

CITY OF GROVER BEACH FINAL CLIMATE ACTION PLAN

*Adopted by City Council
September 15, 2014*



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September 15, 2014*

Prepared for:



City of Grover Beach

Prepared by:



Rincon Consultants, Inc.

Environmental Scientists Planners Engineers

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Table of Contents

Executive Summary	ES-1
Chapter 1: Introduction	
1.1 Purpose and Scope	1-1
1.2 Content.....	1-2
1.3 Background and Planning Process.....	1-2
1.4 Relationship to General Plan	1-3
1.5 Relationship to CEQA	1-4
1.6 Scientific Background	1-5
1.7 Climate Change Impacts.....	1-7
1.8 Implications for Grover Beach	1-8
1.9 Regulatory Background	1-8
Chapter 2: GHG Emissions and Reduction Target	
2.1 2005 Baseline GHG Emissions	2-1
2.2 2020 GHG Emissions Forecast	2-5
2.3 GHG Emissions Reduction Target.....	2-10
Chapter 3: Climate Action Measures	
3.1 Chapter Organization.....	3-1
3.2 City Government Operations Measures	3-2
3.3 Community-wide Measures	3-4
3.4 GHG Reduction Summary	3-18
Chapter 4: Adaptation	
4.1 Climate Change Predictions and Vulnerability	4-1
4.2 Adaptation Measures	4-4
Chapter 5: Implementation and Monitoring	
5.1 Implementation Matrix.....	5-1
5.2 Implementation and Monitoring Policies.....	5-15
5.3 Funding Sources	5-16
Chapter 6: References and Preparers	
6.1 References.....	6-1
6.2 List of Preparers.....	6-3

TABLE OF CONTENTS

LIST OF TABLES

Table ES-1: 2020 Business-as-Usual GHG Emissions Forecast	ES-3
Table ES-2: Summary of Reductions from State and Local Measures and 2020 GHG Emissions	ES-4
Table ES-3: Grover Beach's GHG Emissions, Target, and Reduction Necessary to Meet Target	ES-4
Table 1-1: Global Warming Potential of GHGs	1-7
Table 1-2: APCD GHG Significance Thresholds	1-13
Table 2-1: Community-wide GHG Emissions by Sector (2005).....	2-3
Table 2-2: City Government GHG Emissions by Sector (2005)	2-4
Table 2-3: 2020 Business-As-Usual GHG Emissions Forecast.....	2-5
Table 2-4: Summary of State Reductions	2-6
Table 2-5: Summary of Local Reductions	2-8
Table 2-6: Summary of Reductions from State and Local Measures and 2020 GHG Emissions	2-10
Table 2-7: Grover Beach's GHG Emissions, Target, and Reduction Necessary to Meet Target	2-10
Table 3-1: Measure Cost and Savings.....	3-1
Table 3-2: City Government Operations GHG Reductions by Measure.....	3-2
Table 3-3: Energy GHG Reductions by Measure	3-4
Table 3-4: Transportation and Land Use GHG Reductions by Measure.....	3-8
Table 3-5: Off-Road GHG Reductions by Measure	3-14
Table 3-6: Solid Waste GHG Reductions by Measure	3-16
Table 3-7: Summary of GHG Reductions by Measure	3-18
Table 4-1: Climate Change Vulnerability.....	4-2
Table 5-1: Implementation Matrix.....	5-2

LIST OF FIGURES

Figure ES-1: Community-wide GHG Emissions by Sector (2005)	ES-2
Figure ES-2: City Government Operations GHG Emissions by Sector (2005)	ES-2
Figure 1-1: The Greenhouse Effect.....	1-5
Figure 1-2: Historic Fluctuations and Recent Increases in Atmospheric Carbon Dioxide.....	1-6
Figure 2-1: Community-wide GHG Emissions by Sector (2005)	2-3
Figure 2-2: City Government GHG Emissions by Sector (2005)	2-4
Figure 2-3: 2020 Business-as-Usual GHG Emissions Forecast.....	2-6
Figure 2-4: GHG Emissions in Relation to Target.....	2-11

APPENDICES

- Appendix A: GHG Emissions Inventory
- Appendix B: Technical Appendix
- Appendix C: CAP Consistency Worksheet

Acronyms

AB	Assembly Bill
APCD	San Luis Obispo County Air Pollution Control District
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAFE	Corporate Average Fuel Economy
CAP	Climate Action Plan
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CH ₄	Methane
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GHG	Greenhouse gas
HFC	Hydrofluorocarbons
HVAC	Heating, ventilating, and air conditioning
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt hours
LCFS	Low Carbon Fuel Standard
LED	Light-Emitting Diode
MHCP	Multiple Habitat Conservation Program
MPO	Metropolitan Planning Organization
MT	Metric tons
N ₂ O	Nitrous oxide
O ₃	Ozone
PFCs	Perfluorocarbons
PG&E	Pacific Gas and Electric
PV	Photovoltaic
RTA	Regional Transit Authority
SB	Senate Bill
SLOCOG	San Luis Obispo Council of Governments
TDM	Transportation demand management
VMT	Vehicle miles traveled

The City Council adopted this Climate Action Plan (CAP) on September 15, 2014 but acknowledged that the 2020 business-as-usual greenhouse gas (GHG) forecast for transportation emission of 25,481 MT CO₂e is overestimated as shown in Table ES-1. The source of GHG emissions from transportation sources is based entirely on the number of vehicle miles traveled (VMT). At the time the initial process began to prepare the CAP in April 2012, the best available data was used to calculate the VMT baseline year of 2005 and VMT forecast for 2020. However, the data used is already outdated because assumptions for population growth have decreased and revised VMT data indicates a reduction in VMT per capita. This will likely result in a lowered target GHG reduction of 5,715 MT CO₂e by 2020.

