunities, related actions previously taken by the City or community members, and future actions that the City will lead during the CAP implementation process. These narrative descriptions are followed by measure implementation tables that summarize the actions to be taken, departments responsible during implementation, a recommended timeframe to guide implementation prioritization, and progress indicators to help gauge future achievement of measure objectives. The following summaries describe these measure components in more detail.

MEASURE BOX

Each new measure can be identified by a gray rectangular box that includes the measure number and title, measure statement, and emissions reduction potential.

Measure Number and Title

The measure numbers and titles are provided for easy reference and match those shown in Table 3.1 above. The numbers and titles are color coded to indicate the measure's overarching strategy area:

- **Energy**
- **Transportation and Land Use**
- **Water**
- **Solid Waste**
- **Green Infrastructure**
- **Implementation**

Measure Statement

The measure statement is a one to two sentence description of the action to be taken. The statements expand upon the concept indicated in the measure title, but are not as detailed as the action steps presented later.

GHG Reduction Potential

Annual emissions reduction estimates from measure implementation are provided, where possible. As described above, measures identified as "Supporting Measure" contribute to implementation of other measures, and may provide additional emissions reductions that cannot be accurately quantified at this time. Including these measures within the CAP allows the City to begin implementing those actions that require a longer time horizon before producing emissions reductions (e.g., installing alternative fuel vehicle infrastructure within the community). Other supporting measures are included to put certain strategies on the City's radar for future planning purposes, such as Measures E-3 Municipal Energy Efficiency Goal and T-6 Municipal Fleet Transition. These measures may require additional research and analysis before full implementation can begin, and the sooner this planning occurs the sooner emissions reductions can be realized.

MEASURE DESCRIPTIONS

A narrative text provides details about how the measure can reduce emissions, past City and community efforts related to measure implementation, potential sources for funding and additional technical support, and future actions to be taken. Some descriptions provide guidance that can be used in program implementation, such as components of an outreach plan or which segments of the community should be targeted for participation.

IMPLEMENTATION TABLES

The tables following the measure descriptions summarize the actions to be taken, designate responsibility among City departments, indicate an implementation timeline, and provide progress indicators to track implementation success.

Actions and Responsibility

Actions identify specific steps that the City and its partners will take to implement each measure in order to realize the emissions reduction estimates. The tables also identify the City departments that are best positioned to lead or provide input for implementation of certain tasks.

Timeline

The timeline column indicates when each action should occur using the following four timeframes, and can be used to help prioritize the City's actions over the next five years:

- **On-going** items are actions the City is already performing or programs the City is already offering that will continue into the future.
- **Near-term** items are those actions that should be pursued immediately, within a 1-2 year timeframe, following CAP adoption.
- **Medium-term** items are actions that will help to achieve the 2020 reduction target, and should be pursued within 3-5 years, following CAP adoption.
- **Long-term** items are actions that will help provide broader measure implementation, but are not critical for near-term reduction target success; these items include actions that can be started now and will take 5 or more years to complete, or can wait to be considered for implementation in 5+ years.

Progress Indicators

Progress indicators describe the specific action that is being quantified to estimate the reduction potential. These indicators enable City staff, the City Council, and the public to track implementation and monitor overall CAP progress. Progress indicators are provided for the 2020 target year, and are specifically described when possible (e.g., 1 million kWh/yr saved from building energy retrofits). Progress indicators are not provided for supporting measures, which do not have quantifiable emissions reductions. Actual tracking of progress indicators will require the City to establish or enhance data collection practices, and build information-sharing relationships with various agencies and organizations.

Energy Strategy

As presented in Chapter 2, the consumption of electricity for appliances, lighting, and cooling, and combustion of natural gas for heating, cooking, and other processes within residential, commercial, and industrial buildings generated more than half of La Mesa's community-wide GHG emissions in 2010. These emissions can be reduced by improving energy efficiency in new and existing buildings and increasing the amount of electricity and heat generated from renewable energy sources.

In La Mesa, approximately 80%[v] of the housing stock was built before California's energy code, Title 24 Part 6, was first adopted in 1978. Consequently, the building stock offers considerable opportunity for cost-effective energy efficiency retrofits to decrease the use of both electricity and natural gas. The City plans to achieve energy efficiency improvements in both existing and new buildings and lighting through a combination of new community-wide voluntary programs, continuation or enhancement of existing efforts, and additional public outreach and education. In the *2007 Integrated Energy Policy Report*, the CEC adopted a goal to achieve net zero energy buildings in new residential construction by 2020 and non-residential construction by 2030. A net zero energy building consumes only as much energy on an annual basis as can be generated with an on-site renewable energy system (e.g., solar, wind, geothermal). While the pathway to realize this goal has not yet been defined at the statewide level, CSE produced a ZNE Roadmap for the San Diego region in 2014, which could help to realize long-term emissions reductions through new construction.

SDG&E is the natural gas and electricity provider for residential, commercial, industrial, and municipal users in La Mesa. SDG&E provides electricity that is generated from a variety of sources, including natural gas, coal, and renewables (e.g., wind, solar). As of 2014, RPS-compliant renewable energy facilities and contracts provided 24% of the electricity delivered to the utility's customers.[vi] As SDG&E continues to comply with the provisions of the RPS mandate, it will expand its renewable electricity portfolio, making additional emissions-free electricity available to customers within La Mesa. The City will also continue to encourage community-wide installation of rooftop solar photovoltaic (PV) and solar hot water systems to increase the portion of La Mesa's energy portfolio provided from renewable sources.

The total emissions reduction potential of the Energy Strategy is estimated to be 13,405 MT CO_2e/yr in 2020. This represents approximately 87% of total 2020 reductions anticipated from local CAP measure implementation. This high reduction amount is largely driven by strong past participation in utility-sponsored building retrofit programs and community-wide solar PV installations, both of which are expected to continue into the future. Many energy measures can also be implemented quickly with immediate effect as compared to other measures that might require infrastructure construction or long-term market transformations.

E-1
BUILDING RETROFIT OUTREACH

Encourage voluntary energy efficiency retrofits in residential and non-residential buildings through promotion of utility programs, PACE financing options, and local success stories.

2020 GHG Reduction Potential: **10,475 MT CO_2e/yr**

Building retrofit improvements can reduce electricity and natural gas use in existing buildings by incorporating energy-efficient appliances and lighting, improving building system operating efficiency (e.g., HVAC tune-ups), and decreasing heating and cooling needs through improvements to the building's thermal envelope. Various financial incentives and educational platforms exist to help building owners identify low-cost, high-return improvements. For example, the Center for Sustainable Energy and Energy Upgrade California offer online platforms with access to incentives, technical assistance, and qualified contractors. SDG&E also offers rebates and other financial incentives for the installation of energy-saving retrofits.

SDG&E has identified that approximately 17.9 million kilowatt hours (kWh) and 150,000 therms have been conserved in La Mesa since 2010 through utility-sponsored efficiency programs. This represents a 6% reduction below baseline electricity consumption and 1.6% reduction below baseline natural gas consumption. Continuation of SDG&E's programs at the same rate experienced from 2010 through 2014 could yield total savings of 35.5 million kWh and more than 300,000 therms. This would represent electricity consumption that is 9% lower than estimated under the BAU emissions scenario presented in Chapter 2. Similarly, natural gas consumption could be more than 3% lower than forecast in the BAU scenario. These assumptions depend upon the continuation of utility programs that offer community members energy saving opportunities and incentives to drive additional voluntary participation.

To further support broad community-wide energy conservation efforts, the City opted into the HERO and Figtree property assessed clean energy (PACE) programs to provide additional financing sources to its businesses and residents for qualifying retrofit and renewable energy projects. PACE programs were first enabled through AB 811 legislation. This bill allows land-secured loans for homeowners and businesses who install energy efficiency projects and clean-energy generation systems. Senate Bill 555 reinforced implementation opportunities for PACE programs by expanding the scope of activities allowed within a community facilities district, as defined by the Mello-Roos Community Facilities Act of 1982. A PACE program permits property owners within participating districts to finance the installation of energy- and water-efficiency improvements in their home or business through a lien against their property that is repaid through their property tax bill. If the property is sold, payment responsibility transfers to the new owners, allowing building owners to avoid up-front installation costs while at the same time requiring little or no investment of local government general funds. In some instances, the new lender may require repayment of the existing lien, in which case the remaining PACE loan is repaid from the proceeds of the property sale.

In addition to retrofits at the community level, the City has also taken a leadership position through pursuit of retrofit projects in municipal buildings and facilities (see Measure E-3 for additional discussion of municipal efficiency opportunities), including:

- Replacing backup generators at Fire and Police facilities with cleaner, more efficient units,
- Replacing windows and doors at the Community Center and Recreation Center with energy efficient options,
- Installing "Vending Miser" systems on machines at City facilities to reduce energy use during evenings and weekends, and
- Updating office equipment/appliances with more energy-efficient options (including ENERGY STAR models, where possible).

The City will facilitate further community-wide participation in retrofit activities through working partnerships with SDG&E, PACE financing providers, the Chamber of Commerce, and other community organizations. While some links to rebate and/or program information are already provided on the Sustain La Mesa webpage, the site could be reorganized for ease of use to highlight financial incentives, rebates, and financing providers, and share local examples of cost-saving retrofit projects for various building types (e.g., single family homes, rental apartment buildings, retail spaces, offices). The City will also continue working with the Center for Sustainable Energy (CSE) to host home energy upgrade workshops for community members.

	Action	Responsibility	Timeline
A	Continue to partner with CSE in hosting home energy upgrade workshops for community members; work with SDG&E to augment workshop information with examples of local case studies demonstrating actual energy/utility cost savings, simple payback calculations, challenges faced, and lessons learned		Medium-term
B	Work with SDG&E to identify high-priority (or hard-to-reach) neighborhoods for focused home energy retrofit outreach (e.g., neighborhoods with low levels of past participation in utility rebate programs, neighborhoods with higher energy use identified through heat-mapping, neighborhoods with older building stock); develop outreach program that identifies quick-payback or high impact retrofit projects that would be suitable in these neighborhoods; include projects supported by current rebate and incentive programs and home energy audits		Near-term
C	Work with existing PACE financing providers to increase awareness among residents and businesses; depending upon PACE providers' outreach approach and platform, work with local PACE financing participants to include success stories and case studies on Sustain La Mesa webpage		Near-term
D	Develop working partnership with SDG&E and PACE providers that encourages information sharing on number and type of retrofit installations performed annually community-wide; establish reporting and tracking procedure, as part of CAP implementation process, to collect new retrofit project data and estimate related energy savings; analyze retrofit data with SDG&E to identify focus areas for increased outreach, either programmatically (e.g., low community participation in outdoor lighting retrofits) or geographically (e.g., neighborhood "x" has low participation in utility-sponsored programs)		Long-term

	Action	Responsibility	Timeline
E	Partner with Campesinos Unidos and other organizations that provide assistance to low-income and elderly households to develop targeted outreach program that promotes federal and state weatherization programs, including development of education materials that highlight benefits of improved occupant comfort and reduced utility bills; provide information (including program links) about available low-income weatherization programs on Sustain La Mesa webpage and identify other outreach methods to increase visibility and familiarity with these programs		Medium-term

Progress Indicators	Year
35.5 million kWh/yr saved community-wide through retrofit programs since 2010; 305,000 therms saved community-wide through retrofit programs since 2010	2020

E-2
SHADE TREE OUTREACH

Develop a shade tree outreach campaign to encourage developers and property owners to voluntarily plant shade trees.

2020 GHG Reduction Potential: **5 MT CO_2e/yr**

Properly located trees can provide shading for residential and commercial buildings, and thereby reduce the need for air conditioning. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Large, deciduous species are ideal for reducing building energy use as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass in their trunks and roots as they absorb carbon from the air to grow.

The City broadly supports increasing greenery within the community and has been recognized as a Tree City, USA since 1980. The City is also participating in the San Diego County Tree Inventory program, which provides interactive maps to quantify the ecological and economic benefits of trees. The City can expand upon these efforts by encouraging property owners to select and plant appropriate shade tree species that can result in reduced energy use.

While this measure would only provide minimal emissions reductions in the near-term, those estimates would increase in the future as the trees are given more time to grow and provide increased levels of building shade. Trees also provide myriad benefits beyond emissions reductions, which make this an

attractive measure to pursue. Mature trees provide privacy, wildlife habitat, and stormwater management services, and can increase sentiments of community pride and property values.

Some communities have adopted landscaping ordinances that require installation of shade trees in new construction. However, because La Mesa is a largely built-out community, an implementation approach that targets only new construction would see limited success. Instead, the City will focus on encouraging voluntary shade tree plantings within the community through collaboration with neighborhood organizations, SDG&E, and other interested partners.

Opportunities may also exist through the San Diego County Tree Inventory program to develop regional promotional materials and outreach strategies to assist property owners with species selection and planting advice. Additionally, the Public Works Department could provide advice on planting strategies to avoid future root damage to sidewalks, driveways, and underground utilities.

Action		Responsibility	Timeline
A	Collaborate with CSE and SDG&E in developing shade tree give-away program or other incentives to encourage voluntary planting of shade trees for existing homes / buildings		Long-term
B	Work with local environmental / conservation groups and community organizations to encourage voluntary shade tree planting at existing homes and businesses; identify regional partners, including other participants in San Diego County Tree Inventory program, to collaborate on development of outreach campaign to highlight benefits of shade trees and provide planting technical guidance		Long-term
C	Collect and share related informational materials on Sustain La Mesa webpage, such as shade tree planting guides and current tree giveaways or rebates; provide informational materials to residents during building permit process (for new construction or major renovations)		Long-term
D	Consider adopting an existing tree protection ordinance that requires replacement of street trees that are removed, using list of pre-approved trees species		Long-term

Progress Indicators	Year
250 new shade trees planted in the community since 2015	2020

E-3
MUNICIPAL ENERGY EFFICIENCY GOAL

Establish an energy-efficiency goal for municipal buildings and facilities that can be achieved through system retrofits and increased employee conservation education.

2020 GHG Reduction Potential: **40 MT CO_2e/yr**

Municipal emissions are a small subset within community-wide emissions. Energy efficiency projects at City facilities will therefore provide community-wide reductions, while also saving taxpayer dollars through reduced utility costs and provide opportunities for the local government to lead by example. Municipal retrofit projects can also demonstrate new energy-saving technology or showcase the local application of existing conservation strategies.

As previously noted in Measure E-1, La Mesa has already taken steps to identify energy savings within municipal operations. The City worked with SANDAG to prepare a strategic plan to guide the community towards increased energy conservation through the City of La Mesa Energy Roadmap. The Energy Roadmap identifies energy efficiency measures across all municipal sites, including energy efficient vending machines at City Hall, the Community Center, and the Senior Center; building system retro-commissioning at City Hall; installation of pump controls and lighting retrofits at the City pool; and, lighting retrofits and the Senior Gym and Fleet Maintenance Building. Energy savings from projects identified in the Roadmap total nearly 124,000 kWh/yr and almost 1,300 therms/yr.

This measure assumes that the municipal energy efficiency projects identified in the Energy Roadmap are installed by the 2020 target year. Some jurisdictions opt to prepare a stand-alone Municipal Operations CAP that focuses on specific strategies to reduce operational emissions while maintaining high-levels of service to community members. Other jurisdictions have more generally established reduction targets related to different municipal departments, and more informally pursue their implementation. The City has set a 10% goal for reduction in electricity use for operation of municipal buildings and facilities energy. This goal will be achieved through the City's implementation of the Energy Roadmap.

As the initial step, the City has established a municipal energy efficiency goal and outlined strategies for its achievement. The City will also pursue collaborative and information-sharing opportunities with other local governments to identify additional best practices in energy conservation within municipal operations. This collaboration could lead to joint pursuit of grant funding for retrofit projects or opportunities to participate in pilot programs for new technologies. The City will also consider ongoing regional partnerships related to emissions reduction planning through SANDAG or other organizations, and identify opportunities to pursue development of a municipal operations CAP.

	Action	Responsibility	Timeline
A	Revisit municipal efficiency goal on regular cycle (e.g., every 5 years) and consider remaining retrofit opportunities when revising municipal goal		Medium-term
B	Review Energy Roadmap to identify discrete strategies that can be implemented to achieve efficiency goal; use support services provided by SANDAG's Energy Roadmap Program and discuss potential strategies with SDG&E to identify utility rebate programs, on-bill financing, or other incentive programs; work with City Facilities Manager and other department staff to develop phasing strategy for retrofit projects that considers other near-term planned building / facility retrofit work, and incorporate energy efficiency components into these planned projects, as appropriate		Near-term
C	Calculate energy and cost savings and GHG reductions related to municipal efficiency projects and share case study information on Sustain La Mesa webpage to encourage residents and businesses to explore efficiency strategies in their buildings; highlight additional co-benefits of projects, such as improved building occupant comfort		Long-term
D	Leverage the San Diego Regional Climate Collaborative and the SANDAG Regional Energy Working Group for sharing local successes and best practices in municipal operations energy efficiency; use network to identify and pursue regional funding opportunities for energy conservation or other emissions reduction-related projects		Long-term

Progress Indicators	Year
125,000 kWh/yr saved through municipal retrofit programs since 2010; 1,275 therms saved through municipal retrofit programs since 2010	2020

E-4
PUBLIC LIGHTING

Reduce energy consumption in the City's traffic signals and street lights through installation of energy-efficient lighting technology.

2020 GHG Reduction Potential: **200 MT CO_2e/yr**

Lighting efficiency upgrades typically represent one of the most cost-effective solutions for energy conservation, providing lower utility costs and reduced maintenance costs from less frequent lamp replacements. Public realm lighting in La Mesa includes traffic and street lights, municipally-owned parking lot lights, and public park lights. The City has already installed high-efficiency induction street lights using funding from the American Recovery and Reinvestment Act (ARRA), which reduced street light energy costs by half. The City has also retrofitted all traffic signals with green and red LED lights.

To maintain long-term energy savings in outdoor lighting, the City will revise its streetlight standards to require that new and replacement bulbs also use energy-efficient technology. The City will continue to monitor advancements in energy-efficient lighting technology to keep its streetlight standards up to date.

Additional energy savings may be available from City-owned park and recreation area lighting upgrades. According to La Mesa's Energy Roadmap, park lighting consumed nearly 290,000 kWh/yr in 2013. While parking lighting use was analyzed in the Roadmap, park lighting retrofit projects were not prioritized at that time. The City will continue to review park and recreation area lighting systems and energy use in future Roadmap updates to determine if opportunities for retrofits exist. The City will work with its SDG&E account representative and the Energy Roadmap Program to identify utility rebates, on-bill financing options, or other strategies to help defray program costs. The City will also consider developing an energy-efficient lighting program for park facilities that prioritizes potential candidates for future retrofits, seeks low energy use in all new facilities, and installs appropriate new lighting technologies that maintain sufficient lighting levels for applicable uses (e.g., sports play, safety).

The reductions associated with this measure take credit for the City's past actions in streetlight retrofits since the 2010 baseline year. The following implementing actions are forward looking toward additional lighting retrofit opportunities that could help the City to achieve future year emissions targets that may be established in CAP updates.

	Action	Responsibility	Timeline
A	Revise City's street lights standard to include requirement for energy-efficient technology and adaptive controls in new and replacement bulbs		Medium-term
B	Continue to monitor advancements in lighting technology, rebate/financing programs, and other factors that could prompt City to pursue deeper energy savings in municipally-owned street lights		On-going
C	Use services provided by SANDAG's Energy Roadmap Program to develop energy-efficient lighting program for park units that: identifies outdoor lighting retrofit candidates among City-owned parks and recreation areas (e.g., pathways, restroom facilities, area lighting, sport field lighting), and identifies appropriate energy-efficient lighting technologies for sports fields / courts that still provide lighting levels required for applicable sporting use		Near-term
D	Use Energy Roadmap Program and partner with SDG&E to pursue utility rebates or on-bill financing options to retrofit identified park lighting opportunities		Long-term

Progress Indicators	Year
All City-owned traffic lights and street lights are retrofitted with energy-efficient technology that reduces electricity use by 50% - **Progress Achieved!**	2020

E-5
PARKING LOT LIGHTING

Increase energy efficiency in parking lot lighting community-wide through outreach programs and information sharing.

Supporting Measure – Not Quantified

Lighting is provided in parking lots and parking structures to increase occupant safety and deter theft and vandalism. Conventional parking lot lighting, including hi-wattage metal halide and high-pressure sodium (HPS) lights, consumes more energy than new LED or induction lighting options, which provide comparable lighting quality at a fraction of the energy consumption. LED lighting adds safety and security benefits through improved color rendering of vehicles and clothing. As with many retrofit projects, the higher initial cost of LED lighting is a primary barrier to its widespread adoption. However, the longer useful life, reduced maintenance needs, and cumulative energy savings can result in a quick payback on the investment. Utility rebates, CEC low-interest loans, and PACE financing programs can also help to reduce these financial barriers.

The City has already taken steps to reduce outdoor lighting energy consumption at municipal facilities. Parking lot lights around City Hall were recently retrofitted to induction lamps and are controlled by digital timers for dusk-to-dawn control. The City plans to retrofit parking lot lighting at the Adult Center from HPS lamps to induction lamps. The City also encourages Leadership in Energy & Environmental Design (LEED) certification for new construction, which could include components of outdoor energy conservation.

To increase broader community-wide parking lot lighting retrofits, the City will encourage voluntary action with informational materials that present the simple payback calculations associated with lighting improvements, available utility-sponsored rebates/incentives, PACE financing options, safety and security benefits, and local case studies (including municipal projects). This strategy could be pursued with other regional jurisdictions through collaboration on outreach material development and messaging to reduce implementation costs and minimize redundancy in regional climate action planning efforts. The City should work with SDG&E and PACE financing providers to initiate program data-sharing strategies to allow City staff to track the efficacy of this measure in the future, and allow future CAP updates to separately quantify emissions reductions associated with outdoor lighting retrofits.

	Action	Responsibility	Timeline
A	Continue implementing municipal outdoor lighting efficiency projects, as funding allows; consider options for parking lot lighting upgrades concurrent with indoor building retrofits		On-going
B	Work with SDG&E and CSE to identify available grant/rebate programs to support lighting retrofits in public and private parking lots/garages		Long-term

	Action	Responsibility	Timeline
C	Partner with SDG&E and other regional partners in developing informational resources that highlight financing / rebate options and safety and security benefits, present local case studies (e.g., successful retrofit of a commercial plaza's parking lot lights), and illustrates simple payback scenarios for typical lighting upgrades along with reduced maintenance expense estimates; identify owners / property managers of large parking lots to target with informational resources		Long-term
D	Consider hosting roundtable discussion with SDG&E representatives, targeted property owners / managers, and participants with local success stories to identify remaining barriers to broad outdoor lighting retrofits; develop strategy to reduce / remove barriers, particularly any related to City permitting or municipal code		Long-term
E	Work with SDG&E and local PACE financing districts to develop program data-sharing strategies that allows City staff to track success of outdoor lighting retrofits; data outputs should identify total number of retrofit projects implemented / financed and related electricity savings		Long-term

E-6
SOLAR PHOTOVOLTAIC OUTREACH

Promote the voluntary installation of solar PV systems on residential and non-residential property in the community, and identify opportunities for municipal installations on City property as, well.

2020 GHG Reduction Potential: **2,725 MT CO_2e/yr**

As shown in Chapter 2, electricity-related emissions make up 37% of La Mesa's emissions inventory, suggesting that measures designed to reduce electricity consumption or provide clean electricity can play a significant role in the City's emissions target achievement. The state's preferred energy loading order identifies development of site-scale renewable energy as a secondary action that should follow energy efficiency building retrofits and other energy conservation strategies, so that PV system sizes can be minimized to match the lower building electricity demand and reduce costs of the PV system. This measure should be viewed as a companion to the other energy measures described in this CAP, and should be pursued as part of a comprehensive emissions reduction strategy.

Solar PV systems are generally installed on building rooftops or carport shading structures, and convert solar radiation into clean electricity that can offset a building's electricity use from utility grid-tied sources (e.g., power plants fueled with coal, natural gas, or nuclear energy). In 2013, the City issued 165 solar PV permits, nearly doubling the number of solar permits issued in the prior year. Further, based on SDG&E data, approximately 3.8 MW of PV generation capacity was installed community-wide between 2010 and 2014. While numerous barriers can prevent widespread adoption of solar PV technology, including local

regulations, up-front costs, and misinformation or lack of information, new opportunities for financing and collaboration have emerged that reduce these barriers and encourage greater use of solar energy.

Common barriers to PV installation include homeowner's association covenants or design review that prohibit or restrict solar panel installation, or zoning ordinances that restrict the types of districts in which solar facilities are allowed. Other barriers are more subtle, such as height restrictions, lot coverage limitations, or setback requirements that do not allow for the placement of solar panels on existing rooftops or building sites. Screening requirements for rooftop equipment and landscaping requirements that limit access to solar resources can also act as barriers.

The City will work to review its existing building codes and regulations to identify potential barriers to solar project implementation, and reduce or remove these barriers where possible. As with other measures, the City can learn from local best practices in this topic area and consult with regional jurisdictions on their past efforts to streamline the solar permitting process, reduce permit fees, or remove other regulatory barriers. Continued partnership with CSE may provide an ideal venue for this type of knowledge sharing.

Renewable energy financing and rebate programs are available to offset the initial capital costs associated with system installation. In addition to PACE financing described in Measure E-1, power purchase agreements (PPA) can help to facilitate broader community-wide PV installations. With PPAs, solar service providers install PV systems that they own and maintain, then sell the generated electricity back to the property owner at an established rate. Some of these programs also offer lease-to-own options in which property owners own the PV system at the end of their PPA contract. Rebates may also be available through the investor owned utility-funded California Solar Initiative (CSI) and its related programs, as well. CSI has a goal to create 3,000 MW of new, solar-generated electricity by 2017, and has been a source of solar PV financial incentives in the past. As the program nears completion, rebate values are expected to continue to decline, which may lead to slower PV installation growth in the future if additional financial resources are not provided.

The City will provide links to available solar rebate and financing options on the Sustain La Mesa website, and will also work to develop informational resources explaining the benefits of solar PV systems. Any outreach or informational materials should leverage related existing resources that have previously been prepared by SDG&E, Energy Upgrade California, CSE, and other renewable energy advocates. The City can also play a facilitator role by convening solar service providers and Chamber of Commerce representatives in a roundtable discussion on barriers to local solar installations among La Mesa's business community and strategies to overcome those real and perceived barriers. City staff with a public interface role in the building permitting process will also continue to be trained on the City's solar PV permitting process, available rebates and financing programs, and frequently asked questions to provide an informational resource for community members.

In addition to broadly encouraging community solar installations, the City will identify municipal buildings or facilities that would be good candidate sites for a PV system. Cities throughout California have used direct ownership, financing models like PPAs, or regional procurement programs to pursue municipal PV projects. A regional procurement program could allow San Diego area governments to leverage their combined purchasing power into favorable solar contract terms, accelerated project financing, and reduced transaction costs. Alameda County led development of the Regional Renewable Energy Procurement (R-REP) project, which provides a collaborative approach to public solar projects among public agencies throughout Alameda, Contra Costa, San Mateo, and Santa Clara Counties. The program has already facilitated the installation of 30 MW of solar PV systems at over 180 sites.

La Mesa will engage its regional partners to identify local interest in such a collaborative approach, as one option to help pursue municipal PV systems. The City will also work with its SDG&E account representative to determine if utility-sponsored rebate or incentive programs are available to offset initial PV installation costs. When researching viable solar sites, the City will also consider the options to pursue a stand-alone solar project or a broader energy service contract that identifies and finances municipal energy efficiency projects in addition to renewable energy systems.

	Action	Responsibility	Timeline
A	Review / revise all applicable building, zoning, and other codes and ordinances to identify potential regulatory barriers to installation of solar PVs in residential and nonresidential construction; work to remove identified barriers		Near-term
B	Explore opportunities to streamline permitting process (e.g., building, electric, plumbing) for solar PV systems or reduce solar permitting fees; train Building Department counter staff in City's solar permitting process to assist community members through process		Near-term
C	Work with CSE, PACE districts, and neighboring jurisdictions to develop comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including directory of existing rebates / incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance; leverage existing solar PV informational materials from CSE, California Solar Initiative, SDG&E, and other organizations		Medium-term
D	Identify local solar service providers, and convene roundtable discussion with providers and local Chamber of Commerce representatives who can disseminate discussion information among area businesses regarding solar system financing options		Medium-term
E	Provide training to Planning Department and Building Division counter staff regarding available sources for rebates / financing / incentives, as well as printed pamphlets or FAQ sheets for distribution to customers seeking permits for new construction or major renovation projects; provide links to similar information on Sustain La Mesa webpage		Near-term
F	Identify opportunity sites on City buildings or parking lots for municipal solar PV installation; partner with CSE to investigate interest in pursuing regional renewable energy procurement program with other area governments and public agencies		Long-term

Progress Indicators	Year
6.13 MW solar capacity installed community-wide since 2010 baseline year; systems generate approximately 11 million kWh/yr	2020

E-7
SOLAR HOT WATER HEATER OUTREACH PROGRAM

Promote voluntary installation of solar water heaters in new construction and building retrofits through outreach campaign.

Supporting Measure – Not Quantified

By using the sun's energy to heat or preheat water, solar hot water heaters can complement natural gas or electric systems, reducing utility use, costs, and carbon emissions. Solar water heating systems include solar collectors, typically placed on roofs, which are attached to an insulated water storage tank. According to the CSI, solar hot water systems can lower energy bills by meeting 50 to 80% of hot water needs. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470) created a 10-year program aimed at installing solar water heaters in homes and businesses and was designed to lower system purchase costs, which typically range from $3,000 to $6,000. Similar to solar PV installations, rebate programs and other financing options (such as PACE programs) can help reduce upfront installation costs.

To implement the goals of AB 1470, SDG&E developed a Solar Water Heating Pilot Program, which it ran from 2007-2010. This program identified numerous barriers to the widespread adoption of solar water heating systems. In particular, participating contractors named permitting and inspection costs and delays as a primary obstacle to widespread adoption for single-family residential buildings because non-material costs represented approximately 65% of total system costs. That means, only 35% of total costs were related to the actual system price. The current low cost of natural gas, commonly used in traditional water heaters, further decreases demand for solar hot water systems by increasing their payback period.

Given the previous low levels of participation in the CSI-Thermal program, this CAP assumes continued low participation through the 2020 target year, and does not estimate emissions reductions from this measure. However, solar hot water heating strategies could play an important role in achieving the state's long-term emissions reduction goals (i.e., 80% below 1990 levels by 2050), and could experience enhanced attention for broad implementation in the future. In addition to revised utility rebate program rate structures, there are also some initial actions the City can take to lay the foundation for future implementation. While the City cannot influence global energy prices, it can work to reduce the non-system costs identified in SDG&E's pilot program (e.g., permitting costs and process duration). This would reduce or remove one barrier to broader adoption, and help make solar hot water systems a more attractive alternative, should natural gas prices increase or system costs decrease in the future. The City can also act a facilitator among rebate and financing entities (e.g., CSE, PACE districts), potential customers (e.g., local business community), and technical practitioners (e.g., Building Division staff, local contractors) to identify barriers to installation and collaboratively develop solutions to these barriers.

	Action	Responsibility	Timeline
A	Work with CSE to understand non-system costs identified in solar hot water pilot program, and work to reduce costs associated with City requirements by streamlining permitting process and reducing / removing permit fees; City could consider providing priority permitting for building-scale renewable energy systems, such as PV and solar hot water projects		Near-term
B	Provide training to Planning Department and Building Division counter staff regarding available sources for rebates/incentives; provide similar information on the Sustain La Mesa webpage, and identify local success stories that can be shared		Medium-term
C	Leverage information and research from CSE and CSI-Thermal Program to provide informational materials at Building Permit counter to new applicants		Long-term
D	Consider municipal opportunities for solar hot water systems at facilities with high hot water heating loads, such as City swimming pools and recreation centers (review Energy Roadmap energy assessment data to identify such opportunities)		Long-term
E	Work with SDG&E to identify local businesses with high hot water heating load that could benefit from installation of solar hot water system (alternatively, work with local Chamber of Commerce to identify these businesses, if SDG&E is not able to provide this information due to confidentiality requirements); convene roundtable discussion that includes CSE, SDG&E, local PACE districts, City Building Division permitting staff, identified local businesses, and local Chamber of Commerce representatives to discuss potential opportunities for, and barriers to installation of solar hot water systems		Long-term

E-8
SOLAR READY CONSTRUCTION

Encourage builders to incorporate solar-ready design into new construction, including building orientation for maximum solar exposure, pre-wiring and pre-plumbing for solar PV and solar hot water, and roof system construction that can handle additional loads from potential future solar installations.

Supporting Measure – Not Quantified

As previously described, increasing the use of distributed renewable energy systems (e.g., rooftop solar) prevents the combustion of fossil fuels to generate electricity and heat water, thereby reducing GHG emissions. La Mesa's location and geography provides a high solar insolation rating, which makes it an excellent candidate for effective adoption of solar technologies. In addition to strategies described in Measures E-6 and E-7, the City can further facilitate installation of solar technologies by encouraging new

construction to be oriented for maximum solar access, pre-wired and pre-plumbed to support future systems, and constructed to support roof loads from solar installations. These early considerations can reduce costs associated with solar design retrofits for homeowners.

To support additional voluntary installation of solar energy systems, the City can work with builders and applicants during the design phase to provide the supporting solar infrastructure at the time of construction. The City can provide technical assistance in solar design or share information on solar-ready construction techniques. In the near-term, the City will continue to implement its Sustainable Building Policy that evaluates the feasibility of integrating sustainable building techniques into new buildings and major retrofits. It can also refer building applicants to SDG&E's Savings by Design program, which offers financial incentives and additional design assistance for high-performance projects.

In the long-term, the City can consider revising its building code to require solar pre-wiring and pre-plumbing for new construction; an approach that has been used in jurisdictions throughout the state. Alternatively, the City may continue to implement the most current version of the CalGreen Building Code, and rely on the state to revise building requirements related to solar pre-design.

This measure supports implementation of Measures E-6 and E-7, and is not quantified separately.

Action		Responsibility	Timeline
A	Work with SDG&E, CSE, building industry and contractor associations, and other local jurisdictions to develop and/or promote available technical assistance programs to help developers and builders minimize costs associated with solar-ready design and construction		Medium-term
B	Consider revising City's building code to require solar pre-wiring and pre-plumbing for new construction; review similar requirements from other jurisdictions to define ordinance language		Long-term

Transportation and Land Use Strategy

Transportation-related emissions make up approximately 31% of the community-wide baseline emissions inventory. While vehicle fuel efficiency, fuel carbon content (amount of carbon dioxide released in relation to energy produced), and vehicle operations all influence the amount of transportation emissions generated in a community, the amount also depends on the number of vehicle miles traveled (VMT) by residents and employees. Long vehicle trips and high numbers of trips create higher emissions.

While state-mandated technological changes in fuel efficiency and reductions in fuel carbon content are estimated to greatly reduce transportation emissions, additional reductions will require local and regional action. For example, by eliminating or shortening vehicle trips through increased alternative transportation options, such as transit, bicycling, or walking, and through the distribution of diverse land uses relative to transportation options. Where people live, work, shop, and play also determines how far they have to travel daily, whether they choose to walk, bike, use public transit, or drive. Measures that support mixed land uses and opportunities for higher-density development along transit routes are essential to supporting alternative transportation options.

The Transportation and Land Use Strategy includes bicycle infrastructure improvements and pedestrian mobility enhancements to encourage walking and biking between nearby destinations. Improving transit services and access to transit stops also supports multi-modal circulation options. Facilitating a transition to alternative fueled vehicles can provide long-term emissions reductions as the community-wide mix of vehicles shifts with broader vehicle market transformations. This includes incorporating alternative fueled vehicles in the municipal fleet, and facilitating installation of charging and refueling stations for community use.

As previously mentioned, while many of the CAP measures provide quantified emissions reduction estimates, some have been identified as “supporting measures.” Most measures within the Transportation and Land Use Strategy are not quantified because they overlap with already anticipated VMT reductions included in the City’s emissions forecasts, or are either envisioned as a long-term strategy that would not be implemented prior to the 2020 target year or lack the necessary data to allow quantification at this time. However, even if the emissions reductions from certain measures cannot be accurately estimated, the benefits related to measure implementation will still occur within the community. Safer bicyclists and expanded biking routes, enhanced access to regional travel demand management programs, land use strategies that support non-automotive trips, and healthier air quality from increased use of alternative fuel vehicles are all associated with implementation of the following measures. It should also be noted that even though some VMT reductions were incorporated within the baseline emissions inventory, their specific impact (i.e., emissions reductions amount) was not evaluated as part of this CAP. This could be an area of research and reduction measure development for future revisions to the CAP.

Emissions reductions from the Transportation and Land Use Strategy total 50 MT CO_2e/yr in 2020, representing less than 1% of total local CAP measure reductions. In general, these measures require infrastructure development or broad market shifts to adopt emerging technologies, both of which are likely to occur on a longer time frame than the CAP’s near-term 2020 target. However, implementation of these measures in the near-term should result in significant emissions reductions in future inventory and CAP updates.

T-1
BICYCLE AND PEDESTRIAN INFRASTRUCTURE DEVELOPMENT

Continue to plan for and construct safe, attractive bicycle and pedestrian paths and facilities within the community, and provide education programs aimed at increasing use of alternative transportation options.

2020 GHG Reduction Potential: **50 MT CO_2e/yr**

Pedestrian enhancements support safe and comfortable walking environments, potentially increasing foot traffic to retail establishments and businesses, while decreasing automobile trips and emissions. Pedestrian enhancements include the provision of seating, shading, way-finding signs, safe crosswalks, and traffic calming measures. Providing connectivity and convenient, enjoyable pedestrian areas also improves residents' quality of life. Similarly, bicycle infrastructure improvements can increase ridership through an expanded geographic reach or depth of services provided. Bicycle infrastructure includes designated on-street lanes, striping and signage indicating bike paths and shared roadways, secure and visible bicycle storage, and end-of-trip facilities for bicycle commuters. Pedestrian and Bicycle Facility Plans provide a framework for local governments to address pedestrian and bicycle safety, and identify important improvements to increase safety and comfort within a community.

The California State Legislature passed the Complete Streets Act of 2008 (AB 1358), followed by adoption of the federal Safe and Complete Streets Act of 2011. Complete streets describe those that are planned and designed for use by everyone and for all modes of transportation (e.g., automobiles, bicycles, walking). The City adopted a Bicycle Facilities and Alternative Transportation Plan, in accordance with AB 1358 legislation. The Plan identifies bicycle and pedestrian needs throughout the city and describes opportunities to connect and integrate existing and proposed facilities.

Per the City's Plan, there are 12.8 miles of existing Class II bike routes (i.e., on-street designated and striped bike lanes), with an additional 12.8 miles planned for future installation. Other related previously adopted plans have addressed neighborhood traffic management (February 2004), walkability (February 2006), and pedestrian and bicycle crossings over area freeways (December 2008). In 2012, La Mesa earned the Most Walkable City designation by WalkSanDiego (now called Circulate San Diego). New sidewalk construction has also occurred as a result of the Sidewalk Master Plan.