However, it is recognized that the initial adoption of the CAP is a first step towards monitoring and evaluating the effectiveness of GHG reduction measures, which will not be known until an updated GHG emission inventory for the City is completed. Therefore, in the interim, the City Council has decided to adopt the CAP "as-is" which will allow the City to move forward with implementing GHG reduction measures knowing that the next update to the CAP will include updated data and revised VMT projections.

EXECUTIVE

SUMMARY

Executive Summary

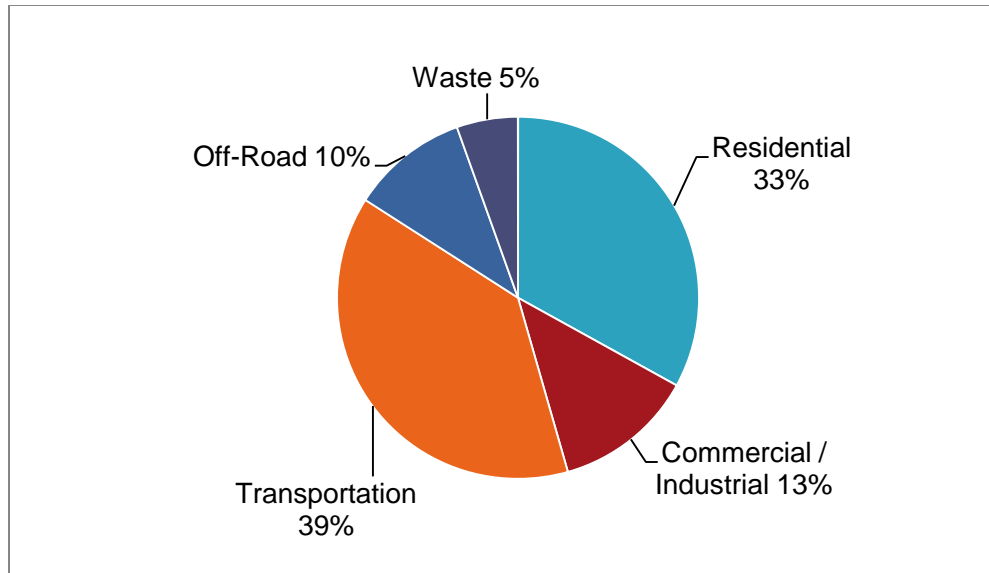
The City of Grover Beach Climate Action Plan (CAP) is a long-range plan to reduce greenhouse gas (GHG) emissions from City government operations and community activities within Grover Beach and prepare for the anticipated effects of climate change. The CAP will also help achieve multiple community goals such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life. Specifically this CAP is designed to:

- Benchmark Grover Beach's 2005 baseline GHG emissions and 2020 projected emissions relative to the statewide emissions target established under California Assembly Bill (AB) 32 of 1990 levels by 2020 (approximately 15 percent below 2005 levels by the year 2020).
- Provide a roadmap for achieving the City's GHG emissions reduction target of 15 percent below 2005 levels by the year 2020 and help Grover Beach prepare for anticipated climate change impacts.
- Implements Grover Beach's General Plan Land Use policies 27.1 and 27.2, which direct the City to prepare this CAP.
- Serve as a qualified and comprehensive plan for addressing the cumulative impacts of GHG emissions within Grover Beach (see California Environmental Quality Act [CEQA] Guidelines, Sections 15183.5, and the San Luis Obispo County Air Pollution Control District [APCD] CEQA Air Quality Handbook, Sections 3.3 and 4.6).
- Support tiering and streamlining of the analysis of GHG emissions for future projects within Grover Beach pursuant to State CEQA Guidelines Sections 15152 and 15183.5.