To further support the development of complete streets, the City will continue to make infrastructure enhancements, as identified in the Bicycle Facilities and Alternative Transportation Plan, as well as continue to improve the pedestrian environment to increase comfort and safe walkability. Regular updates of these plans will allow the City to prioritize projects based on up-to-date community priorities and funding opportunities. In addition to safe routes for riders, bicycle commuting can also be encouraged if end-of-trip facilities are available where commuters can store their bikes and change clothes and/or shower. The City will work with project developers to identify opportunities to include shower and/or locker room facilities in new construction or major tenant improvements. The City will also work with the Chamber of Commerce to identify high-priority sites for the installation of bike parking facilities to support

bike trips to local restaurants, retail, and employment centers. Other cities have partnered with their local artist community on similar projects to infuse local character into new bicycle parking projects among local businesses. A similar approach could be used in La Mesa to increase awareness around the City's bicycle infrastructure investments.

	Action	Responsibility	Timeline
A	Prioritize implementation of pedestrian enhancements (e.g., pedestrian islands, roundabouts) as identified in City's Sidewalk Master Plan and bicycle improvements as identified in City's Bicycle Facilities and Alternative Transportation Plan; continue to maintain these plans through regular updates (e.g., every 3-5 years, or as required to maintain eligibility for pedestrian and bicycle infrastructure grant programs)		On-going
B	Leverage SANDAG's iCommute program to help encourage businesses and new non-residential development to provide bicycle commuter facilities (e.g., showers, lockers) to support employees' alternative transportation options		Near-term
C	Work with local Chamber of Commerce to install additional bike parking facilities in front of retail, restaurants, and employment centers; encourage use of creative / attractive bike parking systems designed by local artists that reflect character of nearby businesses or neighborhoods		Medium-term

Progress Indicators	Year
3 miles of new Class II bike lanes are installed community-wide (in addition to existing 12.8 miles) and bike commute mode split increases from 0.2% to 0.5%	2020

T-2
BICYCLE SAFETY OUTREACH

Develop a bicycle outreach program to promote community-wide "bikeability" through safety programs, bicycle tune-up clinics, and partnerships with bicycle advocacy groups and cycling clubs.

Supporting Measure – Not Quantified

Bicycling can be a healthy and enjoyable alternative to driving that reduces VMT, resulting in lower community-wide emissions and local air quality improvement. In addition to supportive bicycle infrastructure described in Measure T-1, bicycle education and outreach programs are also important to increase bicycle safety and ridership within the community. These programs can increase community members' comfort with cycling for exercise or daily errands through instruction on proper bicycle

maintenance, safe cycling techniques, and an introduction to local cycling groups. The San Diego Regional Safe Routes to School (SRTS) Program consists of a broad network of public health agencies, community based organizations, pedestrian and bicycle advocates, school officials, teachers, parents, and more that work together to create a fun, healthy, and safe environment for children to walk or bike to school.

Through implementation of its Sidewalk Master Plan and Bicycle Facilities and Alternative Transportation Plan, the City encourages non-automobile transportation with installation and improvements to sidewalks, bicycle lanes, and pedestrian-friendly zones. The Bicycle Facilities and Alternative Transportation Plan was recently revised with a "Safe Routes to Transit" component to further increase access to this alternative transportation option. The City will continue working with SANDAG to provide bicycle safety training and educational activities, and will work with local cycling groups to identify opportunities for bike safety improvements within the community.

The CAP assumes that implementation of this measure will broadly support the efforts of increasing community-wide cycling and contribute to VMT reductions. Associated emissions reductions from this transportation shift are included within Measure T-1 above.

	Action	Responsibility	Timeline
A	Work with SANDAG to continue its bicycle safety education activities, centered around May is Bike Month, including bicycle rodeos and Walk-and-Roll programs at local schools; work with community organizations and local bicycle advocacy groups to provide additional bicycle rodeos targeting school-aged population, possibly as end-of-summer event or at start of each new school year		On-going
B	Solicit comments from local cycling clubs / advocacy groups to identify dangerous cycling conditions within community as part of regular implementation of Bicycle Facilities and Alternative Transportation Plan; identify opportunities to address problem areas through SRTS Program grants, SANDAG grants, or other alternative transportation funding sources (possibly SDAPCD funding programs)		Medium-term

T-3
TRANSPORTATION DEMAND MANAGEMENT PROGRAM

Encourage use of SANDAG's iCommute program to reduce single-occupancy vehicle trips community-wide.

Supporting Measure – Not Quantified

Transportation demand management (TDM) programs apply strategies and policies to reduce travel demand (specifically single-occupancy vehicles) and traffic congestion, particularly at peak commute hours. Instead of increasing capacity by widening or adding roadway, TDMs promote subsidized or pre-tax transit passes, flexible work hours, emergency rides home (or guaranteed ride home), vanpool or carpool incentives, and parking cash-out programs that pay employees who agree to give up their guaranteed parking spaces, as a means to reduce VMT and transportation-related emissions.

Within the region, several agencies have programs and measures that encourage alternatives to driving alone. Based on a review of SANDAG's iCommute offerings, the City can encourage residents and businesses to take advantage of existing transit services, as well as ridesharing through online carpooling services and reduced vanpool leasing fees. These programs offer an opportunity for the City to develop partnerships that leverage resources, expand incentives, and further support efforts to reduce regional traffic congestion, lower emissions, and improve public health.

As of 2014, iCommute had 17 vanpools originating in La Mesa and more than 20 registered users with La Mesa zip codes. City data showed several staff members active in the City's employer commute program, as well. The City will leverage community partnerships and available outreach and informational resources to increase voluntary participation within SANDAG's and other transportation demand management programs. The City will work with the local Chamber of Commerce to identify employers currently offering commuter benefit programs and local employers that might find value in developing a customized employee commuter benefits program. The City will then host a knowledge-sharing workshop with assistance from SANDAG. Alternatively, the City could develop its own customized TDM program to be offered community-wide through free support and tools from SANDAG. The City may find that partnering with several other local jurisdictions on a commuter benefits program is more advantageous given the diffuse nature of employment centers in the San Diego area.

This measure does not estimate reductions associated with this program given the current low levels of participation in the iCommute program and short implementation timeframe through the 2020 target year. However, this measure has the potential to significantly reduce VMT within the City, which would help to achieve future long-term emissions reduction targets.

	Action	Responsibility	Timeline
A	Add link to iCommute on Sustain La Mesa webpage		Near-term
B	Work with SANDAG and area jurisdictions to develop outreach campaign that encourages use of iCommute program offerings; work with local Chamber of Commerce to identify employers that would benefit from customized commuter benefits program, as offered through SANDAG; identify local employers currently offering commuter benefits programs, and host knowledge-sharing workshop with Chamber of Commerce representatives, previously identified local businesses, and iCommute program representatives to discuss program structures and cost / benefit considerations		Medium-term
C	Consider developing City employee commuter program, independently or with support from SANDAG, to include transportation benefits such as carpool / vanpool priority parking areas, electric vehicle charging stations, secure bicycle parking, access to locker room / shower facilities, and possibly subsidized transit passes		Long-term

T-4

MIXED-USE AND TRANSIT-ORIENTED DEVELOPMENT

Continue to encourage mixed-use and transit-oriented development through land use and zoning designations to support alternative transportation opportunities.

Supporting Measure – Not Quantified

Transit-oriented development (TOD) places higher density and intensity development within walking distance of primary transit stops. This strategy brings residents and jobs closer to transit opportunities, providing additional ridership for the public transit system. Successful TOD can take various shapes, depending on the character of the community. TOD can focus on increasing employment near transit stops, typically within a ½-mile radius, provided adequate pedestrian connectivity is available for riders to then reach their jobs. It can also focus on increasing residential densities near transit stops, usually within a ¼-mile radius.

TOD can also include a mix of uses (e.g., residential, office, retail) when the goal is to develop a more complete neighborhood center. The distribution of land uses and the degree of street connectivity within a city also influences how people travel. Land use strategies that place daily needs near each other and near residential neighborhoods allows some trips to be made without a car. Development patterns that provide convenient pedestrian connectivity to parks, schools, retail, and jobs also supports non-automotive transportation options. Mixed-use development often creates these pedestrian-friendly

environments with a variety of uses nearby that allow people to address some or all of their daily live, work, play, and shop needs in one place.

Community opposition to increased densities or intensities may hinder local efforts to encourage TOD and mixed-use developments. Local land use and development policies may also pose a barrier. Parking standards that ignore the potential for reduced automobile trips from these project types may inhibit development due to the high cost of providing parking. The City's Mixed Use Urban Overlay Zone already supports compact urban development and pedestrian-oriented neighborhoods.

SANDAG created a Regional Parking Management Toolbox to support local governments in designing and implementing parking management strategies. The Toolbox presents common parking system challenges and corresponding strategies across 12 different community typologies identified within the San Diego area (e.g., urban center, suburban employment center, coastal community). The toolbox can be used to develop community-specific solutions to parking problems, and could be applied to mixed-use or TOD areas within La Mesa to help further facilitate that type of development without generating new parking concerns.

SANDAG is also beginning development of a "mobility hub" planning process, through which to promote alternative transportation strategies, such as carsharing, bikesharing, and neighborhood electric vehicles for short trips within a neighborhood or to connect to transit stations for longer trips. While the mobility hubs program is in its early phases of development and no hubs or funding programs have been defined yet, it could potentially provide a substantial source of long-term VMT-related emissions reductions within the community. As with other transportation and land use strategies, full implementation will occur on a longer time horizon than other CAP strategies, so early participation in regional planning efforts will be critical for local success in the future.

The City should continue to identify areas that can support the increased densities and activities associated with mixed-use development strategies, during future General Plan updates and preparation of Specific Plans. This might include analyzing infrastructure capacity and developing infrastructure investment strategies, identifying amenities that can be constructed in planned higher-density development areas to help attract investment, restructuring development impact fees to reflect reduced public facilities demand associated with more compact development, considering the distribution of shared parking opportunities, and identifying strategies to increase densities around primary transit nodes. For example, the City's trolley stations are currently outside of the mixed-use overlay zone, though some are surrounded by land use designations that potentially allow for mixed-use developments. Opportunities may exist to expand these mixed-use designations or overlay zone to additional trolley station areas in future land use planning efforts to further improve residents' and employees' access to transit and increase the ridership base. This would also provide the added benefit of reducing off-street parking requirements within these areas, to further incentivize development. As the City explores potential barriers to additional TOD or mixed-use projects, it should also evaluate the parking-related strategies within the Toolbox for applicability within La Mesa.

Like other strategies in this CAP, encouraging and facilitating TOD is a long-term emissions reduction strategy. It is facilitated by an evolution of the existing urban fabric that could take decades to complete, depending on local and regional market conditions and availability of funding for public infrastructure improvements, among other factors. TOD strategies will provide significant emissions reductions in the future, but may provide relatively lower reductions by the 2020 target year. Should the City decide to

establish longer-term targets, this measure should be considered for early implementation because it will occur on a longer time horizon than other CAP measures.

	Action	Responsibility	Timeline
A	Host roundtable discussion or individual interviews with local development community to identify primary barriers to higher-density / intensity development within the community; take steps to reduce / remove identified municipal barriers to such development to facilitate higher-density development within designated areas to increase potential ridership of residents and employees along existing transit routes		
B	Work with SANDAG to enhance local transit service options in designated higher-density, mixed-use development areas to take advantage of proximity to new potential transit riders; participate in future SANDAG-led mobility hub planning programs to lay foundation for long-term VMT reduction opportunities in La Mesa		
C	Conduct parking surveys in areas with good transit access (e.g., downtown) to determine if existing parking is adequate in quantity and location for future increased development density / intensities; pending conclusions of parking analysis (i.e., if existing parking standards are found to be too high), reduce off-street parking requirements in these areas for transit-oriented and mixed-use developments, for developments providing shared parking, and / or for developments that incorporate certain travel demand management measures		
D	As part of on-going General Plan implementation and future land use planning work, identify areas that could support a net increase in population or employment through land use changes within ¼ - ½ mile walking distance to transit stops (e.g., trolley station areas); work with Public Works Department to evaluate capacity for higher-density / intensity development in these areas, and develop prioritization and funding strategies to complete necessary infrastructure improvements		

T-5
ALTERNATIVE REFUELING INFRASTRUCTURE DEVELOPMENT

Support community-wide use of alternative fuel vehicles through expansion of alternative vehicle refueling infrastructure.

Supporting Measure – Not Quantified

Alternative-fueled vehicles use electricity, compressed natural gas (CNG), liquefied petroleum gas (LPG), hydrogen electric fuel cells, and other fuel sources that have lower carbon content than traditional gasoline and diesel fuel. Zero-emissions vehicles (ZEVs), which include electric and hydrogen electric

fuel-cell vehicles, emit no tailpipe pollutants. As engine technologies have continued to advance, alternative-fueled vehicles have become increasingly popular to reduce fuel costs and emissions.

One of the primary challenges to broad adoption of alternative-fueled vehicles, including ZEVs, has been the limited refueling infrastructure available to support a range of vehicle types. Often referred to as "range anxiety," an incomplete network of refueling infrastructure limits broad adoption of these vehicles as drivers feel confined to the limits of their known refueling locations. Local governments can play a role in combatting range anxiety by supporting cost-effective opportunities to install recharging infrastructure for electric vehicles (EV), requiring pre-wiring for electric charging stations in new developments and parking lots, and working regionally to construct more expensive infrastructure, such as CNG, LPG, and hydrogen refueling stations. Additionally, studies have shown that the majority of EV charging takes place at home, which indicates a role for retrofits to existing residential properties to support installation of EV charging stations.

The majority of EV charging takes place at home, where vehicles can be left to charge overnight and can take advantage of utility time-of-use pricing discounts. However, most existing construction was developed prior to consideration of vehicles' charging needs in the garage or carport. Depending on the age of the building, its electrical system, and the design of the garage, electrical retrofits to accommodate an at-home EV charging unit could cost several hundred to several thousand dollars. Increasingly, pre-wiring to accommodate the future installation of EV charging systems is being designed into new residential and commercial construction. Retrofitting existing multi-family rental properties poses an additional unique challenge since the tenants do not own their garages or carport areas or have the ability to install their own charging stations.

According to the San Diego Regional Plug-In Electric Vehicle Readiness Plan, no jurisdictions within the county currently require EV charging station installation in development projects. However, the Cities of San Diego and Oceanside have developed permitting guidance to help streamline the EV installation process. To facilitate the installation of at-home charging infrastructure in La Mesa, the City will continue to participate in regional dialogue regarding building codes among San Diego area jurisdictions to identify and implement best practices, potentially including pre-wiring requirements for new construction. At a minimum, the requirements should apply to new residential construction. Expansion to new commercial construction would help to increase the presence of EV charging units available in the workplace, and for public use in retail and office parking lots. The City should also collaborate with other local governments to develop a strategy for increasing installation of EV charging units in existing multi-family rental properties.

CNG is another alternative-fuel technology that requires special refueling infrastructure. CNG vehicles have become more common in large vehicle fleets, such as trash trucks, shuttle buses, transit buses, municipal bus fleets or delivery vehicle fleets, because they provide significant emissions reductions over diesel engines and currently offer fuel price savings as a result of increased domestic natural gas production. There are also CNG passenger vehicle and light-duty truck models available for use by the general public. Installing CNG refueling infrastructure can be expensive, but could provide another opportunity for regional collaboration to fund a shared facility for municipal and community use. EDCO, the City's waste disposal vendor, is currently installing a CNG station in La Mesa, which it also plans to make open to the public. The City will work with the San Diego Regional Clean Cities Coalition, as well as Refuel: San Diego Regional Alternative Fuel Coordinating Council, to identify strategies for increasing the availability of refueling and recharging infrastructure community-wide, as well as implementing community outreach on the benefits of alternative-fueled vehicles. Refuel, a SANDAG program in partnership with

the Clean Cities Coalition and SDAPCD, is currently developing a regional readiness plan for alternative fuels.

	Action	Responsibility	Timeline
A	Participate in regional discussions regarding application and development of pre-wiring requirements for at-home electric vehicle charging ports in new single-family and multi-family construction; update City's building code to reflect regional approach		Near-term
B	Partner with SANDAG, SDAPCD, and local multi-family property managers to develop strategies to increase installations of EV charging infrastructure in existing multi-family complexes, including development of technical guidance, permitting support from Building Division, and identification of rebates or financing options		Medium-term
C	Require installation of public-use EV charging units in parking lots of new non-residential construction; work with regional partners to establish threshold for such requirements (e.g., new construction of more than 10,000 sqft, parking lots with more than 20 parking spaces); update City's Building Code to reflect these changes		Near-term
D	Coordinate with SANDAG and other regional partners to develop informational brochures and technical support for developers / contractors installing electric vehicle charging ports in new projects; share information on City's website		Medium-term
E	Participate in regional discussions with SANDAG and SDG&E on technical aspects of alternative refueling infrastructure development, as it relates to increased electricity demand and / or natural gas service expansion, as well as long-term infrastructure development strategies to support broad regional transition towards alternative fuel vehicle options		Long-term
F	Partner with SANDAG, SDAPCD, and other area jurisdictions in exploring cost-effective ways to increase alternative vehicle charging / refueling infrastructure available for public use within community, through grant funded opportunities or partnerships with technology providers (e.g., EV charging infrastructure providers)		Medium-term
G	As alternative fueling and recharging station options become available throughout city and region, provide links to maps showing their location on Sustain La Mesa webpage; include information on available clean vehicle rebate programs, as well		Near-term

T-6
MUNICIPAL FLEET TRANSITION

Continue to transition the municipal vehicle fleet from gasoline- and diesel-powered vehicles to alternative-fuel or other low-emissions vehicles.

2020 GHG Reduction Potential: **5 MT CO_2e/yr**

CNG, EVs, and hybrid vehicles are increasingly being incorporated into municipal fleets nationwide to help reduce vehicle-related emissions and show sustainability leadership at the local government level. Although the municipal fleet represents a small subset of the community-wide transportation emissions, the City can take a leadership role in promoting the benefits and opportunities associated with low-emissions vehicles, and possibly realize operational cost savings (depending on the vehicles selected and associated fuel/energy costs).

The City already owns four hybrid vehicles for use by the City's building inspectors and parking enforcement, which reduce gasoline consumption. Other departments have begun incorporating high-efficiency vehicle models. The Police Department is employing new Ford models that are 14% more fuel efficient than their predecessors, and nine vehicles in the Public Works Department were replaced with lower emissions models. The La Mesa-Spring Valley School District has also begun switching to clean diesel buses. The City is further improving vehicle efficiency though use of AIMS Fuelmaster devices on all EMS vehicles, with plans to install the devices on all new and existing vehicles to help monitor vehicle fuel consumption and support early identification of maintenance issues.

The City analyzed alternative fuel vehicle opportunities within its municipal fleet through the Energy Roadmap Program. This analysis identified five vehicles that could be good candidates for replacement with alternative fuel vehicles given their high annual mileage use and existing alternative fuel vehicle options. Of those five vehicles, two were passenger cars that could be replaced with hybrid electric vehicles in the near-term. The other three were trucks that could potentially be replaced with propane or CNG vehicle options, if sufficient refueling infrastructure is developed for convenient use. This measure estimates reductions associated with the two hybrid vehicle replacement options by the 2020 target year. It is assumed that propane or CNG refueling infrastructure development would occur after 2020.

To formalize its fleet transition towards lower emissions models, the City will develop fleet-related targets, such as an emissions reduction target, fuel consumption target, or specific vehicle type targets (e.g., 15% EV models, 10% CNG models, 25%, ultra-low-emissions models). As described in Measure T-5, the City can also pursue installation of refueling and recharging infrastructure, including EV charging units or a CNG facility. To track implementation success, the City should continue to maintain a detailed vehicle fleet inventory annually log information on each vehicle's make, model, age, mileage, fuel consumption (by fuel type), associated department, lease expiration date or estimated date of replacement, opportunities for downsizing or consolidation with other vehicles, and potential vehicle replacement models. Accurately collecting this information will allow the City to track progress towards multiple fleet-related goals and better plan for long-term refueling/recharging infrastructure investments.

	Action	Responsibility	Timeline
A	Develop municipal fleet low-carbon target; defined as A) Total vehicle fleet composed of X% zero- or lower-carbon vehicles, B) Total vehicle fleet emissions reduction target (can be achieved through combination of reduced VMT, vehicle technology, mode shift, etc.), or C) Total annual fuel use target; define vehicle fleet transition pathway to achieve selected target		Medium-term
B	Refer to the vehicle fleet assessment as part of the Energy Roadmap when deciding which vehicles to replace with alternative-fuel vehicles; regularly update the assessment to identify opportunities for future vehicle replacement.		Medium-term
C	At time of replacement, shift passenger vehicle purchases toward EV, hybrid-electric, hydrogen fuel cell, or CNG models (if City is considering broader CNG applications in the fleet); consider new vehicles' carbon emissions and fuel efficiency as regular procurement criterion		On-going
D	Explore joint procurement options with other area jurisdictions to leverage regional shift towards cleaner municipal fleets into lower per vehicle costs; to facilitate this, connect with Public Fleet Supervisors Association to identify partnership opportunities, competitive vendor pricing, and industry best management practices		Medium-term
E	Pursue grant funding, vendor's promotional offers, or regional joint-procurement partnerships to install alternative fuel charging stations at City facilities for use by municipal vehicles and the public.		Medium-term

Progress Indicators	Year
220 gallons of gasoline/yr saved from passenger vehicle replacement; 340 gallons of gasoline/yr saved from light-duty truck replacement	2020

Water Strategy

Water-related GHG emissions are primarily a result of energy used to pump, transport, and treat potable water, and treat wastewater. Emissions associated with this sector accounted for approximately 4% of the community-wide GHG inventory, which indicates a relatively small role for water conservation in the City's emissions reduction strategy. However, with water supplies on the decline, water conservation strategies have the added benefit of aligning demand with future water availability.

This strategy area considers emissions reductions resulting from local implementation of statewide water conservation legislation. It also considers potential opportunities for future recycled water use in irrigation within the community to further conserve potable water supplies. The total GHG emissions reduction potential of the Water Strategy is 1,330 MT CO_2e/yr in 2020. This represents approximately 9% of total local CAP measure reductions.

W-1

URBAN WATER MANAGEMENT PLAN PROGRAMS

Support Helix Water District in implementing outreach and community education programs related to water conservation policies contained within the Urban Water Management Plan.

2020 GHG Reduction Potential: **1,330 MT CO_2e/yr**

The state has made water conservation a priority through adoption of SB X7-7 in 2009, which requires the California to achieve a 20% reduction in urban per-capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per-capita water use by at least 10% on or before December 31, 2015. SB X7-7 requires each urban retail water supplier to develop both long-term urban water use targets and an interim urban water use target. This law also creates a framework for future planning and actions for urban and agricultural users to reduce per-capita water consumption by 20% by 2020.

More recently, Governor Brown signed Executive Order B-29-15, which requires the State Water Resources Control Board to impose restrictions to achieve a statewide 25% reduction in potable urban water use through February 28, 2016 compared to the amount used in 2013.[vii] The order includes measures to save water by reducing per-capita water use, requires increased enforcement, including water conservation pricing measures, prioritizes and streamlines water supply infrastructure projects, and invests in new water saving technologies. The measure applies to urban water users, as well as agricultural users, and also includes actions affecting water agencies with depleted groundwater basins.[viii]

As part of its 2010 Urban Water Management Plan (UWMP), the Helix Water District demonstrates its current and future abilities to provide water within its service boundaries. The Helix Water District

incorporated its water conservation targets and plan into its current UWMP. In general, the plan identifies best management practices (BMPs) in water conservation, including:

- residential water surveys and retrofits;
- landscape water audits, leak detection, and turf removal and water-efficient device rebates;
- metering and conservation pricing;
- public information and educational programs;
- water-efficient appliance and high-efficiency toilet rebates; and,
- water waste prevention measures.

The City already provides links to information on the Sustain La Mesa webpage regarding water conservation, including links to Helix Water District's water conservation tips webpage and the San Diego County Water Authority webpage. Also, as previously described, the City participates in two PACE financing districts that offer residents and businesses financing options for qualifying water-conservation improvements. Water conservation rebates may also be available from SoCal WaterSmart. In addition to these water-conserving activities, the City will establish a framework for tracking municipal water use and consider developing a municipal water use target to be achieved through various efforts, including installation of water-conserving devices and irrigation systems, and employee education.

Emissions reductions associated with this measure are based on the assumption that the Helix Water District will successfully achieve the water conservation requirements included in SB-X7-7 (i.e., 20% below 2010 per-capita levels), and that the Water District will be the primary lead in implementation of the UWMP strategies. While Executive Order B-29-25 temporarily imposes higher water conservation targets through early 2016, this CAP conservatively estimated reductions associated with the existing 2020 reduction targets of SB-X7-7. Should the state decide to extend more aggressive water conservation requirements through 2020, then additional emissions reductions would occur locally, and would be reflected in future emissions inventory updates.

	Action	Responsibility	Timeline
A	Participate in Helix Water District outreach programs, as necessary, to increase community awareness and activity in water conservation programs; discuss opportunities with Helix to assist in promotion of free water audits for residents and local businesses		On-going
B	Include information related to PACE district financing options for water-conserving retrofits on Sustain La Mesa webpage; include local success stories that used this financing option to demonstrate what types of improvements are possible		Near-term
C	Establish operational framework for benchmarking, tracking, and reviewing municipal water use at meter level to allow identification of improper irrigation system use, leaks, or other wasteful water activities; incorporate water use reporting into overarching CAP progress reporting procedure (can be linked with annual General Plan implementation reporting procedures)		Near-term

	Action	Responsibility	Timeline
D	Consider establishing municipal water use reduction target to be achieved through employee education, indoor plumbing and appliance retrofits, use of advanced irrigation systems, and installation of additional low-water use landscapes in medians, parks, and around City buildings/facilities		Near-term

Progress Indicators	Year
20% per-capita water use reduction from 2010 baseline use	2020

W-2
WATER SENSITIVE LANDSCAPE DESIGN AND IRRIGATION

Conserve water through efficient landscaping design and irrigation.

Supporting Measure – Not Quantified

The City adopted a model water efficient landscape ordinance (WELO) in 2010, in accordance with AB 325 and the state's requirements for water conservation. The WELO is a comprehensive water conservation and water efficiency policy that requires all development and redevelopment within the Helix Water district to:

- install high-efficiency indoor fixtures, including toilets, dishwashers, clothes washers, and showerheads
- design and install landscaping in compliance with maximum applied water allowances
- install dedicated irrigation meters for outdoor use at all single family homes with over 1 acre of landscaping, and in all parks, common areas, and commercial/industrial/multi-family sites with 5,000 sqft or more of irrigated landscaping
- enroll all new irrigation meters in Helix's water budget program (except for those at single-family homes)
- install weather-based irrigation controllers
- install high-efficiency, matched-precipitation rate sprinkler nozzles

The City is leading by example to reduce outdoor water use on City property through lawn removal projects at City Hall and irrigation system upgrades at all City parks and some landscapes at other City buildings and roadway medians. The City is also developing a graywater education program to help

residents and businesses understand the water-saving opportunities and regulations related to graywater use, which is already allowed under the current Building Code. The Environmental Sustainability Commission developed a graywater brochure that provides an introduction to the concept of graywater use at home which can be shared on the Sustain La Mesa website. The City will also provide educational workshops on graywater systems to environmental groups, gardening clubs, and community-members to further disseminate information and increase use of such systems.

	Action	Responsibility	Timeline
A	Finalize graywater education program and begin hosting workshops with local environmental groups, gardening clubs, and other community organizations, and enlist their help in advertising program and benefits of graywater systems; prepare informational material on graywater system design considerations for Building Division staff to share during the building design and permitting phase; provide links to graywater education program informational materials on Sustain La Mesa webpage		Near-term
B	Monitor ongoing efforts of Helix Water District to source recycled water for retail customers, and include revisions to City's Public Improvement Standards and / or Building Code that would further facilitate installation of "purple pipe" to allow recycled water use within community; consider rules and regulations from neighboring jurisdictions (e.g., City of San Diego) when providing similar local guidance concerning use of recycled water community-wide		Long-term

Solid Waste Strategy

Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper and wood products) is buried in landfills and anaerobic digestion takes place, emitting methane. Additionally, extracting and processing raw materials for consumer products, distributing them to consumers and disposing of them creates GHG emissions. In La Mesa, approximately 9% of GHG emissions are associated with solid waste generation and disposal in landfills.

The zero-waste concept in waste management is a high-level goal of being able to recycle, reuse, or compost all waste products to increase community-wide solid waste diversion efforts above the 90% range. Implementation programs to achieve zero-waste can include community-wide recycling, organics collection (e.g., food scraps, compostable paper), and green design to minimize construction-related waste.

These practices combined can lead to lower landfill-related emissions, and help to extend the useful operating life of local landfills. The measures included within the Solid Waste Strategy provide total GHG emission reduction potential of 525 MT CO_2e/yr in 2020. This represents approximately 3% of total local CAP measure reductions.

SW-1

FOOD SCRAP AND YARD WASTE DIVERSION

Work with local waste hauler to develop residential food scrap and compostable paper collection program.

2020 GHG Reduction Potential: **250 MT CO_2e/yr**

Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins and paper towels are all compostable paper. Diverting these organic items from the landfill helps to reduce methane gas generation from anaerobic decomposition, and helps to prolong the operable life of a landfill. Composting of organic materials, such as food, is one method of managing these materials and diverting them from landfills.

The City already offers a backyard composting program through which residents can purchase discounted bins. In addition to this effort, the City will work with its franchise waste hauler to develop and implement a residential food scrap and compostable paper collection program that could expand participation in diverting these additional organic materials. These programs often use residents' green waste collection bins to transport all green waste to area composting facilities. To increase use of such

diversion programs over the long-term, the City will continue to partner with regional agencies to develop education programs for integration into classroom curriculum. The City will also explore opportunities to develop a commercial food scrap collection pilot program with the local business community. Existing models in San Diego and other jurisdictions can be reviewed for best practices of implementation success.

Action		Responsibility	Timeline
A	Discuss opportunities with franchise waste hauler to add residential food scrap collection services to City's waste collection contract		Medium-term
B	Work with franchise waste hauler to promote use of green waste bins for organic waste collection through public outreach campaign that explains what items can be collected and benefits of green waste recycling; work with "I Love a Clean San Diego" to incorporate information on new organic waste collection program into their on-going classroom curriculum		Long-term
C	Include links to franchise waste haulers page on Sustain La Mesa webpage or include list of compostable food scraps and paper products that can be collected in green waste bins		Medium-term
D	Explore opportunities with franchise waste hauler, local Chamber of Commerce, and other local business organizations to develop and encourage participation in voluntary commercial food scrap collection pilot program; include representatives from San Diego's Environmental Services Department during strategic planning phase to learn from their similar program experience, including technical assistance on collection bin storage / placement and barriers to participation; pilot program could target large local generators of food scraps, such as hotels, restaurants, schools, and grocery stores / markets		Long-term

Progress Indicators	Year
Households divert 5% of food scraps and compostable paper; Households and businesses divert 85% of yard waste	2020

SW-2

CONSTRUCTION & DEMOLITION WASTE DIVERSION PROGRAM

Continue to enforce the City's construction and demolition waste diversion ordinance.

2020 GHG Reduction Potential: **275 MT CO2e/yr**

According to the California Department of Resources Recycling and Recovery (CalRecycle) 2008 Statewide Waste Characterization Study, construction and demolition (C&D) materials account for almost

29% of the waste stream in California. Scrap lumber composes nearly 15% of the statewide total. Lumber is an organic material, and therefore generates methane emissions through anaerobic decomposition in a landfill. Reusing and recycling C&D materials conserves natural resources and diverts material from landfills, reducing GHG emissions and conserving landfill capacity. Many other construction materials can also be diverted from the waste stream for reuse or recycling, including concrete and asphalt, bricks, scrap metal, and drywall.

The California Green Building Code requires the diversion of at least 50% of construction waste materials generated during most new construction, including all new residential and commercial projects. The City of La Mesa increased its diversion rate requirement to 75% when a recycling facility accepting mixed C&D debris began operation in the San Diego region. The City also requires a C&D diversion deposit prior to issuing building permits, which further increases implementation of this strategy. A deposit is paid to the City prior to issuance of building permits, and refunded to applicants following submittal and approval of the applicable waste diversion documentation. Alternatively, applicants can provide a signed contract with an authorized C&D collector in lieu of deposit payment. Deposit rates are calculated based on project type and size.

To maintain its high level of C&D waste diversion from landfills, the City will continue to enforce its diversion ordinance and implement its deposit program. As the City nears full build out of vacant lots, it may become necessary to revise the C&D ordinance to address smaller renovation projects than the current 1,000 square feet threshold (e.g., 500 square feet). The City should also continue to participate in regional discussions regarding solid waste diversion efforts in the San Diego area, and consider the efforts of neighboring jurisdictions when planning revisions to La Mesa's requirements.

Action		Responsibility	Timeline
A	Continue to implement City's 75% C&D diversion requirement for applicable projects as defined in City's Construction and Demolition Debris Diversion Ordinance; continue to enforce C&D Debris Diversion Deposit Program to help implement diversion ordinance		On-going
B	Participate in regional waste diversion discussions and monitor mandatory participation levels in other area C&D diversion ordinances; consider revisions to City's diversion requirements to address smaller renovation projects		Long-term

Progress Indicators	Year
Projects divert 75% of construction and demolition waste, per City's ordinance	2020

Green Infrastructure Strategy

Green space consists of a variety of places that, when integrated within an urban environment, provide valuable recreation and health services to the community. In La Mesa, green space includes the urban forest, parks, landscaped medians and parkways, and natural stormwater-absorbing landscapes. Healthy and robust green infrastructure systems can mitigate the urban heat island effect, lower building energy use, provide natural stormwater management and wildlife habitat, improve local air quality, and increase community pride.

As one component of the green infrastructure network, urban forests provide shade and can reduce the heat island effect, which causes temperatures to increase in areas with concentrations of exposed pavement and rooftops. These higher temperatures can lead to increased air conditioner use, which increases energy consumption and can strain utility infrastructure at peak hours of the day. Urban forests also provide a visual amenity for residents and habitat value for wildlife.

The City recognizes various beneficial aspects of trees. Trees beautify neighborhoods, increase property values, reduce noise and air pollution, and create privacy. Additionally, trees gain carbon-sequestering biomass in their trunks and roots as they absorb carbon dioxide from the air to grow. The measure in this section seeks to enhance La Mesa's already well-established urban forest through partnerships with residents, businesses, and community and neighborhood groups.

The total GHG emission reduction potential of the Green Infrastructure Strategy is 45 MT CO_2e/yr in 2020. This represents less than 1% of total 2020 reductions anticipated from local CAP measure implementation. As the trees described in the following measure continue to grow and increase their carbon sequestration potential, the impact of this measure will also increase to provide greater reductions in future CAP updates.

GI-1

URBAN FOREST MASTER PLAN

Support natural carbon sequestration opportunities through continued development and maintenance of a healthy, vibrant urban forest.

2020 GHG Reduction Potential: **45 MT CO_2e/yr**

The urban forest contributes to La Mesa's quality of life and attractiveness as a place to live, work, and visit. Trees play a valuable role in the identity of a city by strengthening a community's image, encouraging pedestrian activity, and developing inviting public and private spaces. Trees also perform important environmental functions, such as removing air and water pollutants, providing wildlife habitat, and capturing carbon dioxide from the atmosphere. Urban forests that include street trees can also provide shade to roadways and other paved areas to reduce the heat island effect.

Facilitating the development of vibrant green spaces and urban landscaping is an important goal for the City. The General Plan Land Use and Urban Design Element encourages use of greenery in design, and La Mesa has been recognized as a Tree City, USA since 1980. The City is also a participant in the San Diego County Tree Inventory program, which provides interactive maps to quantify the ecological and economic benefits of trees.

Recognizing the importance of maintaining and enhancing a healthy urban forest, the City will partner with existing neighborhood groups and organizations to encourage additional voluntary tree planting within the community. The City will host an educational workshop to assist residents with species selection and planting guidance to maximize building shading and minimize damage to underground utilities and pavement. The City will also continue to implement its existing landscaping requirements to integrate shading within parking lots to reduce local urban heat island impacts, as well as implement landscaping requirements at municipal facilities. To guide the long-term development and health of the City's urban forest, staff will consider developing an Urban Forest Master Plan or participating in future regional efforts to develop such a strategy. Such plans should consider the potential long-term impacts associated with climate change when making recommendations on suitable tree species and planting strategies, particularly in consideration of watering requirements to maintain a healthy tree network.

	Action	Responsibility	Timeline
A	Continue to implement and support polices outlined in Tree Policy Manual for City departments, including landscaping requirements for new municipal facilities, parking lots, and public rights-of-way		On-going
B	Continue to implement City's design standards for parking lot shade trees; consult with neighboring jurisdictions on best practices to monitor and enforce parking lot shade requirements with minimal staff resources		On-going
C	Partner with neighborhood groups, community organizations, and local business community to encourage voluntary tree planting on private property within La Mesa; host Urban Forestry workshop and invite representatives from SDG&E and Public Works staff to provide technical assistance regarding appropriate species selection, proper siting and safe planting practices, and strategies to avoid damage to sidewalks, driveways, and underground utilities		Long-term
D	Consider developing Urban Forest Master Plan to serve as strategic, long-range guide to proactively grow, improve, and manage City's urban forest		Long-term

Progress Indicators	Year
500 net new trees planted in the community from 2015 onward	2020

CAP Implementation Strategies

In addition to the previous five strategy sections that focused on emissions reduction opportunities, this section presents two measures to assist in CAP implementation. La Mesa is one of many local governments in the San Diego region that is taking steps to address climate change through local policy development. It is likely that many of the measures described in this CAP have strong overlap with similar emissions reduction strategies from other cities, and could benefit from a collaborative implementation approach. The City will also need to monitor the implementation success of its CAP strategies and statewide actions to ensure local emissions are decreasing as estimated throughout this chapter.

I-1
REGIONAL IMPLEMENTATION PARTNERSHIPS

Participate in regional partnerships aimed at collaborative implementation of specific CAP strategies or other emissions reduction efforts.

Supporting Measure – Not Quantified

Various measures presented above could provide opportunities for regional collaboration on implementation, either through shared outreach strategies, regional funding and procurement programs, or long-term regional planning efforts. This regional approach could provide implementation efficiencies and facilitate discussion of best practices among local governments regarding emissions reduction strategies. The reduction measures presented throughout this chapter identify numerous implementing actions, some of which can be undertaken locally without need for additional partnerships and others that would benefit from different types of collaboration. The following sections identify collaborative opportunities for outreach and education, funding and finance, and long-term planning among the CAP's measures. Not all measures are represented since some can be fully implemented independently by City staff, while some are shown in multiple lists because different implementing actions could be pursued through the regional approaches discussed below.

Outreach and Education Campaigns

Community engagement and effective participation are essential to the successful implementation of this CAP. During the CAP implementation period, the City will conduct outreach programs that involve residents and businesses in various activities. Because this CAP is designed to leverage the voluntary actions of La Mesa's residents and businesses, outreach and informational campaigns explaining the benefits of action will play an integral role in implementation success.

Effective public participation will increase the likelihood that the measures recommended in this plan achieve their estimated participation rates. Furthermore, La Mesa will see higher participation rates if

outreach and education programs are adapted over time to meet the changing needs of the community. Increased participation rates will result in increased emissions reductions.