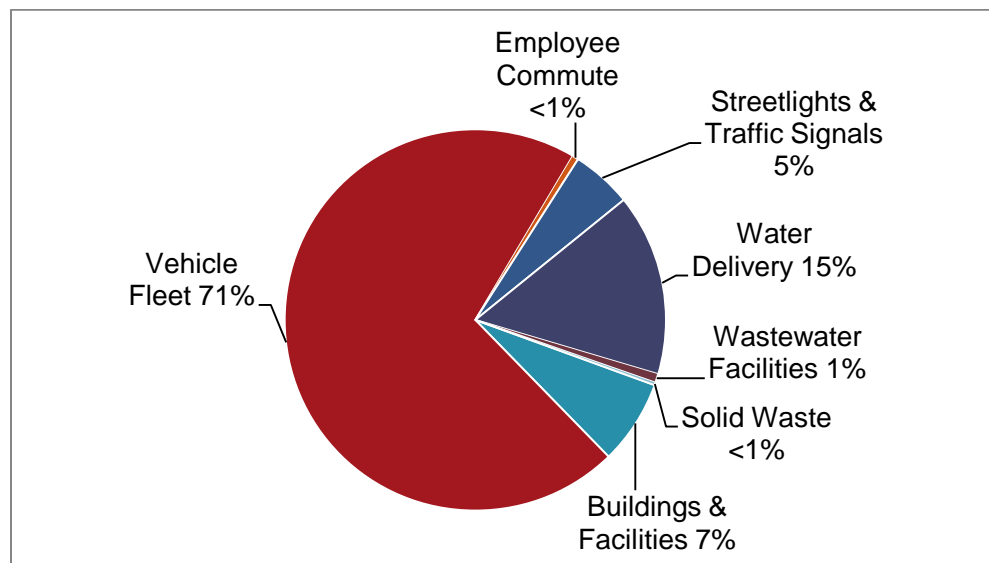
Grover Beach's GHG Emissions

The *City of Grover Beach 2005 Greenhouse Gas Emissions Inventory Update* (2013) (GHG Emissions Inventory) was prepared to identify the major sources and quantities of GHG emissions produced in Grover Beach in 2005 and forecast how these emissions may change over time. The GHG Emissions Inventory provides information on the scale of emissions from various sources and where the opportunities to reduce emissions lie. It also provides a baseline against which the City can measure its progress in reducing GHG emissions.

According to the GHG Emissions Inventory, in 2005, the Grover Beach community emitted approximately 48,169 metric tons of carbon dioxide equivalent GHG emissions (MT CO₂e), as a result of activities that took place within the transportation, residential energy use, commercial and industrial energy use, off-road vehicles and equipment, and solid waste sectors. As shown in **Figure ES-1**, the largest contributors of GHG emissions were the transportation (39 percent), residential energy use (33 percent) and commercial/industrial energy use (13 percent) sectors. The remainder of emissions resulted from the off-road (10 percent) and solid waste (five percent) sectors.

Figure ES-1: Community-wide GHG Emissions by Sector (2005)

The GHG Emissions Inventory also analyzed emissions from City government operations and facilities. The City government operations inventory is a subset of the community-wide inventory, and is included within the community-wide inventory. In 2005, City government operations generated approximately 1,344 MT CO₂e. This quantity represents approximately three percent of Grover Beach's total community-wide GHG emissions. As shown in **Figure ES-2**, the majority of these GHG emissions resulted from the City's vehicle fleet (71 percent), water delivery (15 percent), and building and facility energy use (seven percent).

Figure ES-2: City Government Operations GHG Emissions by Sector (2005)

The GHG emissions forecast is a projection of how GHG emissions will change in the future with projected changes in population and jobs.¹ The “business-as-usual scenario” provides a forecast of how GHG emissions will change in the year 2020 if consumption trends and behavior continue as they did in 2005, absent any new federal, state, regional, or local policies or actions that would reduce emissions. The year 2020 was selected for the forecast in order to maintain consistency with AB 32.

Under the business-as-usual scenario, Grover Beach’s GHG emissions are projected to grow approximately 20 percent above 2005 GHG emissions levels by the year 2020, from 48,169 MT CO₂e to 57,794 MT CO₂e. Emissions associated with the transportation sector will experience the highest level of growth (37 percent). Emission increases for the other sectors will range from three to 21 percent. **Table ES-1** shows the forecast results of the business-as-usual scenario.

Table ES-1: 2020 Business-As-Usual GHG Emissions Forecast

Sector	2005 (MT CO ₂ e)	2020 (MT CO ₂ e)	Percent Change from 2005 to 2020
Residential	15,915	16,318	3%
Commercial / Industrial	6,033	7,206	19%
Transportation	18,549	25,481	37%
Off-Road	5,034	6,084	21%
Solid Waste	2,638	2,705	3%
TOTAL	48,169	57,794	20%

The *AB 32 Climate Change Scoping Plan* (2008) (AB 32 Scoping Plan), prepared by the California Air Resources Board (CARB) pursuant to AB 32, identifies several State measures that are approved, programmed, and/or adopted and would reduce GHG emissions within Grover Beach. These State measures require no additional local action. In addition to the State measures, the City of Grover Beach has implemented, adopted, and/or programmed a number of local measures since the 2005 baseline inventory year that will reduce the community’s GHG emissions. Therefore, these measures were incorporated into the forecast and reduction assessment to create an “adjusted forecast scenario,” which provides a more accurate picture of future emissions growth and the responsibility of the City once State and local measures to reduce GHG emissions have been implemented.

As shown in **Table ES-2**, state and local measures will reduce GHG emissions in Grover Beach by an estimated 11,135 MT CO₂e by 2020. Under the adjusted forecast scenario GHG emissions are projected to decrease to 46,659 MT CO₂e (approximately 19 percent below the business-as-usual scenario of 57,794 MT CO₂e).

¹ Population and job projections for the year 2020 were obtained from the San Luis Obispo Council of Governments (SLOCOG) 2040 Population, Housing & Employment Forecast (August 2011) and revised job data was obtained from the San Luis Obispo Council of Governments’ March 6, 2013 staff report titled “Correction to the 2040 Regional Growth Forecast (RGF) Employment Estimates and Potential Changes to Regional Housing Needs Allocation” (see Chapter 2).