While this CAP was developed to respond to local conditions and opportunities for action, the measures presented throughout likely share strong overlap with the emissions reduction activities or other communities in the region. To the extent that other local governments are developing and implementing outreach campaigns to drive participation in similar CAP program, there may be opportunities to share program costs and leverage existing informational materials, rather than create duplicative programs in La Mesa. For example, other area cities are encouraging the installation of roof-top solar PV systems in their communities. La Mesa could partner with these other jurisdictions to develop a comprehensive outreach and education program, and collectively learn from others implementation successes and challenges. Collaborative opportunities in outreach implementation may be found among the following CAP measures:

- E-1 Building Retrofit Outreach
- E-2 Shade Tree Outreach
- E-5 Parking Lot Lighting
- E-6 Solar Photovoltaic Outreach
- E-7 Solar Hot Water Outreach
- T-2 Bicycle Safety Outreach
- T-3 Transportation Demand Management Program
- W-1 Urban Water Management Plan Programs
- SW-1 Food Scrap and Compostable Paper Diversion

Program Funding and Finance Opportunities

- Several CAP strategies recommend expensive investment in infrastructure or equipment. As described in the measure descriptions in this chapter, regional financing programs or bulk procurement strategies could help to defray costs associated with the following CAP measures:
- E-3 Municipal Energy Efficiency Goal
- T-5 Alternative Refueling Infrastructure Development
- T-6 Municipal Fleet Transition

Long-Term Regional Planning Partnerships

Some strategies would benefit from a regional approach in ordinance development and implementation, long-term planning programs, or knowledge sharing on past successes and potential challenges to various issues. SANDAG already acts as facilitator on various regional topics. If enough interest exists, additional topics could be explored through a similar process, or other regional platforms, such as the San Diego Regional Climate Collaborative, could be explored depending on the subject area. For example, developing a regional urban forest strategy may be best pursued through a framework similar to the San Diego County Tree Inventory program. The following CAP measures could be elevated for discussion and action at the regional level:

- T-1 Bicycle and Pedestrian Infrastructure Development
- T-4 Mixed-Use and Transit-Oriented Development
- T-5 Alternative Refueling Infrastructure Development
- SW-2 Construction and Demolition Waste Diversion
- GI-1 Urban Forest Management

Following adoption of the CAP, City staff will prioritize measures for implementation and consider which should be pursued through a regional approach. This will require an understanding of other climate change planning initiatives underway among area jurisdictions, as well as their implementation strategies. SANDAG could provide a platform for these cooperative efforts, and facilitate prioritization of regional emissions reduction actions and programs.

	Action	Responsibility	Timeline
A	Collaborate with other local governments and SANDAG during CAP implementation phase to identify programmatic overlap among various CAP measures or sustainability strategies that could benefit from comprehensive regional approach; for example, building retrofit outreach programs would be very similar from one San Diego County city to another, allowing joint development of one program using shared resources		Near-term
B	Partner with other San Diego County governments, possibly through SANDAG-led approach, to prioritize regional sustainability issues and programs for joint implementation		Near-term

I-2
CAP IMPLEMENTATION AND MONITORING

Establish monitoring and reporting frameworks to keep CAP document relevant and actionable

Supporting Measure – Not Quantified

The CAP is based on numerous assumptions and the best data available at the time of its preparation. However, those assumptions may prove to be inaccurate, which could skew the emissions growth forecasts or influence the emissions reduction estimates presented in this plan. Therefore, the CAP should be treated as a living document and monitored and revised on a regular basis – currently anticipated to be every five years. The CAP will need to be updated to accurately reflect La Mesa's role in climate change planning as the state further implements its own emissions reduction actions, new data becomes available for analysis, and additional emissions reduction technologies and strategies are

developed. Additionally, the City of La Mesa has received recognition from the Beacon Award Program for its climate efforts. The Beacon Award Program, sponsored by the Institute for Local Government (ILG) and the Statewide Energy Efficiency Collaborative, is a statewide program recognizing California cities and counties that are working to reduce GHG emissions, save energy, and adopt policies and programs that promote sustainability. To participate in the Program, the City must continue to provide ILG with its GHG reduction activities to achieve higher recognition.

It is likely that the state will continue to develop actions and programs that will support achievement of its 2050 statewide reduction target, such as development and implementation of zero-net energy building requirements. However, at this time the potential future impact of those actions is unknown. Therefore, the City will continue to monitor the state's efforts designed to achieve its long-term 2050 reduction target. Should additional statewide actions be developed, or existing actions enhanced, that would have local application to La Mesa, then the City will analyze their local reduction potential and incorporate those reductions into future CAP updates. Statewide or regional agencies may provide guidance on how to estimate the local effect of these new or enhanced statewide actions. Alternatively, the City could learn how to assess this new information from neighboring jurisdictions as they pursue CAP updates of their own.

The uncertainty regarding the future impact of statewide actions is only one of several variables that could influence the City's ability to achieve its longer-term targets. New technologies that further reduce energy or transportation-related emissions (e.g., more efficient appliance standards, fuel-efficient vehicles) may be developed after the City's 2020 target year. Further, existing technologies may also become more effective or financially viable, which could accelerate their purchase and use within the community. One example is the cost and ubiquity of solar photovoltaic panels, which have experienced exponential market growth during the last few decades. To that end, increased residential and commercial renewable energy deployment could be a large source of future emissions reductions, when compared to current conventional grid-sourced energy resources.

Additional local CAP measures and longer-term reduction targets may also be developed during future plan updates. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the City to identify emissions sectors that need additional attention. They will also help to demonstrate that the City remains on a trajectory consistent with the state's long-term emissions reduction targets.

Similarly, future emissions levels are based on numerous growth estimates, including future year population and employment levels envisioned in the General Plan. If the City grows faster than anticipated in the emissions inventories, it will become harder to achieve future targets without deeper implementation of CAP measures (or development of new ones). However, if the City grows more slowly, so too will its emissions; potentially making future targets easier to achieve through implementation of this CAP. All of these uncertainties illustrate the need for regular monitoring and revisions to the CAP, the City's emissions inventories, and reduction strategies. See Chapter 4 for further discussion of how the City should ensure the CAP's relevance in the future.

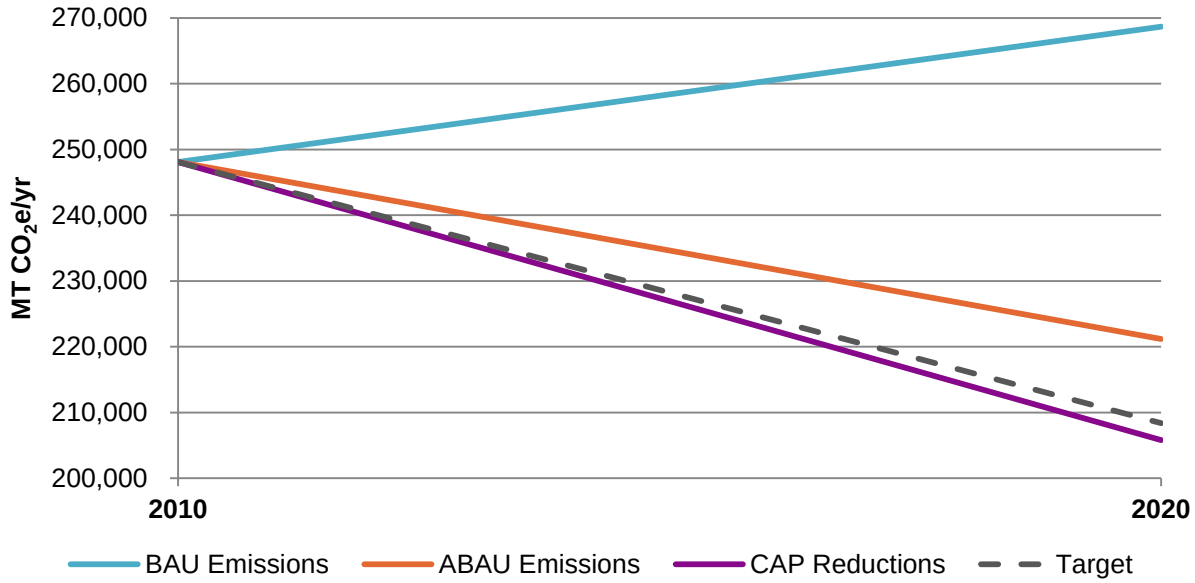
	Action	Responsibility	Timeline
A	Monitor overall emissions trajectory through regular inventory updates; prepare emissions inventory updates on 5-year cycle to ensure real progress is being made towards the reduction target(s); establish procedures for collecting relevant data to be included in inventory updates, and follow prevailing emissions inventorying methodologies (attempt to make inventories directly comparable to one another, though evolving technical methodologies may make this difficult)		Long-term
B	Develop process for updating statewide reduction estimates as part of future inventory updates to show actual emissions levels achieved; if discrepancy is discovered between actual reduction results and estimated levels described in CAP due to fewer reductions from statewide actions, identify which statewide actions are not performing optimally and strengthen related local CAP measures or develop new local actions to close reductions gap		Long-term
C	Monitor individual measure progress to identify opportunities to strengthen underperforming measures (i.e., those not on track to achieve their CAP-estimated reductions), or further enhance high-performing measures		Long-term
D	Prepare annual CAP implementation reports to be shared with City Council and posted on Sustain La Mesa webpage to highlight achievements made, track progress towards reduction goals, identify barriers to implementation, and plan for inventory and CAP updates		Near-term
E	Amend CAP every 5 years to reflect inventory and projection updates, measure revisions or additions, and identified pathway towards achievement of future targets		Long-term

Target Achievement

PROGRESS TOWARD 2020 TARGET

The local reduction measures described above, combined with the statewide actions presented in Chapter 2, are estimated to reduce community-wide emissions by 62,905 MT CO_2e/yr from projected 2020 levels. This would **exceed** the City's 2020 reduction target of 16% below 2010 levels, representing a 17% reduction in baseline emissions. Figure 3.1 shows the additive impact of statewide actions and local actions that will achieve the City's 2020 target.

Figure 3.1 – Target Achievement – 2020



Long-Term Emissions Planning

This CAP currently focuses on achievement of a near-term 2020 reduction target. However, as described in Chapter 1, the state has established a longer-term reduction target of 80% below 1990 levels by 2050, and local governments will be integral partners in its achievement. To that end, some jurisdictions have started taking a long-term view of their emissions contributions and reduction opportunities. As part of future CAP updates, the City will prepare long-range emissions forecasts (e.g., 2035, 2050), and adopt additional reduction targets that align with the state's emissions goals.

Based on the target-setting rationale presented in Chapter 2, the City's 2020 target would approximate a return to 1990 emissions levels. If the state's goal is to reduce emissions to 80% below 1990 levels by 2050, then the following local targets would mirror those efforts in La Mesa:

- **2035** – 50% below 2010 levels (i.e., 125,029 MT CO_2e/yr)
- **2050** – 83% below 2010 levels (i.e., 41,676 MT CO_2e/yr)

The CAP currently only forecasts emissions through 2020, so the total reductions needed to achieve these targets are not yet known. However, several variables will influence the City's ability to achieve future longer-term targets. First, the continued impact of statewide actions is unknown, as described in the following section. Second, new technologies that support additional emissions reduction may be developed between now and future targets years. Existing technologies may also become more effective or financially viable for increased implementation. For example, the prevalence of solar photovoltaic panels may continue to increase greatly as costs are projected to continually fall. Similarly, solar hot water systems may become increasingly viable options if system costs experience the same downward trend as solar PV panels did over the previous decades. Increased renewable energy development could be a large source of future emissions reductions.

Third, additional local CAP measures may be developed during future plan updates, or CAP measures may be implemented at higher rates than previously estimated. The 2020 reduction estimates are based on the best available data and assumptions, but the future is difficult to predict accurately. Regular emissions inventory updates will be the best predictor of future target achievement, and will help the City to identify emissions sectors that need additional attention.

Fourth, and final, future target achievement is based on numerous growth estimates, which may not exactly reflect reality. If the City's emissions grow faster than anticipated in the forecasts, it will become harder to achieve long-term targets without deeper implementation of CAP measures. Conversely, if growth in La Mesa is slower than anticipated in the CAP, then emissions growth will likely be lower than estimated, potentially making future targets easier to achieve.

The following sections broadly consider the future role of reduction measures at the statewide and local level.

Future Statewide Action

At the time of CAP preparation, ARB only provided statewide reductions estimates associated with implementation of the Scoping Plan through horizon year 2020. However, it is likely that additional statewide action will be taken to further reduce emissions in order to achieve the state's 2050 reduction

target, and that these additional actions would continue to play the primary role in local target achievement, as is demonstrated earlier in this chapter.

While the precise impact of future statewide actions is currently unknown, it could be assumed that they will continue to provide the same level of reduction impact at the community-wide level for local CAP planning purposes. That is, if statewide actions are estimated to provide approximately 79% of reductions needed for local target achievement by 2020 (as is the case in La Mesa), then it could be assumed that statewide actions would provide a comparable proportion of reductions needed in future target years as well. As with this current version of the CAP, the City will need to consider the precise role of future statewide actions during CAP updates to identify the remaining local need and opportunities for action.

FUTURE LOCAL ACTION

Many jurisdictions find that planning for long-term emissions reductions needs to incorporate the expansion of near-term strategies, such as those described throughout this chapter, combined with the development of additional long-term strategies. It is also likely that to achieve the deep emissions reductions suggested in the future targets above, aggressive implementation programs and long-term infrastructure investments will be necessary to greatly increase efficiency within La Mesa. For example, transportation and land use strategies could provide long-term VMT reductions if regional multi-modal transportation options are fully developed to allow practical and convenient alternatives to single occupancy vehicle trips. Regional collaboration and planning on longer-term programs like this can provide implementation efficiencies that reduce program costs and minimize redundancies in program development across multiple jurisdictions. These partnerships can also leverage the region's knowledge, experience, and financial capacity to deliver climate planning solutions that would be impractical at the individual city level.

This CAP serves as a starting point for climate planning in La Mesa, and provides a framework for additional analysis and refinement through future plan updates. Chapter 4 expands on this concept with consideration for evaluating implementation success, refining reduction strategies, sharing progress updates with the public, and expanding the scope beyond the 2020 target year.

CHAPTER 4

Benchmarks and Implementation

This chapter describes how the City will implement CAP emissions reduction measures and actions in the following sections:

- **Implementation and Monitoring:** describes how City staff will implement CAP measures and related actions, and track the performance metrics identified for each measure.
- **Plan Evaluation and Evolution:** discusses the need to evaluate, update, and amend the CAP over time, so the plan remains effective and current.

Implementation and Monitoring

Ensuring that the CAP strategies translate from this document into on-the-ground results is critical to the success of the plan and the City reaching its 2020 emissions reduction target. To facilitate this, each measure described in Chapter 3 contains an associated table that identifies the measure's estimated greenhouse gas reduction potential in 2020, implementation actions that help to achieve those reduction levels, departments responsible for implementing those actions, and performance indicators used to quantify emissions reductions (where applicable).

These tables enable City staff, the City Council, and the public to track measure implementation and monitor overall CAP implementation progress. The 2020 performance indicators are especially important, as they provide a checkpoint to evaluate if a measure is on target to achieving its anticipated emission reductions, and provide a framework from which the City can expand its CAP efforts in the future.

Each measure's estimated GHG emissions reductions are based on the corresponding performance indicators, which will help City staff track progress toward the GHG reduction targets. For example, Measure E-6 (shown in Table 4.1 on the following page) focuses on the installation of renewable energy

systems. The measure's estimated GHG emissions reductions are based on various assumptions, including the generation capacity of additional solar photovoltaic systems to be installed community-wide by the 2020 target year. The 2020 performance goals are based on installation of approximately 6.13 MW of photovoltaic (PV) capacity, including the previously installed 3.8 MW of solar capacity. If the City is able to install more renewable energy capacity than estimated in this measure, additional emissions reductions will occur. Likewise, if the amount of renewable energy installed is less than the amount indicated in the performance indicator, then this measure will achieve less than its stated GHG reductions.

Upon adoption of the CAP, the City departments identified in the implementation tables shown in Chapter 3 will have responsibility for investigating or implementing their assigned actions. To assess the status of CAP efforts, implementation meetings should take place on a regular basis. Some actions will require inter-departmental cooperation or development of additional regional partnerships.

Table 4.1
Measure Implementation Tracking Template

E-6 Solar Photovoltaic Outreach Program

Promote the voluntary installation of solar PV systems on residential and nonresidential buildings.

	Actions	Department and Division Responsible	Phasing
A.	Review / revise all applicable building, zoning, and other codes and ordinances to identify potential regulatory barriers to installation of solar PVs in residential and nonresidential construction; work to remove identified barriers	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)
B.	Explore opportunities to streamline permitting process (e.g., building, electric, plumbing) for solar PV systems or reduce solar permitting fees; train Building Department counter staff in City's solar permitting process to assist community members process	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)
C.	Work with SDG&E, PACE districts, and neighboring jurisdictions to develop a comprehensive outreach campaign to increase voluntary participation in solar PV installation programs, including directory of existing rebates / incentive programs, explanation of simple-payback calculations for solar PV systems, and technical assistance; leverage existing solar PV informational materials from CSE, California Solar Initiative, SDG&E, and other organizations	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)
D.	Identify local solar service providers offering power purchase agreements (PPAs), and convene a roundtable discussion with service providers and local Chamber of Commerce representatives who can disseminate discussion information among area businesses	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)

Table 4.1
Measure Implementation Tracking Template

E-6 Solar Photovoltaic Outreach Program

Promote the voluntary installation of solar PV systems on residential and nonresidential buildings.

	Actions	Department and Division Responsible	Phasing
E.	Provide training to Planning Department and Building Division counter staff regarding available sources for rebates / financing/incentives, as well as printed pamphlets or FAQ sheets for distribution to customers seeking permits for new construction or major renovation projects; provides links to similar information on Sustain La Mesa webpage	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)
F.	Identify opportunity sites on City buildings or parking lots for municipal solar PV installation; partner with CSE to investigate interest in pursuing regional renewable energy procurement program with other area governments and public agencies	Department, Division	Establish a target date or timeframe for Implementing each action, (e.g., September 2015, Fall 2015, or FY 15/16)

Performance Indicator	Year
▪ 6.13 MW solar capacity installed community-wide since 2010 baseline year; systems generate approximately 11 million kWh/yr	2020

Tracking Mechanisms

- Collect installation data annually from California Solar Initiative, SDG&E, and/or City permit data; analyze to gauge progress toward goals:
- Examples:
- What was the total installed generation capacity (in kW or MW) of new photovoltaic systems?
- How many kWh/yr of electricity are generated from the photovoltaic systems (empirical data to be collected from utility accounts)?
- What is average annual capacity to be installed to achieve performance indicator?

Progress Made (e.g., “x” kW of new capacity installed; “x” kWh/yr generated)	Year
	2015
	2016
	2017
	2018
	2019
	2020

Plan Evaluation and Evolution

This CAP represents the City's first plan to reduce community-wide GHG emissions in alignment with an adopted reduction target. Staff will need to evaluate the plan's performance over time and be ready to make alterations if it is not achieving its stated target.

Plan Evaluation: Ongoing Monitoring for Continued Success

Two types of performance evaluation are important: (a) evaluation of the City's overall ability to reduce GHG emissions, and (b) evaluation of the performance of individual CAP measures. Future emissions inventory updates will provide the best indication of CAP effectiveness. Conducting these inventories periodically will enable direct comparison to the 2010 baseline inventory and measurement of progress toward meeting the City's adopted reduction target.

While GHG inventories provide information about overall emission reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction progress of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The City can reinforce successful measures and reevaluate or replace under-performing ones.

To track measure performance, City staff will need to collect important data that are related to the performance indicators shown in the measure tables. While much of the data is already available from existing reports or processes, some improvements in data collection will be needed. It is therefore important that staff from relevant departments establish methods of data collection in a consistent, simplified, and ideally, centralized way. The implementation tables from Chapter 3 can be collected in a consolidated document to serve as a CAP Implementation Tracking Framework. Table 4.1 (presented above) presents a sample of how this framework could be formatted, and shows the types of information that will need to be collected in order for the City to monitor and track measure implementation progress.

Similar to the implementation tables, Table 4.1 presents a measure and its corresponding actions. It also provides a space to designate responsibility for individual actions (at the department level or individual staff assignments), establish phasing timelines, and track important data related to the performance indicator. The Phasing column allows each responsible department to identify internal timelines for implementing specific action steps, which could be expressed as specific target years or more generally as short-, medium-, and long-term actions. The Tracking Mechanisms specify how implementation of the Performance Indicators will be monitored. The Performance Indicators should be evaluated regularly to ensure each measure is on track to achieve its stated emissions reductions. The table provides a space for annual progress reviews and note taking for relevant pieces of data.

If during the implementation review process a measure is found to be falling short of its performance goals, then additional attention can be given to modifying the implementation actions. Further, if implementation review indicates that a measure will be unable to achieve its stated reduction level, then new CAP measures would need to be developed to make up the difference, or other existing measures could be enhanced to increase their emissions reduction potential. CAP implementation should be an iterative process to reflect future changes in technology, available budget, and staff resources. City staff will use the Implementation Tracking Framework described above to develop a performance tracking system that covers each CAP measure and action.

Designated staff will evaluate measure performance on an annual basis. A CAP implementation summary report that outlines progress towards the measures and actions should also be prepared. The report could cover areas such as estimated GHG emissions reductions to date, progress towards the next reduction target (should the City choose to establish longer-term targets as well), progress towards implementation of the actions, achievement of measure performance indicators, implementation challenges, and recommended next steps. Staff may want to deliver this report in conjunction with the state-required annual report to the City Council regarding implementation of the City's General Plan.

PLAN EVOLUTION: ADAPTING FOR CONTINUOUS IMPROVEMENT

For it to remain relevant, the CAP also needs to be adapted over time. It is likely that new GHG reduction technologies and strategies will be developed, new financing mechanisms will be available, and state and federal legislation will change. It is also possible that future GHG emission inventories will indicate that the City is not on track toward achieving its adopted GHG reduction target. If this is the case, the City can assess the implications of new scientific findings, explore new emission reduction technologies, respond to changes in state and federal climate change policy, and modify the CAP accordingly to help get back on track toward meeting the adopted GHG target.

Following the 2020 CAP target year, the City should also establish long-term reduction targets and begin to define the priority measures and implementation action steps that it will pursue to help achieve those targets. This process should begin with preparation of a 2020 emissions inventory that can be used to compare progress made since the 2010 baseline inventory. The updated inventory will also be helpful in identifying priorities for new City actions. The City can refer to the reduction strategies included within this CAP for guidance on the types of strategies that should be considered in future CAP revisions. However, it will be important to consider the City's current emissions inventory, ongoing City actions, new state legislation, and emerging technologies to define the specific pathway towards achieving the next emissions reduction target.

Inventory Updates

As mentioned throughout this document, the City's ability to track implementation success is best achieved through regular emissions inventory updates. Per Measure I-2, the CAP recommends inventory updates to occur every 5 years, beginning with the 2020 target year. These updates will allow the City to compare its actual future emissions levels to those forecasted in Chapter 2, and track the long-term trajectory of the City's emissions. As part of the future inventorying process, the City should also develop a procedure to share this new information with the public and City Council, report on progress made towards the next target, and compare the updated inventories to previous estimates presented in this CAP. Inventory updates should be coordinated with broader CAP updates as well.

There are various challenges inherent when inventorying emissions, which can make it difficult to allow for direct comparisons from one inventory year to the next. For example, the state of the climate science industry is perpetually advancing and shifting, leading to revisions in inventory methodologies. Similarly, the emissions factors upon which inventories are developed are constantly being refined by various agencies and entities (e.g., California Air Resources Board, International Panel on Climate Change). There are also instances in the inventory process where judgment calls must be made in order to interpret and apply the best available data at the time. While The Climate Registry (TCR) and ICLEI have developed guidance on how communities should prepare their inventories, inconsistencies can arise and practitioners do have nuanced approaches to applying this guidance.

In order to best position itself to produce future inventories that can be compared to past inventories with relative consistency, the City should continue to develop its institutional knowledge in the area of emissions generation sources, reduction opportunities, and emissions inventory variables. Whether through a strong leadership role in preparing its own updates (possibly using ICLEI's online resources) or through a partnership with other area jurisdictions, the City should remain engaged in the inventorying process so that City staff can provide a level of consistency from one update period to the next.

Revisions to Statewide Actions

Updates to statewide reduction estimates will need to consider revised quantification methodologies as well as updated underlying activity data estimates. The following sections describe the considerations for updating the statewide actions presented in this CAP during future plan and inventory updates. At the time of future inventory updates, a variety of actions could be occurring or have already occurred that would affect local GHG reductions, including new statewide actions being implemented, termination or completion of previous statewide actions, or expansion of existing actions. The City can work with regional partners, as described in Measure I-1, and with an updated understanding of statewide actions, as described in Measure I-2, to determine the appropriate methodology for estimating reductions from new or expanded statewide actions and these actions might best coordinate with reduction strategies coordinated with regional partners.

Renewable Portfolio Standard

The RPS reductions were calculated based on estimates of future electricity consumption, SDG&E's assumed compliance with the legislation, and an estimated future electricity emissions factor based on the remaining non-renewable portion of SDG&E's electricity portfolio. Any one of these variables could influence the actual reductions achieved from implementation of this action. If future electricity consumption is greater than anticipated, then reductions from this action would increase, but total inventory emissions would also increase requiring a larger reduction to achieve the same target. If SDG&E does not achieve the RPS requirements, then actual reductions would likely be lower since electricity would presumably be more carbon-intensive than anticipated under the RPS program. Similarly, the RPS only affects 33% the electricity portfolio. The remaining 67% could come from a variety of sources, including emissions-free (e.g., large-scale hydro) and emissions-intensive (e.g., coal-fired power plants) sources. The actual composition of the electricity portfolio will determine its associated emissions factor, and therefore, the reduction potential of this action.

The current iteration of RPS legislation is to be achieved by 2020. Emissions inventory updates occurring after that year will already incorporate reductions associated with its implementation. Therefore, RPS estimates would not need to be revised and shown separately in future CAP updates (as they were through the ABAU emissions forecasts in Chapter 2). However, should the state revise the RPS to require higher levels of renewable energy within utilities' portfolios, it may be possible to estimate additional local reductions resulting from that action. Similarly, if SDG&E were to proactively increase its renewable portfolio independent of statewide requirements, additional local reductions would be possible. The City's future CAP update team should analyze the prevailing statewide initiatives regarding utility portfolios at the time of inventory and CAP updates to determine which, if any, statewide actions should be included as standalone reduction items.

AB 1109

The AB 1109 Lighting Efficiency Program is quantified in this CAP to estimate the electricity reductions associated with full implementation of this program, which is expected to occur by 2018.[1] Therefore, future inventory updates that occur after 2018 should already reflect the emissions reductions associated with this action (i.e., reduced building electricity use from incorporation of higher-efficiency lighting), and would not need to be calculated separately. As with the RPS, if the state decides to further increase lighting efficiency requirements, it may be possible to quantify the additional reductions that would be attributed to this action. The City should work with regional partners or future CAP update teams to determine if it is appropriate and feasible to estimate additional reductions from such an action.

Statewide Vehicle Actions

The vehicle-related statewide reductions included in this CAP (i.e., Pavley I and II, Low-Carbon Fuel Standard, and Heavy-Duty Vehicle Aerodynamic Efficiency Regulations) are based on VMT estimates for La Mesa from the traffic model underpinning its General Plan Land Use plan, county-wide vehicle emissions factors, and statewide emissions reduction potential estimates from the Scoping Plan. As with the Renewable Portfolio Standard (RPS), if any of these factors are changed, the associated emissions reductions will also change. Further, some of these regulations are also planned for full implementation prior to the CAP's 2020 target year, and therefore should be reflected within future inventory updates without the need for separate quantification.

Pavley I established emissions standards for passenger vehicles between the model years 2012 to 2016. Therefore, by the 2020 target year, the community-wide vehicle fleet will have already incorporated these model years and their respective emission rates. County-wide emissions factors that reflect implementation of this action should be available for use in transportation sector emissions updates. Therefore, updates to the CAP's Pavley I reduction estimates would not be necessary.

The Low-Carbon Fuel Standard established targets to reduce carbon intensity of California's transportation fuels by at least 10% by 2020. Similarly, the Heavy Duty Vehicle Aerodynamic Efficiency Regulations has an implementation timeframe of 2011 to 2020. As with Pavley I, future county-wide emissions factors will incorporate the emissions reductions associated with these actions, and separate evaluation of their impact will not be necessary in future CAP or inventory updates.

Lastly, Pavley II would affect emissions standards for passenger vehicles between the model years of 2017 to 2025. Therefore, the emissions reductions associated with this action would continue to increase beyond the 2020 target year, and would not be fully reflected in a 2020 inventory update. A similar methodology used to estimate the Pavley II reductions in this CAP should be used during the City's 2020 inventory update. If this action is implemented according to its current schedule, its associated reductions would be fully reflected in a 2025 inventory update.

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[1] Estimated residential electricity use in the 2020 horizon year was assumed to be reduced by 11.0% over baseline levels and commercial electricity use in the 2010 baseline year was reduced by 8.6% to calculate total kWh savings from implementation of the AB 1109 program. Total electricity savings were then multiplied by an RPS-compliant electricity emissions factor to estimate emissions reductions resulting from this program, and avoid double-counting with the RPS reduction calculations. Electricity savings estimates were found in the CEC's draft report *Achieving Energy Savings in California Buildings,* July 2011, as well as a technical report prepared for the CEC by Itron, Inc. titled *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast: Attachment A: Technical Report,* January 2010.

Based on future technological advancements, the state could decide to increase vehicle-related emissions requirements through new legislation or Scoping Plan updates. As with the other statewide actions, the City should work with its regional partners and CAP update teams to determine if separate quantification of statewide actions is feasible to demonstrate an accurate and complete accounting of local emissions reduction sources.

Notes

[i] State CEQA Guidelines, Section 15183.5(b)(2)

[ii] International Panel on Climate Change. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007*. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html.

[iii] Countywide emissions from the Energy Policy Initiatives Center, University of San Diego School of Law. 2013 (March). San Diego County Updated Greenhouse Gas Inventory. Population data from the California Department of Finance. 2014. Population and Housing Estimates for Cities, Counties, and the State, January 1, 2011-2014, with 2010 Benchmark.

[iv] California Air Resources Board. *Climate Change Scoping Plan: a Framework for Change.* December 2008. Available: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

[v] US Census, 2013. American Community Survey 5-Year Estimates, *Year Structure Built.* Data represents occupied housing units constructed prior to 1980.

[vi] SDG&E Electric Generation Fact Sheet, 2014. Available: http://www.sdge.com/newsroom/sdge-electric-generation-fact-sheet.

[vii] Office of Edmund G. Brown, Jr. Executive Order B-29-15. Available: http://gov.ca.gov/docs/4.1.15_Executive_Order.pdf. Accessed April 6, 2015.

[viii] Office of Edmund G. Brown, Jr. Governor Brown Directs First Ever Statewide Mandatory Water Reductions. Available: http://gov.ca.gov/news.php?id=18910. Accessed April 6, 2015.

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Appendix A

Emissions Inventory and Forecast Methodology

This appendix describes the emissions sectors, data sources, and methodology used to prepare the CAP's 2010 baseline emissions inventory and the 2020 emissions forecast. In the future, inventory updates should follow the methodologies presented below to provide consistency between inventory versions and allow direct comparisons from one year to another. However, it is likely that inventory methodologies will continue to evolve, and the City may find it more beneficial to follow prevailing industry standards, even if those changes make direct comparisons to prior year inventories more difficult.

It should be noted that the 2010 baseline inventory and baseline methodology appendix were prepared by the University of San Diego's Energy Policy Initiatives Center (EPIC) as part of a separate project from the remainder of the CAP (i.e., emissions forecasts, CAP document). The 2010 inventory was then used as the baseline from which AECOM prepared the 2020 emissions forecasts. Therefore, the first section of this appendix presents EPIC's baseline inventory methodology, and the second section describes AECOM's emissions forecast methodology. Although EPIC's methodology includes inventory data for three years (i.e., 2010-2012) and makes specific reference to the 2012 data, the CAP was developed with a 2010 baseline year and was based on the corresponding information.

Baseline Emissions Inventory

INTRODUCTION

This report summarizes community-scale greenhouse gas (GHG) emissions in La Mesa for 2010, 2011, and 2012.

GHGs include the sum of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) emissions and are known as CO_2 equivalents (CO_2e). Methane and nitrous oxide emissions are converted to carbon dioxide equivalents by multiplying by their Global Warming Potentials (GWP). In general, the GWPs used to estimate greenhouse gas emissions are consistent with 100-year GWPs reported by the Intergovernmental Panel on Climate Change (IPCC) in their Fourth Assessment Report (AR4) in 2007. The GWP values used are given in Table A-1.

Table A-1
Global Warming Potentials Used in La Mesa GHG Inventory

Greenhouse Gas	Global Warming Potential (GWP)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298

Community-scale emissions are calculated using standard methods as published by the ICLEI Community Protocol[1]. The ICLEI Community Protocol recommends including emissions from

[1] ICLEI U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, 2013, at http://www.icleiusa.org/tools/ghg-protocol/community-protocol

six sectors for a typical community-scale GHG inventory. These sectors are: electricity, natural gas, transportation, water, solid waste, and wastewater. For all the sectors, activity data was multiplied by a GHG emissions factor specific to each year and sector. Where region or city-specific data was available, the method deviated from the ICLEI methodology, which provides for default emissions factors by region. For example, wastewater emissions were estimated using proxy emissions factor data from the City of San Diego's Point Loma Wastewater Treatment Plant, in addition to wastewater generation estimates for La Mesa. More details on method, input data, and emissions factor information are provided in each section below.

RESULTS

Table A-2 summarizes the results of the La Mesa GHG Inventory for 2010, 2011, and 2012.

Table A-2
Summary of La Mesa GHG Inventory

Sector	2010	2011	2012
Electricity	96,604	96,003	113,711
Transportation	76,192	75,868	75,285
Natural Gas	50,705	51,745	47,997
Solid Waste	14,417	12,052	10,216
Water	7,442	7,503	7,565
Wastewater	2,441	2,519	2,249
Total (Metric Tons [MT] CO_2e[2])	**247,802**	**245,690**	**257,023**

In 2012, La Mesa emitted an estimated 257,023 metric tons (MT) CO_2e. These emissions are distributed by sector as shown in Figure A-1. Electricity demand contributes the most to overall greenhouse gas (GHG) emissions (44%), while wastewater contributes the least (1%).

[2] Carbon dioxide equivalent. This includes the greenhouse gases carbon dioxide, methane, and nitrous oxide, with carbon dioxide contributing the most to the value.

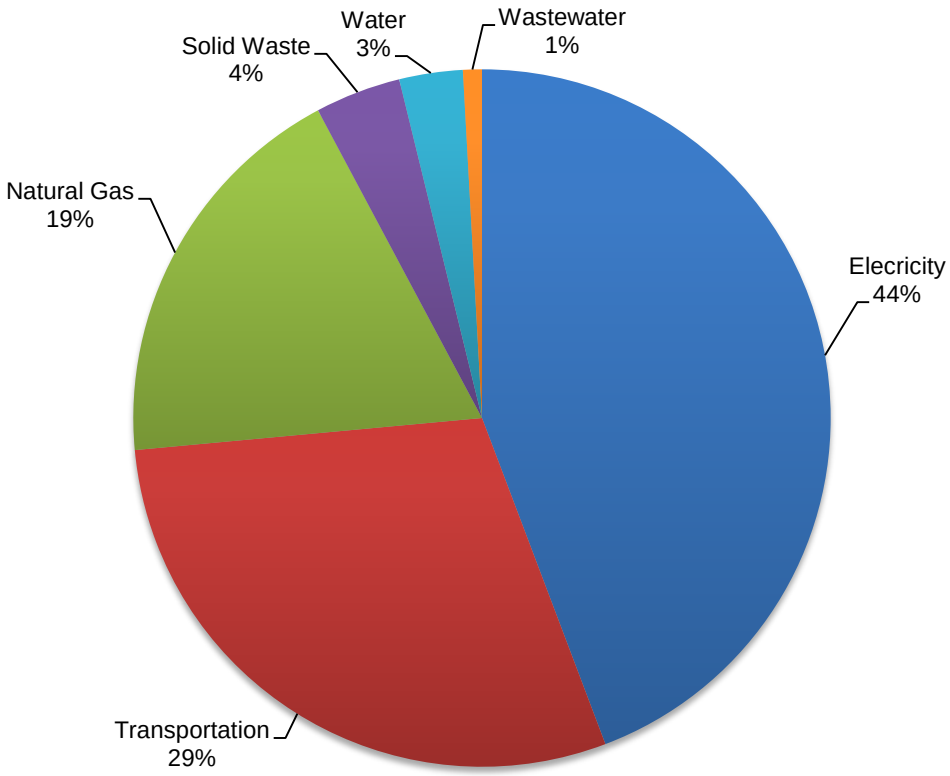

Figure A-1: Relative Breakdown of GHG Emissions in La Mesa (2012)

METHODS

Electricity

EPIC estimated emissions from electricity using the Built Environment (BE.2) method from the ICLEI Community Protocol. Annual electricity demand for La Mesa was provided by the utility and grossed up by 6.6%[3] to account for transmission and distribution losses. The resulting value was multiplied by the average annual electricity GHG emission factor for San Diego County, expressed in pounds of CO_2e per Megawatt-hour (lbs CO_2e/MWh).

EPIC developed emission factors associated with electricity consumption for 2010, 2011, and 2012 using FERC Form 1 data on purchased power and U.S. EPA Emissions and Generating Resource Integrated Database (eGRID) for electric plant emissions and allocation of cogeneration emissions between electric production and thermal energy. The emissions factors derived from these reports were validated by SDG&E personnel for accuracy. The combined (CO_2 + CH_4 + N_2O in terms of CO_2e) emissions factors for each inventory year are expressed in

[3] California Energy Demand 2015-2025 Revised Forecast, Volume 1: Statewide Electricity Demand, End-User Natural Gas Demand, and Energy Efficiency. California Energy Commission, Electricity Supply Analysis Division. Publication Number: CEC-200-2014-009-SF-REV

pounds of CO_2e per megawatt-hour (lbs CO_2e/MWh). Total electricity consumption by La Mesa, the annual GHG emissions factors, and corresponding emissions are given in Table A-3.

Table A-3
Electricity Consumption, Emissions Factors, and Corresponding GHG Emissions for La Mesa

Year	Electricity Consumption	Emissions Factor	GHG Emissions
	(kWh)	(lbs CO_2e/MWh)	(MT CO_2e)
2010	296,069,929	680	96,604
2011	296,106,280	676	96,003
2012	304,250,152	778	113,711

The emissions factor is relatively high in 2012 due to the shutdown of electricity supply from the San Onofre Nuclear Generation Station (SONGS), a GHG emissions-free supply, and its replacement by electricity produced from two other plants based on natural gas.

In 2012, emissions from the La Mesa electricity sector were 113,711 MT CO_2e. These emissions can be broken down further into residential and commercial/industrial categories, based on data provided by the utility. Figure A-2 below gives that breakdown.