Table ES-2: Summary of Reductions from State and Local Measures and 2020 GHG Emissions

State Measure	2020 Reduction (MT CO ₂ e)
2020 Business-as-Usual Forecast	57,794
2020 Reduction from State Measures	-10,641
2020 Reduction from Local Measures	-494
Total Reduction from State and Local Measures	-11,135
2020 Adjusted Forecast	46,659

GHG Emissions Reduction Target

The City is committed to reducing its GHG emissions by 15 percent below 2005 levels by 2020, consistent with AB 32. As shown in **Table ES-3**, based on the 15 percent reduction target Grover Beach would need to reduce its community-wide GHG emissions to 40,944 MT CO₂e by 2020. To meet this target, Grover Beach will need to reduce its GHG emissions 12 percent below the adjusted forecast level (equivalent to 5,715 MT CO₂e) by 2020 through implementation of local measures and actions.

Table ES-3: Grover Beach's GHG Emissions, Target, and Reduction Necessary to Meet Target

	GHG Emissions (MT CO ₂ e)
2005 Baseline Emissions	48,169
2020 Adjusted Forecast	46,659
Target (15% below 2005 levels by 2020)	40,944
Remaining Gap Necessary to Meet Target	5,715

Climate Action Measures

To achieve the City's target of 15 percent below 2005 levels (40,944 MT CO₂e) by 2020 and prepare for the anticipated effects of climate change, the CAP identifies climate action measures. These measures are organized into the following focus areas: City government operations, energy, transportation and land use, off-road, and solid waste. The measures were selected based on careful consideration of the emission reductions needed to achieve the target, the distribution of emissions in the GHG Emissions Inventory, goals and policies identified in the City's General Plan, existing priorities and resources, and the potential costs and benefits of each measure. Collectively, the measures identified in the CAP have the potential to reduce GHG emissions within Grover Beach by 5,715 MT CO₂e (15 percent below the 2005 baseline) by 2020 and meet the reduction target.

Implementation and Monitoring

Implementation and monitoring are essential processes to ensure that Grover Beach reduces its GHG emissions and meets its target. To facilitate this, each climate action measure identifies implementation actions, departments responsible for implementation and monitoring, cost and savings estimates, the GHG reduction potential, a performance indicator to monitor progress, and an implementation time frame. Measure implementation is separated into three phases: near-term (by 2015), mid-term (2016-2017), and long-term (2018-2020).

In order to ensure that measures are implemented and their progress is monitored, upon adoption of the CAP, the City will establish a CAP Coordinator who will provide essential CAP oversight and coordination of a multi-departmental CAP Implementation Team comprised of key staff in each selected department. The CAP Implementation Team will meet at least one time per year to assess the status of CAP efforts. The City's CAP Coordinator will be responsible for developing an annual progress report to the City Council that identifies the implementation status of each measure, evaluates achievement of or progress toward performance indicators (where applicable), assesses the effectiveness of various measures and actions included in the CAP, and recommends adjustments to measures or actions, as needed. To evaluate the performance of the CAP as a whole, the City will update the community and City government GHG emissions inventories every five years, using the most up-to-date calculation methods, data, and tools.

CHAPTER 1

INTRODUCTION

1.0 Introduction

Although climate change is a global issue, the State of California recognizes that it poses risks to the public health, environment, economic well-being, and natural resources of California, and has taken an active approach to address climate change through the adoption of legislation and policies. In 2005, the governor issued Executive Order S-3-05 to reduce statewide GHG emissions to 1990 levels by 2020 (approximately 15 percent below 2005 levels) and to 80 percent below 1990 levels by 2050. Enactment of several related pieces of climate action legislation followed, including AB 32 (the Global Warming Solutions Act of 2006), which codified the 2020 target, and SB 97 (the CEQA and GHG Emissions Bill of 2007), which requires lead agencies to analyze GHG emissions and mitigate climate change impacts under CEQA. These laws together create a framework for GHG emissions reductions and identify local governments as having a vital role to play in assisting the State in meeting these mandates. The AB 32 Scoping Plan, prepared by CARB pursuant to AB 32, notes that local governments have broad influence and, in some cases, exclusive authority over activities that result in GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and City government operations. In recognition of the important role local governments will play in the successful implementation of AB 32, the AB 32 Scoping Plan identifies a GHG emission reduction target for local governments of 15 percent below 2005 levels by 2020 to match the statewide reduction target and to mitigate their impacts on climate change.

Recognizing the important role and responsibility that local governments have in reducing GHG emissions and mitigating their potential climate change impacts, the City has prepared this CAP. This chapter describes the purpose, scope, and content of Grover Beach's CAP, and its relationship to the General Plan and CEQA. This chapter also summarizes the scientific and regulatory framework under which this plan has been developed.

1.1 Purpose and Scope

The City's CAP is a long-range plan to reduce GHG emissions from community-wide activities and City government operations within Grover Beach to support the State's efforts under AB 32 and to mitigate the community's contribution to global climate change. Specifically, the CAP does the following:

- Summarizes the results of the *City of Grover Beach 2005 Greenhouse Gas Emissions Inventory Update*, which identifies the major sources and quantities of GHG emissions produced within Grover Beach and forecasts how these emissions may change over time.
- Identifies the quantity of GHG emissions that Grover Beach will need to reduce to meet its target of 15 percent below 2005 levels by the year 2020, consistent with AB 32.
- Sets forth City government and community-wide GHG reduction measures, including performance standards which, if implemented, would collectively achieve the specified emission reduction target.

1.0 INTRODUCTION

- Identifies proactive strategies that can be implemented to help Grover Beach prepare for anticipated climate change impacts.
- Sets forth procedures to implement, monitor, and verify the effectiveness of the CAP measures and adapt efforts moving forward as necessary.

In addition to reducing Grover Beach's GHG emissions consistent with AB 32 and mitigating the community's contribution to global climate change, implementation of the CAP will help achieve multiple community-wide goals, such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life. The CAP may also be utilized to tier and streamline the analysis of GHG emissions of future development within Grover Beach pursuant to State CEQA Guidelines Sections 15152 and 15183.5 (refer to Section 1.5, *Relationship to CEQA*).

1.2 Content

The CAP is organized into the following chapters:

1.0 Introduction – describes the purpose, scope, and content of Grover Beach's CAP. It also summarizes the scientific and regulatory framework under which this plan has been developed.

2.0 GHG Emissions and Reduction Target – identifies the sources of GHG emissions in Grover Beach, quantifies emissions for a baseline year (2005), and forecasts how emission levels would change through 2020. This chapter also quantifies the GHG emissions reduction target for the year 2020.

3.0 Climate Action Measures – organizes the CAP measures into the following focus areas: City government operations, energy, transportation and land use, off-road, and solid waste. Each GHG reduction measure is presented with implementation actions, estimated GHG reductions in 2020, and estimated cost and future savings.

4.0 Adaptation – includes a discussion of modeled climate change predictions, an urban systems assessment, a vulnerability assessment, and adaptation measures to prepare for and minimize the risk associated with anticipated climate change impacts.

5.0 Implementation and Monitoring – sets forth procedures to implement and monitor the individual CAP measures, evaluate the CAP's performance, and amend the plan if it is not achieving targeted reduction levels. It also identifies potential sources of funding to implement the CAP.

1.3 Background and Planning Process

In 2007, the San Luis Obispo County Air Pollution Control District (APCD) convened a committee of agency stakeholders (Stakeholder Committee) from the cities of Atascadero, Arroyo Grande, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo and the County of San Luis Obispo to initiate a discussion on climate change, including science,

policy, funding, mitigation, adaptation, and public engagement. The APCD also coordinated the preparation of GHG emissions inventories for each of the jurisdictions. Both the City and County of San Luis Obispo received federal stimulus funds to support the development of their CAPs. San Luis Obispo County approved its EnergyWise Plan in November 2011, and the City of San Luis Obispo adopted its Climate Action Plan in July 2012. The APCD worked with the remaining six cities to secure funds for individual CAPs, including the City of Grover Beach CAP, through the Pacific Gas and Electric Company (PG&E) Green Communities Program, Southern California Gas Company (SoCalGas), and APCD's mitigation grant funding.

City staff and its consultants worked with members of the community and elected officials to develop the CAP. The public outreach program involved two community workshops that introduced the project gathered input and ideas for the document and on potential GHG reduction measures. A virtual town hall also provided an opportunity for community members to evaluate a preliminary set of GHG reduction measures and suggest additional ideas. Public outreach also included posting project information and updates to the project website (www.centralcoastghgplanning.com) and eNewsletter announcements. Public comment was also considered during Planning Commission and City Council meetings.

1.4 Relationship to the General Plan

The General Plan expresses the community's vision for the future in Grover Beach and provides a basis for decision-making for land use and development actions. It consists of an organized set of goals, policies, and implementation programs that guide both the distribution of land uses and the way land is used. In regards to climate change, the Land Use Element of the General Plan identifies Goal LU-27, to reduce GHG emissions and to improve energy efficiency. To achieve this goal, policies LU-27.1 and LU-27.2 and their implementation measures direct the City to develop a CAP to reduce GHG emissions, and includes the following language:

- ***LU-27.1 Greenhouse gas reduction goal.*** *The City shall work with the Air Resources Board and the San Luis Obispo County Air Pollution Control District to comply with statewide greenhouse gas reduction goals as established in the Global Warming Solutions Act of 2006 (AB 32) for 2020, and subsequent goals.*

Implementation Measures

- *Work with the Air Resources Board and the SLO County APCD to comply with statewide greenhouse gas reduction goals as established by the Global Warming Solutions Act of 2006 which requires a reduction of emissions to the 1990 levels by the year 2020 and additional reductions extending long-term to 2050.*
- *Complete the GHG emissions inventory of municipal operations and the community wide emissions. Using this, develop the Climate Action Plan consistent with the requirements of AB32 and SB 375 (See policy LU-27.2). Such a plan should consider City participation in the Climate Action Registry, ridesharing programs and renewable energy programs, and the potential effects of sea level rise that may result from climate change.*

- **LU-27.2 Climate Action Plan.** *The City shall comply with the relevant provisions of State law (i.e. AB 32 and SB 375) to minimize the effect of citywide greenhouse gas emissions associated with buildout of the General Plan. This shall be achieved through the preparation and implementation of a Climate Action Plan.*

Implementation Measures

- *Prepare a Climate Action Plan consistent with the requirements of AB32 and SB375.*

In addition to fulfilling the General Plan policies above, this CAP incorporates and/or builds on the General Plan policies and implementation programs that would reduce Grover Beach's GHG emissions.

1.5 Relationship to CEQA

According to the California Natural Resources Agency (2009) and the State's Office of the Attorney General (2009), GHG emissions may be best analyzed and mitigated at the programmatic level (i.e., in a GHG reduction plan/CAP). In 2009, the California Natural Resources Agency amended the State CEQA Guidelines to add a new provision, Section 15183.5, which provides a framework for programmatic GHG emissions reduction plans (i.e., a CAP). Section 15183.5 states a plan for the reduction of GHG emissions should:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the GHG emissions resulting from sources in the community;
- Identify a suite of specific, enforceable measures that, collectively, will achieve the emissions targets;
- Establish a mechanism to monitor the plan's progress and to require amendment if the plan is falling short; and
- Be adopted in a public process following environmental review.