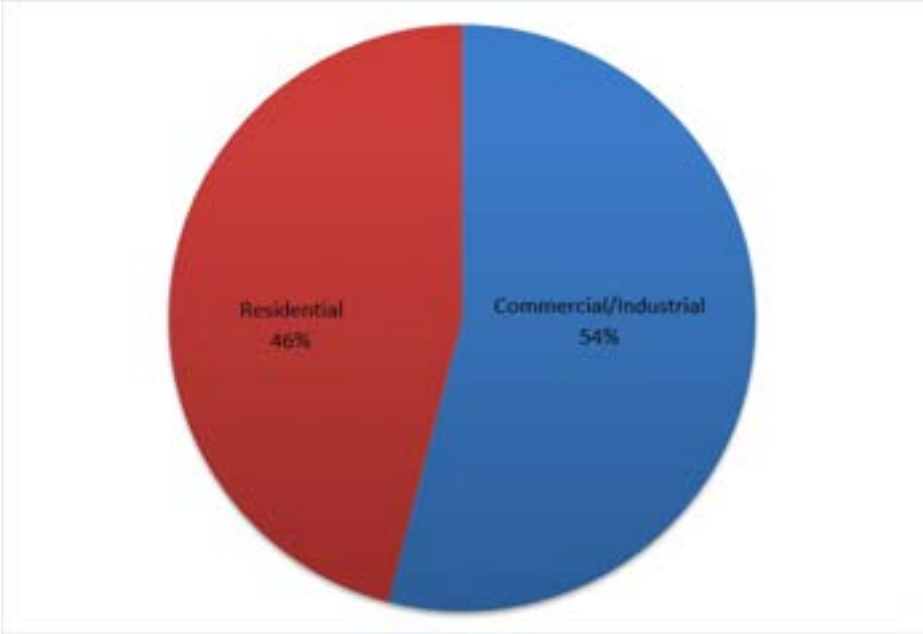

Figure A-2: GHG Breakdown of Electricity Sector (2012)

Natural Gas

Emissions from natural gas consumption by La Mesa were estimated using method Built Environment (BE.1) from the ICLEI U.S. Community Protocol. To estimate emissions from the combustion of natural gas, EPIC multiplied community fuel use by an emissions factor for

natural gas[4], based on data from the California Air Resources Board. Table A-4 summarizes emissions from natural gas with the corresponding natural gas consumption.

Table A-4
Natural Gas Consumption and Corresponding GHG Emissions

Year	Natural Gas Consumption	GHG Emissions
	(Therms)	(MT CO_2e)
2010	9,314,927	50,705
2011	9,506,014	51,745
2012	8,817,411	47,997

Emissions from the natural gas sector can be broken down further into residential and commercial/industrial categories, based on data provided by the utility. That breakdown for 2012 is given in Figure A-3.

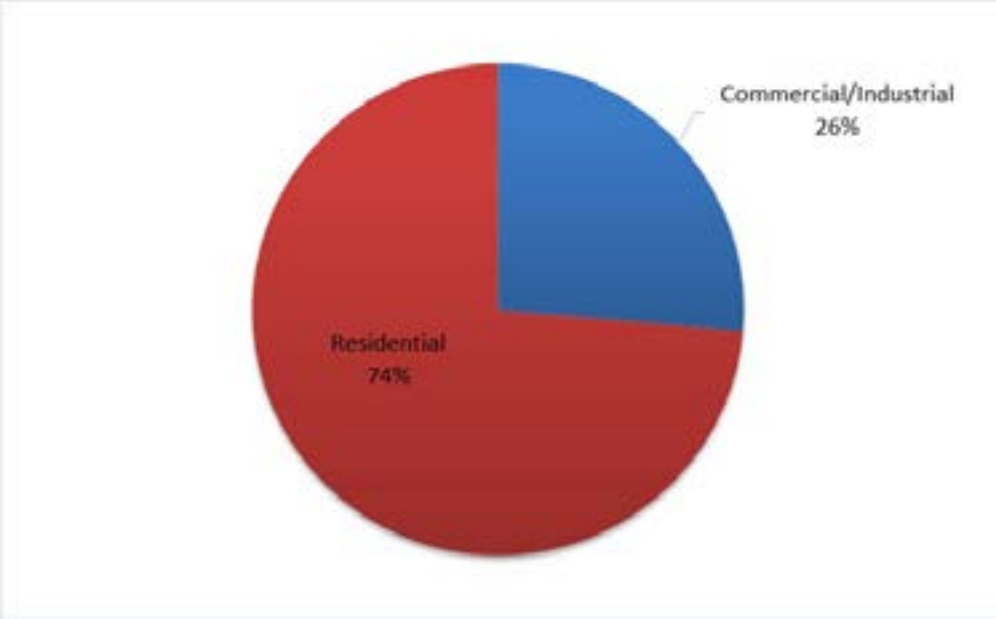

Figure A-3: GHG Breakdown of Natural Gas Sector (2012)

Transportation

To estimate GHG emissions associated with on-road transportation, EPIC uses vehicle miles traveled (VMT) and the emission rates associated with the vehicle classes. SANDAG provided regional VMT data for La Mesa for all vehicle types based on the Origin-Destination (O-D) method for 2010 and 2020. EPIC interpolated for the years not provided. The O-D VMT method as proposed by the ICLEI Community Protocol estimates miles traveled based on where a trip originates and where it ends to more accurately allocate on-road emissions to cities and regions with policy jurisdiction over miles traveled as shown in Figure A-4. O-D VMT includes trips that

[4] Natural Gas emissions factor: 0.00544342248 MMT CO_2e/Million Therms

originate and end within the designated boundary, in this case the La Mesa (Internal-Internal), and trips that either begin within the designated boundary and end outside of it (Internal-External), or vice versa (External-Internal). Internal-External and External-Internal miles are divided by 2 to evenly allocate the miles to the outside jurisdiction. Total VMT included is then multiplied by 0.96 to convert from average weekday VMT to average week VMT, including weekends. Finally, VMT from trips that begin and end outside the designated boundary (External-External) are excluded, and emissions from this category of VMT are not allocated to the jurisdiction. Table A-5 provides raw and interpolated VMT data.

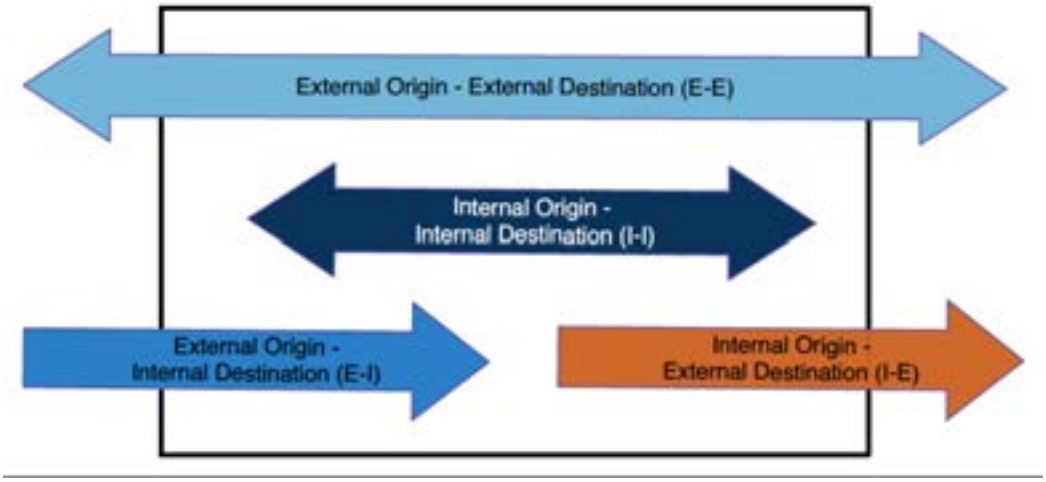

Figure A-4: Components of Origin Destination (O-D) method for calculation of Vehicle Miles Traveled (VMT) according to the ICLEI Community Protocol

Table A-5
Raw and Interpolated O-D VMT for La Mesa

Year	Internal-Internal	Internal-External and External-Internal	External-External
	(miles/day)	(miles/day)	(miles/day)
2010	162,382	541,927	1,078,439
2011	163,368	545,066	1,075,227
2012	164,355	548,205	1,072,015

Emissions rates expressed in carbon-dioxide equivalent per mile driven (CO_2e/mi) were derived from the statewide EMFAC2011 model[5], which is the California Air Resources Board's (CARB) tool used to calculate air pollution emissions, including GHGs, on a metropolitan planning organization (MPO) basis. EPIC used EMFAC2011 to generate fleet-wide CO_2e/mi values for 2010 through 2013. These emissions factors include the effects of Pavley I and the Low Carbon Fuel Standard. GHG emissions are calculated by multiplying VMT by the emissions factor.

[5] EMFAC is the Emissions Factor model developed and used by the State of California to estimate air pollutant and carbon dioxide gas emissions on a region-wide or Metropolitan Planning Organization (MPO) basis. SANDAG, the San Diego Regional Association of Governments, is the MPO for the San Diego region, which included 18 cities and 1 unincorporated county.

Table A-6 provides the GHG emissions factors and corresponding included and excluded GHG emissions.

Table A-6 Emissions Factors and Included/Excluded GHG Emissions from Transportation for La Mesa			
Year	**Emissions Factor**	**GHG Emissions Included in Inventory**	**GHG Emissions Excluded from Inventory from Vehicles Passing Through (External-External)**
	(Grams CO_2e/Mile)	(MT CO_2e)	(MT CO_2e)
2010	502	76,192	189,615
2011	497	75,868	187,141
2012	490	75,285	184,070

For 2012, emissions from the transportation contributed to 29% of total GHG emissions in La Mesa, with 75,285 MT CO_2e. Figure A-5 gives a breakdown of emissions by EMFAC vehicle class for the transportation sector for the year 2012. Light-duty trucks contribute most to emissions (38,675 MT CO_2e), while motorcycles contribute the least (160 MT CO_2e).

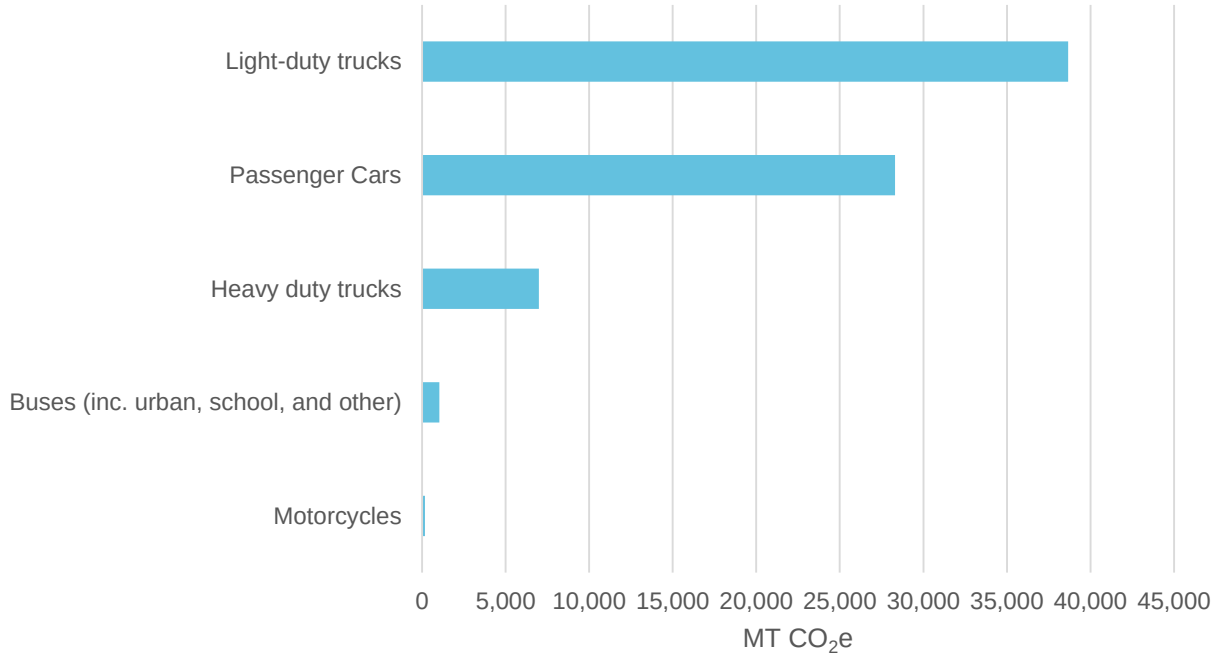

Figure A-5: GHG Emissions by Vehicle Class (2012)

Solid Waste

Solid waste emissions were estimated using method SW.4 from the ICLEI Community Protocol. This method uses disposed waste in a given year, the characterization of waste, and emissions factors from the U.S. EPA Waste Reduction Model (WARM) to estimate emissions from the disposal of solid waste. EPIC obtained data on solid waste disposal in La Mesa from the California Department of Resources Recycling and Recovery (CalRecycle) Disposal Reporting System (DRS). Alternative Daily Cover (ADC) was not included in total tonnage. The business-as-usual landfill gas (methane) capture rate used was 75%. Waste disposal data and GHG emissions from solid waste are given in Table A-7.

Table A-7
Solid Waste Disposal and Corresponding GHG Emissions for La Mesa

Year	Solid Waste Disposed	GHG Emissions
	(Wet Short Tons)	(MT CO_2e)
2010	42,718	14,417
2011	35,709	12,052
2012	30,271	10,216

Water

To the extent possible, emissions from energy use associated with the conveyance and treatment of water consumed by the La Mesa Community were estimated using the WW.14 method from the ICLEI US Community Protocol. The method considers each element of the water cycle (upstream (supply and conveyance), local conveyance/distribution, groundwater extraction, treatment, and distribution) separately, using a community-specific energy consumed per unit of water for each process of the water system given in Table A-8.

Table A-8
Commonly Used California Energy Commission (CEC) Estimates of Energy Intensity for Elements of Water Use Cycle, Southern California

Element of Water Use Cycle	Energy Intensity (kWh/Million Gallons)
Upstream[6]	9,727
Groundwater Extraction[7]	1,820
Distribution[8]	684
Local Conveyance/Distribution[9]	292
Treatment[10]	100

[6] California Energy Commission (CEC), Navigant Study, 2006

[7] Default ICLEI US Communities Protocol, assumed an extraction depth of 120 feet.

[8] California Energy Commission (CEC), 2006

[9] California Energy Commission (CEC), 2006

[10] Default estimate from ICLEI US Communities Protocol.

To estimate gallons of water consumed in La Mesa per year, an annual per capita consumption value[11] for the region for 2010 was multiplied by La Mesa's population[12]. The result was then split into groundwater and surface water using a breakdown for the Helix Water District from the 2010 San Diego County Water Authority Water Management Plan[13]. Total GHG emissions for La Mesa's water use were then estimated by taking a sum of the emissions from each process.

In 2012, emissions from the water sector were 7,565 MT CO_2e. About 90% of those emissions were a result of upstream energy use at 6,748 MT CO_2e. The relative breakdown of emissions for the water sector is given in Figure A-6.

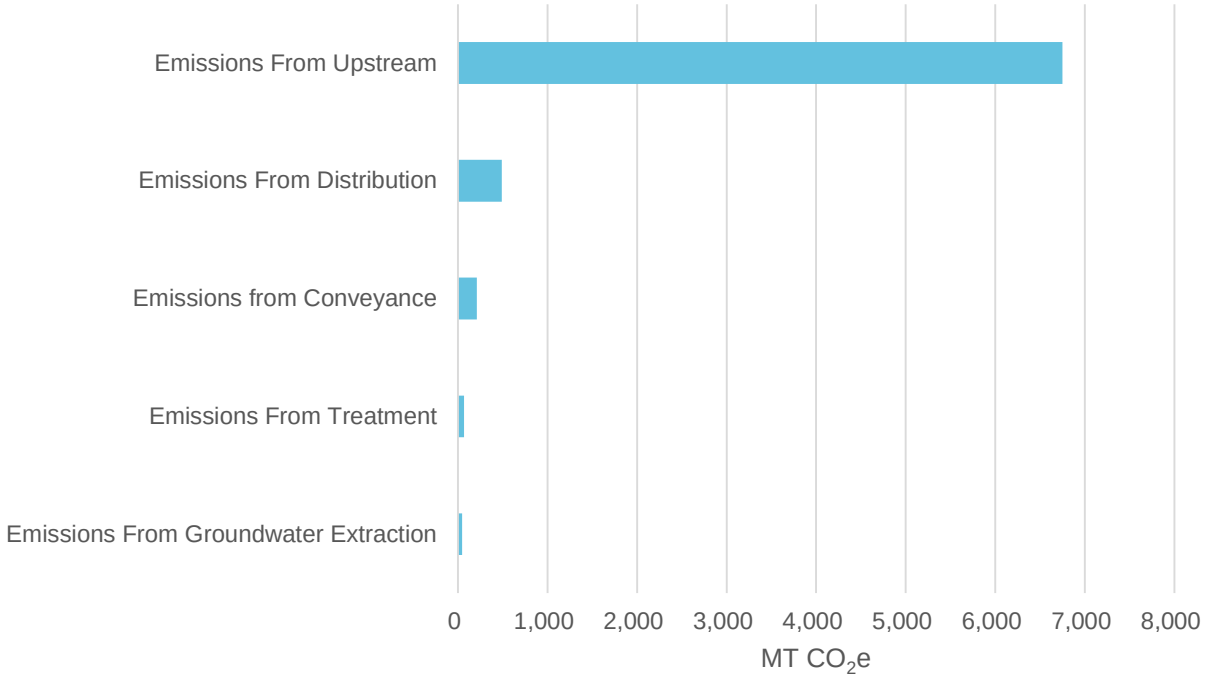

Figure A-6: Breakdown of Emissions from the Water Sector for La Mesa

Wastewater

Due to lack of data for wastewater treatment facilities used by the City of La Mesa, EPIC used energy intensity factors from the treatment of wastewater at the Point Loma Wastewater Treatment Plant in the City of San Diego as a proxy for other plants in the region. Note that if the City of La Mesa does not dispose its wastewater to the City of San Diego, these emissions estimates may underestimate La Mesa's wastewater treatment emissions. This is because the

[11] Assumed per capita consumption was 150 gallons/person/day, equivalent to 2010 regional per capita water use as reported by San Diego County Water Authority, available at http://www.sdcwa.org/2010-urban-water-management-plan.

[12] Based on SANDAG Series 12 forecast.

[13] The split is based on the groundwater to surface water ratio for Helix Water District, which supplies water to La Mesa. 2010 Urban Water Management Plan of June 2011, Appendix F, Table F-2, available at http://www.sdcwa.org/2010-urban-water-management-plan.

Point Loma facility is unique in that it is the only treatment plant in the state that has been given a waiver to treat to a lower standard than other newer treatment facilities in the state. Therefore the energy use associated with Point Loma will generally be lower than that of other treatment facilities.

The City of La Mesa provided wastewater flow data. In 2012, emissions from the treatment of wastewater for La Mesa were 2,249 MT CO_2e. Table A-9 provides annual wastewater generated by La Mesa and corresponding GHG emissions.

Table A-9
Annual Wastewater Generated by La Mesa

Year	Wastewater Generated	GHG Emissions
	(Gallons/year)[14]	(MT CO_2e/year)
2010	4,824,000	2,441
2011	4,978,000	2,519
2012	4,444,000	2,249

Community-wide Emissions Forecast Assumptions and Methodology

BUSINESS-AS-USUAL

The baseline inventory presented above was used to project the future community-wide GHG emissions under a business-as-usual (BAU) scenario. La Mesa's GHG emissions were forecast for the year 2020 assuming that historic trends describing energy and water consumption, vehicle miles traveled, and solid waste generation will remain the same in the future, on a per unit basis (i.e., per resident, per employee, per service population). Therefore, emissions forecasts demonstrate what emissions levels are likely to be under a scenario in which no additional statewide or local actions are taken to curtail emissions growth.

Table A-10 (on next page) presents the population and employment baseline and projection estimates used to develop the CAP's emissions forecasts. The 2020 population and employment values come from SANDAG's 2050 RTP. The service population line represents the sum of the community's population and employment. The compound annual growth rate was calculated for the service population from 2010-2020, and was applied to all emissions sectors (except Transportation) to estimate future emissions levels, as described in the next section. Transportation emissions were based on SANDAG's 2020 VMT estimates using the same traffic model that developed the baseline year VMT estimates.