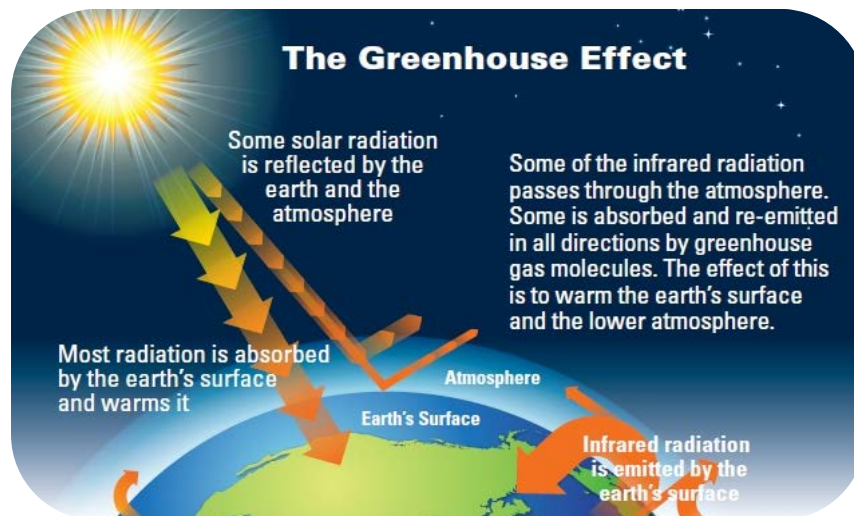
This CAP was developed to be consistent with State CEQA Guidelines Section 15183.5. Once the CAP is adopted following environmental review, a lead agency may determine that projects that are consistent with the CAP will not have significant GHG-related impacts, thereby shortening the CEQA process, which can save time and money for these projects. **Appendix C** contains a worksheet that project applicants may use to demonstrate project-level compliance. If a project is found to be inconsistent with the CAP, the APCD thresholds discussed in Section 1.9.3 should be applied.

1.6 Scientific Background

In order to make meaningful and effective decisions regarding the mitigation of GHG emissions and adaptation to anticipated changes in climate, it is important to understand the science under which this CAP has been developed. This section provides a brief introduction to the scientific research efforts to understand how climate change occurs and its implications.

Global climate change refers to changes in the average climatic conditions on Earth as a whole, including changes in temperature, wind patterns, precipitation, and storms. Global warming, a related concept, is the observed increase in average temperature of the Earth's surface and atmosphere caused by increased GHG emissions, which can contribute to changes in global climate patterns. GHGs, such as water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and ozone (O₃), are gases in the Earth's atmosphere that play a critical role in determining the Earth's surface temperature. Specifically, GHGs allow high-frequency solar radiation to enter the Earth's atmosphere, but trap the low frequency, long wave energy which is radiated back from the Earth to space, resulting in a warming of the atmosphere. The trapping of heat at the Earth's surface is known as the "greenhouse effect" (refer to **Figure 1-1**).

Figure 1-1: The Greenhouse Effect

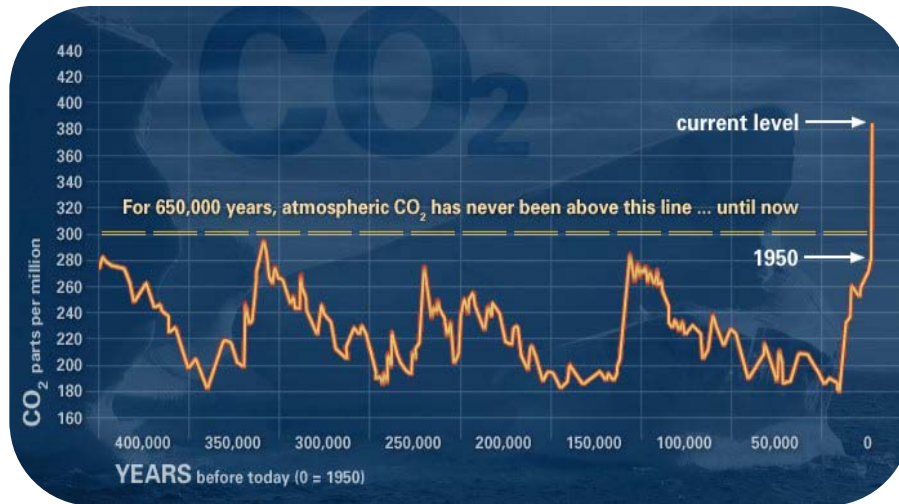


Source: National Oceanic & Atmospheric Administration (NOAA), 2009

GHGs are the result of both natural and anthropogenic activities. The consumption of fossil fuels for power generation and transportation, forest fires, decomposition of organic waste, and industrial processes are the primary sources of GHG emissions. Without human intervention, the Earth maintains an approximate long-term balance between the emission of GHGs into the atmosphere and its storage in oceans and terrestrial ecosystems. Following the industrial revolution, however, increased combustion of fossil fuels (e.g., gasoline, diesel, coal, etc.) and other industrial processes have contributed to the rapid increase in atmospheric levels of GHGs (refer to **Figure 1-2**) (NOAA, 2009). This increase in GHGs correlates with the recent increase

in global average temperature (which has risen approximately 1.4°F since the early 20th century) (IPCC, 2007; NOAA, 2009).