[14] Data provided by City of La Mesa

Table A-10 Population and Employment Factors		
	2010	**2020**
Population	57,361	62,136
Employment	27,785	28,813
Service Population	85,146	90,949
Compound Annual Growth Rate (2010-2020)	-	0.66%

FORECAST METHODOLOGY

The projected population and employment growth described above was used to project all non-transportation emission sectors (i.e., electricity, natural gas, solid waste, water, wastewater). The following formula describes how GHG emissions were projected using average annual growth rates:

$$Emissions_{PHY} = Emissions_{BASE} + (Emissions_{BASE} \times AAGR \times Years)$$

Where:

$Emissions_{PHY}$ = GHG emissions during the planning horizon year

$Emissions_{BASE}$ = GHG emissions during the baseline year

AAGR = average annual growth rate (service population)

Years = years of growth between the baseline and planning horizon year

The planning horizon year 2020 emissions were projected from the baseline year 2010, which involves 10 years of growth (i.e., *Years* factor above).

Appendix B

Reduction Quantification Methodology

This appendix describes the assumptions and methodology used to estimate emissions reductions associated with implementation of the local CAP measures described in Chapter 3. Only those strategies with quantified reduction estimates provided in the CAP are presented here. Calculations and/or background information are shown for horizon year 2020 (unless otherwise stated). Supporting tables may show emissions reduction totals that vary slightly from those presented in the CAP due to rounding.

Baseline and Mitigated Scenarios

Several of the emissions reduction calculations described throughout this section are based on a baseline scenario (e.g., how much energy would be consumed if the strategy ***is not*** implemented) and a mitigated scenario (e.g., how much energy would be consumed if the strategy ***is*** implemented). The difference between the baseline and mitigated scenarios represents a strategy's reduction potential (i.e., baseline scenario - mitigated scenario = reduction potential).

Energy Strategy Inputs

Calculations for energy strategies estimate electricity or natural gas savings. These energy savings (expressed as kWh and therms) were multiplied by energy emissions factors expressed as MT CO_2e/kWh and MT CO_2e/therm. The electricity emissions factor used in these calculations assumes SDG&E's compliance with the RPS requirements for 33% of the utility's electricity to come from RPS-eligible, emissions-free sources. Using an estimated 2020 electricity emissions factor (as opposed to the 2010 baseline factor used in the emissions inventory) allows the electricity-related reduction estimates to be combined with the reductions estimated to occur as a result of implementing the RPS (presented as a statewide action within Chapter 2 of the CAP), without double-counting reduction potential. The 2020 electricity emissions factor was based on emissions inventory analysis work previously completed by EPIC within the SDG&E territory. That work estimated that SDG&E's RPS-compliant electricity portfolio would reduce its carbon-intensity from 680 lbs. CO_2e/MWh to approximately 548 lbs. CO_2e/MWh. The resulting emissions factor is shown in Table B-1 below, and referenced throughout this appendix.

The natural gas emissions factor is consistent with that used in the CAP's emissions inventory, and reflects the global warming potential provided in the United Nations' International Panel on Climate Change (IPCC) 4th Assessment Report. The natural gas emissions factor is also shown in Table B-1.

Emissions reduction estimates were calculated by multiplying a measure's total energy savings by the associated emissions factors. Electricity and natural gas emissions reductions were then combined (where applicable) to estimate total emissions reductions expressed as MT CO_2e/yr.

Table B-1 Energy Emissions Factors – 2020 Target Year		
Energy Type	**Metric Tons CO_2e/kWh**	**Metric Tons CO_2e/therm**
Electricity	0.000249	-
Natural Gas	-	0.005443

Reduction Quantification

E-1 Building Retrofit Outreach

This measure estimates the reduction in energy-related emissions (i.e., electricity and natural gas) resulting from retrofits to existing residential units and commercial properties.

SDG&E provided energy savings related to residential and commercial efficiency programs that were installed in La Mesa homes, businesses, and municipal buildings from 2010 (the CAP's baseline year) through 2014 (the most current data available at the time of plan preparation). The data identified the utility program-related energy savings within the La Mesa community shown in Table B-2. These energy savings were multiplied by the 2020 electricity emissions factors shown in Table B-1 to calculate associated emissions reductions.

Table B-2 Past Retrofit Energy Savings				
	Residential / Commercial	**Municipal**	**Total**	**Reductions (MT CO_2e/yr)**
kWh/yr	17,637,178	231,623	17,868,801	4,442
therms/yr	152,260	-	152,260	829
Total	-	-	-	**5,270**

Source: SDG&E, 2015

In addition to these past reductions that have already been realized since the CAP's 2010 baseline year, this measure estimates additional future building retrofits that could be implemented by 2020. As described in Measure E-1, there are several retrofit-oriented programs available to La Mesa residents, including two PACE financing programs that could drive additional program participation. It is also likely that utility-sponsored programs will continue into the near future, through SDG&E, Energy Upgrade California, or similar programs. This measure assumed that similar levels of program participation would occur through the 2020 horizon year for residential and commercial customers, as was seen from 2010-2014. This additional level of participation in retrofit programs would provide additional reductions of 5,213 MT CO_2e/yr, as shown in the table below.

Table B-3 Estimated Future Retrofit Energy Savings				
	Residential / Commercial	**Municipal**	**Total**	**Reductions (MT CO_2e/yr)**
kWh/yr	17,637,178	-	17,637,178	4,384
therms/yr	152,260	-	152,260	829
Total	-	-	-	**5,213**

Total reductions from implementation of this measure are estimated at approximately 10,484 MT CO_2e/yr, as shown in Table B-4.

Table B-4 Total Measure E-1 Retrofit Energy Savings		
	Total	**Reductions (MT CO_2e/yr)**
kWh/yr	35,505,979	8,826
therms/yr	304,519	1,658
Total	**-**	**10,484**

E-2 Shade Tree Outreach

This measure is based on estimates of the energy savings associated with building shade trees planted next to single-family residential units. The measures assumes that an equal number of shade trees would be planted from 2010 through 2020 until the total number of trees shown in the progress indicator table in Chapter 3 is achieved. The measure also assumes that the trees are 10-years old at planting, and that each year their ability to offset electricity use (through increased shade generation) also increases.

The measure calculated the total annual electricity savings in 2020 associated with building shade trees based on their relative age from the planting year (i.e., all trees are 10-years old at planting; trees planted in 2010 offset more electricity by 2020 than those planted in 2019). Total electricity savings of approximately 11,000 kWh/yr by 2020 were estimated. Those savings were multiplied by the 2020 electricity emissions factor from Table B-1 to calculate reductions of nearly 3 MT CO_2e/yr, which was rounded up to 5 MT CO_2e/yr in the CAP.

E-3 Municipal Energy Efficiency Goal

As described in the CAP, the City participated in SANDAG's Energy Roadmap program to identify municipal energy efficiency opportunities based on building energy audits. The Roadmap identified near-term retrofit projects that, if implemented, could result in municipal energy and utility cost savings. Table B-5 presents the municipal energy savings estimated as part of the Roadmap program and their corresponding emissions reductions based on the energy emissions factors presented in Table B-1.

Table B-5 Measure E-3 Inputs		
	Energy Savings	**Reductions (MT CO_2e/yr)**
kWh/yr	123,584	31
therms/yr	1,267	7
Total		**38**

E-4 Public Lighting

This measure estimates the reduction in electricity-related emissions resulting from the City's past installation of high-efficiency traffic signal bulbs (i.e., LED red and green bulbs) and on-going street light retrofits (i.e., high-efficiency induction lights). The City's 2005 municipal inventory identified electricity consumption from traffic signals/controllers and streetlights, which were used as a proxy to estimate current consumption levels conservatively. It is possible that the City has increased its traffic signal and/or street light system since 2005, which would increase the total electricity consumption that could be affected by this measure (and result in a higher reduction potential). However, at the time of CAP preparation, the 2005 municipal inventory provided the best available data related to this measure.

Table B-6 shows the total electricity consumed by these two lighting sources, and the underlying assumptions that 100% of associated lighting would be retrofitted to provide 50% electricity savings by the 2020 target year. The 2020 electricity emissions factor from Table B-1 was used to calculate total emissions reductions related to the lighting retrofits.

Table B-6 Measure E-4 Inputs	
2005 Municipal Inventory Sectors	**kWh/yr**
Traffic Signals/Controllers	581,090
Streetlights	1,069,794
Total	1,650,884
Measure Assumptions	**%**
Lights Retrofitted	100%
Electricity Savings	50%
Measure Results	**Values**
Mitigated Energy Use (kWh/yr)	825,442
Reductions (MT CO2e/yr)	**205**

E-6 Solar Photovoltaic Outreach

This measure estimates the reduction in electricity-related emissions resulting from installation of grid connected photovoltaic (PV) systems in residential and commercial uses. The measure

uses National Renewable Energy Laboratory (NREL) solar insolation data specific to the City's geographic location and climate to estimate future PV-related reductions.

This measure considers reductions resulting from solar PV systems already installed community-wide from 2010-2014, and potential additional community-wide installations to occur by 2020.

Similar to the retrofit-related energy savings described in Measure E-1 above, SDG&E also provided data on the amount of solar PV generation capacity installed community-wide from 2010-2014. Based on this data, approximately 3.9 MW of solar capacity were installed during that timeframe. In addition, currently available tax credits, utility rebates, and financing programs make solar PV installations increasingly economically viable, which will likely lead to additional residential and non-residential installations in the future. Therefore, the CAP conservatively assumed installation of another 2.3 MW of solar PV capacity by 2020 (i.e., in addition to the capacity installed since 2010). This conservative estimate takes into account the gradual phase-out of California utility-funded solar incentive programs.

Table B-7 shows the inputs and calculations used to convert estimated installed solar PV capacity to electricity generation potential and emissions reductions.

Table B-7
Solar PV Generation Capacity

MW Installed Capacity	6.13
kW per MW	1,000
Solar Hours per Day [1]	4.9
Days per Year	365
Electricity Generation Capacity (kWh/yr)	10,963,505
Electricity Emissions Factor [2]	0.000249
Reductions (MT CO_2e/yr)	**2,730**

[1] Solar Insolation data: National Renewable Energy Laboratory Renewable Resource Data Center, 2011
[2] From Table B-1

T-1 Bicycle and Pedestrian Infrastructure Development

This measure quantifies reductions resulting from increasing La Mesa's bicycle mode share through expansion of its bicycle infrastructure, primarily Class I and II bicycle facilities. Based on the City's Bicycle Facilities and Alternative Transportation Plan (Bicycle Plan), it was assumed that there were 12.8 miles of existing bike lanes within the community, and an additional 12.8 miles planned for future installation. The Bicycle Plan does not include an implementation timeframe, so it was assumed that the additional bike lanes would be completed by 2035. This would require 0.64 miles of new bike lanes to be completed each year (i.e., 2015-2035), and would result in 3.2 new miles by the CAP's 2020 target year.

Emissions reductions were calculated based on VMT differences between a BAU scenario and a mitigated scenario (see Table B-8). The CAPCOA methodology was used to help quantify VMT reductions based on the proposed bicycle infrastructure improvements. A mode share study conducted by Dill and Carr was also used to help define assumptions regarding how additional bicycle lane installations translate into increased bicycle mode share. The methodology assumes that the ratio of additional bicycle lane mileage per community area correlates to increased bicycle mode share, above levels reported in the 2010 US Census.

Table B-8
Community-wide VMT Reductions – Bicycle Infrastructure Improvements

BAU Scenario – Vehicles Miles Traveled		
	Community Travel (miles)	Fuel Consumption (gallons)
Gasoline	158,288,534	8,500,995
Diesel	9,212,560	1,164,673
Total	167,501,094	9,665,668
Mitigated Scenario – Vehicles Miles Traveled		
	Community Travel (miles)	Fuel Consumption (gallons)
Gasoline	158,196,975	8,496,078
Diesel	9,207,231	1,163,999
Total	167,404,206	9,660,077
BAU minus Mitigated Scenario		
	Community Travel (miles)	Fuel Consumption (gallons)
Gasoline	91,558.8	4,917
Diesel	5,328.8	674
Total	96,888	5,591

Sources:
CAPCOA. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reductions from Greenhouse Gas Mitigation Measures.* August, 2010.
Dill, J and Carr, T. *Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them*. 2003.

T-6 Municipal Fleet Transition

This measure estimates reductions associated with transitioning the municipal fleet towards alternative fuel vehicles. As described in the CAP, the City analyzed alternative fuel vehicle opportunities within its municipal fleet through the Energy Roadmap Program. This analysis identified five potential opportunities for vehicle fleet transitions toward alternative fuel options. Of those five opportunities, it was assumed that two could be pursued prior to the CAP's 2020 target year, while the other three would require additional refueling infrastructure development before CNG or propane vehicles could be pursued.

Table B-9 shows the inputs used to estimate emissions reductions from pursuing the two identified vehicle replacement options. The measure assumes that a 1998 Ford Taurus and a 1996 Ford Explorer are replaced with hybrid electric vehicle options.

Table B-9
Measure T-6 Inputs

Replacement Vehicle Inputs [1]					
Alt Fuel Vehicle	**Mileage**	**MPG (Old)**	**MPG (New)**	**Gallons Displaced (Gasoline)**	**Emissions Reduced (MT CO_2e/yr)**
Hybrid Electric	10,000	22	42	216.5	2.0
Hybrid Electric	6,000	10.3	25	342.5	3.2
				Total	**5.2**

Global Warming Potentials [2]	
CO_2	1
CH_4	25
N_2O	298

Emissions Factors [3]		
Motor Gasoline	8.81	kg CO_2/gallon
1998 Passenger Vehicle		
N_2O	0.0393	g/mile
CH_4	0.0249	g/mile
1996 Light-Duty Truck		
N_2O	0.0871	g/mile
CH_4	0.0452	g/mile

[1] City of La Mesa Energy Roadmap, Appendix D, pg. D-8.

[2] IPCC (https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html)

[3] California Climate Action Registry. 2009. General Reporting Protocol Version 3.1.

W-1 Urban Water Management Plan Programs

Senate Bill X7-7 established a goal to reduce per capita water consumption by 20% by December 31, 2020. In order to calculate the water savings and emission reductions associated with implementation of SB X7-7, the baseline year's total water consumption was divided by the City's baseline population to determine the baseline per capita water consumption rate in units of million gallons per capita per year (MG/capita/yr).

Assuming business-as-usual (BAU) growth, the projected 2020 population was multiplied by the baseline per capita water consumption rate (MG/capita/yr) to estimate the total BAU water consumption in year 2020. Then, assuming implementation of SB X7-7, the baseline per capita water consumption rate was multiplied by (1 – 0.2) to calculate the SB X7-7 target per capita water consumption rate in year 2020. The target per capita water consumption rate was then

multiplied by the projected 2020 population to estimate the total water consumption for the City assuming implementation of SB X7-7. Total water savings were calculated by subtracting the SB X7-7 total water consumption from the BAU total water consumption.

The total water savings associated with SB X7-7 were then multiplied by a water intensity factor in units of megawatt-hours per million gallons to estimate the associated electricity saved from the water savings. Finally, the electricity saved was multiplied by the estimated 2020 electricity emissions factor shown in Table B-1 to estimate the GHG savings associated with implementation of SB X7-7 in the community. The table below identifies the inputs used to calculate emissions reductions associated with this measure.

Table B-10
Measure W-1 Inputs

Baseline Year – 2010		
Operational Year	2010	year
Total Water Consumption	2,318	million gallons (MG)
Population (residents)	57,361	capita
Baseline Water Efficiency	0.04	MG/capita/yr
Planning Horizon Year – 2020		
Operational Year	2020	year
Planning Horizon Population (residents)	62,136	capita
Total BAU Water Consumption	2,511	million gallons (MG)
SB X7-7 Water Efficiency Level	0.032	MG/capita/yr
Total Water Consumption (under SB X7-7)	2,009	million gallons (MG)
Water Savings	502	MG/yr
Water Use Energy Intensity Factors [1]		
Water Process	**La Mesa Water Intensity**	**Units**
Total Water Consumption	10.41	MWh/MG

Energy Savings and Reductions			
Water Savings (MG/yr)	Water Intensity (MWh/MG)	Energy Savings (MWh/yr)	Reductions (MT CO_2e/yr)
502	10.41	5,226	**1,301**

[1] Water intensity value was not provided in baseline emissions inventory. Therefore, the total emissions allocated to water consumption in the baseline inventory were used to develop an emissions-per-gallons consumed factor by dividing total emissions by baseline 2010 water consumption. Water intensity (emissions per MG) was then converted to MWh/MG using the baseline electricity emissions factor. Baseline 2010 water consumption was calculated using a per capita water consumption factor provided in the EPIC GHG inventory report, and year 2010 population obtained from SANDAG 2050 RTP.

SW-1 Food Scrap and Yard Waste

An inventory of the community's organic waste was created using Cal Recycle waste volume and characterization data. Using the first-order decay methodology from the 2006 IPCC

guidelines, fugitive methane emissions from the organic landfill waste were calculated for base-case and mitigated scenarios. This measure assumes that residential households will divert 5% of food scrap and compostable paper waste from landfills by 2020. The measure further assumes that 90% of residential and commercial landscape waste is diverted from the solid waste stream, either through on-site composting/mulching or disposal in green waste bins. This measure would apply to GHG emissions associated with new waste generated and would not apply to waste in place disposed prior to CAP implementation. Further, these calculations are based on the assumption that the landfill(s) accepting the City's waste have a methane capture system in place with a 75% efficiency rate.

The City's waste inventory was modeled using community-wide waste disposal data collected from CalRecycle for the years 1995-2013. These historical disposal rates (i.e., waste tons disposed per population) were projected to 2020 using estimated population growth rates, and backcast to 1950 using historic census data. The 2008 State Waste Characterization Study was used to estimate the volume of community-wide waste by various waste categories (e.g., lumber, food scraps, grass). It was assumed that the City's waste composition is comparable to that of the statewide average (as represented in the State Waste Characterization Study). This created the community-wide baseline solid waste emissions profile, against which solid waste diversion measures were calculated.

The community-wide total 2020 estimated tonnage was then multiplied by the proportional share of each appropriate waste category in the State's waste characterization study, and multiplied by the measure's participation rates to determine the total solid waste to be diverted from implementation of this measure. The IPCC's first-order decay methodology was then applied to calculate the total GHG emissions associated with that volume of waste to determine the measure's GHG reduction levels.

The baseline emissions inventory solid waste sector was calculated using a methodology different than the first-order-decay used to estimate the solid waste measures' emissions reductions. In order to correct for the varying methodologies, the CAP's 2020 solid waste sector inventory estimates were divided by the 2020 emissions modeled from the solid waste data described above. This ratio was then applied to each solid waste reduction measure to prepare reduction estimates that were scaled to correct the variation in the two solid waste emissions methodologies.

SW-2 Construction and Demolition Waste Diversion

This measure assumes community-wide compliance with the City's requirement for 75% of construction and demolition (C&D) waste to be diverted from landfills. The same methodology as described in Measure SW-1 above was applied to calculate reductions from implementation of this measure.

G-I URBAN FOREST MANAGEMENT

This measure estimates reductions associated with the carbon sequestration potential of new trees planted as part of City landscaping requirements and development agreements. The calculations are based on extrapolating the carbon potential of a typical tree planting palette. The measure assumes that nearly 500 net new trees will be planted community-wide from 2010-2020. Trees planted to achieve implementation of this Urban Forest Program measure might be found in decorative landscaping, new City street planting strips, or parks and recreation areas.

A sample plant palette was created, including Lemon Bottlebrush, Brazilian Pepper, Victorian Box, Sweetgum, and Carob. There are myriad tree palette options, and the tree types included in this measure's calculations may not correlate exactly with those selected for planting in the community. Carbon sequestration rates specific to the species and age of the sample plant palette were collected from the Center for Urban Forest Research (CUFR) Tree Carbon Calculator and used to calculate the annual sequestration potential of the trees from 2010 – 2020. For purposes of the calculation it was assumed that an equal number of trees will be planted each year, though the exact number of trees planted per year may vary.