Figure 1-2: Historic Fluctuations and Recent Increases in Atmospheric Carbon Dioxide



This graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric CO₂ has increased since the Industrial Revolution (NASA, 2011).

The principal GHGs that enter the atmosphere as a result of human activities are discussed below.

- **Carbon dioxide (CO₂)** is released into the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., cement production) and deforestation. Carbon dioxide is also removed from the atmosphere (or “sequestered”) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH₄)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from agricultural practices, such as the raising of livestock, and by the decomposition of organic waste in landfills.
- **Nitrous oxide (N₂O)** is emitted during agricultural and industrial activities, as well as during the burning of fossil fuels and solid waste.
- **Fluorinated gases** (i.e., hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) are synthetic GHGs that are emitted from a variety of industrial processes (e.g., aluminum production) and used in commercial, industrial, and consumer products (e.g., automobile air conditioners and refrigerants). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as “high global warming potential” gases.

Each GHG has a different potential for trapping heat in the atmosphere, called global warming potential. For example, one pound of methane has 21 times more heat capturing potential than

one pound of carbon dioxide. To simplify reporting and analysis of GHGs, GHG emissions are typically reported in metric tons of carbon dioxide equivalent (MT CO₂e) units. When dealing with an array of emissions, the gases are converted to their carbon dioxide equivalents for comparison purposes. The global warming potentials for common GHGs are shown in **Table 1-1**.

Table 1-1: Global Warming Potential of GHGs

GHG	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Oxide (N ₂ O)	310
Hydrofluorocarbons (HFCs)	140-11,700
Perfluorocarbons (PFCs)	6,500-9,200
Sulfur Hexafluoride (SF ₆)	23,900

Notes: Each of the GHGs listed above differs in its ability to absorb heat in the atmosphere, or in its global warming potential. The values presented above are based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report and United Nations Framework Convention on Climate Change reporting guidelines (IPCC, 1996). Although the IPCC Fourth Assessment Report presents different estimates, the current inventory standard relies on the Second Assessment Report's intensity factors to comply with reporting standards and consistency with regional and national inventories (USEPA, 2010).

1.7 Climate Change Impacts

Increases in the globally averaged atmospheric concentration of GHGs will cause the lower atmosphere to warm, in turn inducing a myriad of changes to the global climate system. These large-scale changes will have unique and potentially severe impacts in the western United States, California, and the central coast region. Current research efforts coordinated through CARB, California Energy Commission, California Environmental Protection Agency (EPA), University of California system, and other entities are examining the specific changes to California's climate that will occur as the Earth's surface warms.

The best available climate models indicate that climate change could impact the natural environment in California in the following ways, among others (California Natural Resources Agency, 2009):

- Rising sea levels along the California coastline caused by ocean expansion and glacier melt
- Extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent



1.0 INTRODUCTION

- An increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality
- Reduced snow pack and stream flow in the Sierra Nevada Mountains, affecting winter recreation and water supplies
- Potential increase in the severity and historical pattern of winter storms, affecting peak stream flows and flooding
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield
- Changes in distribution of plant and wildlife species brought about by changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects

1.8 Implications for Grover Beach

Rising temperatures affect local and global climate patterns, and these changes are forecasted to manifest themselves in a number of ways that may impact the central coast region. As further discussed in Chapter 4, *Adaptation*, according to *ClimateWise: Integrated Climate Change Adaptation Planning in San Luis Obispo County in November 2010* (ClimateWise) potential climate changes that could occur in Grover Beach by the end of this century include:

- Increased temperatures
- Seal level rise
- Storm surges
- Erosion
- Changed precipitation

1.9 Regulatory Background

This section summarizes the federal, state, and regional legislation, regulations, policies, and plans that have guided the preparation and development of this CAP.

1.9.1 FEDERAL

Clean Air Act. The U.S. EPA is the federal agency responsible for implementing the Clean Air Act. The U.S. Supreme Court ruled in its decision in *Massachusetts et al. v. Environmental Protection Agency et al.*, issued on April 2, 2007, that carbon dioxide is an air pollutant as defined under the Clean Air Act and that the U.S. EPA has the authority to regulate emissions of GHGs as pollutants. In 2011, the U.S. EPA began regulating GHG emissions from new power plants and refineries through a set of New Source Performance Standards. These regulations are found in 40 CFR Part 60 and apply to new, modified and reconstructed affected facilities in specific source categories such as manufacturers of glass, cement, rubber tires and wool fiberglass.

Energy Independence and Security Act. The Energy Independence and Security Act of 2007 includes several provisions that will increase energy efficiency and the availability of renewable energy, which in turn will reduce GHG emissions. First, the Act sets a Renewable Fuel Standard that requires fuel producers to use at least 36 billion gallons of biofuel by 2022. Second, it increased Corporate Average Fuel Economy (CAFE) Standards to require a minimum average fuel economy of 35 miles per gallon for the combined fleet of cars and light trucks by 2020. Third, it includes a variety of new standards for lighting and for residential and commercial appliance equipment, including residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

1.9.2 STATE OF CALIFORNIA

The State of California has been proactive in working to reduce emissions and has a long history of leadership in addressing energy and climate issues spanning the last 40 years. In 1988, AB 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission as the lead agency for climate change issues in California. Since that time, numerous initiatives in California have addressed climate change and energy efficiency, the majority of legislation passed since 2000. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created targets and regulations that will directly lead to reductions in GHG emissions. These initiatives are described below.

Executive Order S-3-05. Executive Order S-3-05, issued in 2005, was the first comprehensive state policy to address climate change. It established ambitious GHG reduction targets for the State: reduce GHG emissions to 2000 levels by 2010, to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. This Executive Order is binding only for State agencies and has no force of law for local governments. However, S-3-05 is important for two reasons. First, it obligated State agencies to implement GHG emission reduction strategies. Second, the signing of the Order sent a clear signal to the Legislature about the framework and content for legislation to reduce GHG emissions as a necessary step toward climate stabilization.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). AB 32 codified the State's 2020 GHG emissions target by directing CARB to reduce California's statewide emissions to 1990 levels by 2020. AB 32 also required CARB to develop a policy plan for reaching the 2020 emissions target and to adopt and enforce regulations to implement the plan. The resulting AB 32 Scoping Plan was adopted by CARB in December 2008. Key elements of the plan for achieving the 2020 target include:

- Adopting and implementing measures pursuant to existing state laws and policies, including California's goods movement measures and the Low Carbon Fuel Standard
- Expanding energy efficiency programs and green building practices
- Reducing methane emissions at landfills
- Developing a California cap-and-trade program

1.0 INTRODUCTION

- Establishing and seeking to achieve reduction targets for transportation-related GHG emissions
- Increasing waste diversion, composting, and commercial recycling toward zero-waste
- Strengthening water efficiency programs
- Preserving forests that sequester carbon dioxide

Although the AB 32 Scoping Plan does not identify specific reductions for local governments, it identifies overall reductions from local government operations and land use decisions as a strategy to meet the 2020 target. The AB 32 Scoping Plan states that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. It further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. However, the AB 32 Scoping Plan stopped short of identifying mandatory targets for local government compliance. Instead, it encourages local governments to adopt a target for City government and community-wide emissions that parallels the State's AB 32 target and reduces emissions by approximately 15 percent by 2020.

Senate Bill 97. SB 97 (2007) established that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis and required the Governor's Office of Planning and Research to develop guidelines to analyze GHG impacts under CEQA. The guidelines were adopted on December 31, 2009, requiring lead agencies to analyze GHG emissions and the effects of GHG emissions during CEQA review.

Assembly Bill 1493 (Pavley Regulations). AB 1493 (referred to as Pavley I) (2002) directed CARB to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction by 2012 and 30 percent by 2016.

Executive Order S-1-07 (Low Carbon Fuel Standard). This 2007 order requires fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020.

Senate Bill 375. SB 375 (2008) supports implementation of AB 32 by aligning regional transportation planning efforts with land use and housing allocations in order to reduce transportation-related GHG emissions. Specifically, SB 375 directed CARB to set regional GHG emissions targets for passenger vehicles and light trucks for the years 2020 and 2035 for each Metropolitan Planning Organization (MPO) region, which were adopted in February 2011. The San Luis Obispo Council of Governments (SLOCOG), Grover Beach's MPO, has adopted reduction targets for per capita emissions from passenger vehicles of 8 percent below baseline (2005) for the years 2020 and 2035 (CARB, 2011). These targets apply to the SLOCOG region as a whole, and not to individual cities or sub-regions. In 2008, GHG emissions from passenger vehicles in the San Luis Obispo region were approximately 16.5 pounds CO₂e per capita.

Therefore, SLOCOG must reduce emissions to at least 15.18 pounds CO₂e per capita by 2020 and maintain or further reduce that level through 2035 to meet the target. SLOCOG's 2010 Regional Transportation Plan and Preliminary Sustainable Communities Strategy (RTP-PSCS), adopted in 2010, details how the region will meet the target (refer to the discussion of SLOCOG's 2010 RTP-PSCS in Section 1.9.3 below).

Senate Bill 1078, Senate Bill 107, and Senate Bill 2X (Renewables Portfolio Standard).

Established in 2002 under SB 1078, and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard required investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they achieved 20 percent by 2010. SB 2X raises the target from the current 20 percent, requiring private and public utilities to obtain 33 percent of their electricity from renewable energy sources by 2020.

Senate Bill 1368. SB 1368 (2006) directs the California Energy Commission and the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future electricity used in California, regardless of whether it is generated in-state or purchased from other states.

Assembly Bill 811. AB 811 (2008) authorizes California cities and counties to designate districts within which willing property owners may enter into contractual assessments to finance the installation of renewable energy generation and energy efficiency improvements that are permanently fixed to the property. These financing arrangements would allow property owners to finance renewable energy generation and energy efficiency improvements through low-interest loans that would be repaid as an item on the property owner's property tax bill.

California Green Building Code. The California Green Building Code (2008) (the CALGreen Code) is the statewide green building code, which was developed to provide a consistent approach for green building within California. It lays out minimum requirements for newly constructed buildings in California, which will reduce GHG emissions through improved efficiency and process improvements. It requires builders to install plumbing that cuts indoor water use by as much as 20 percent, divert 50 percent of construction waste from landfills to recycling, and use low-pollutant paints, carpets, and floors.

California Code of Regulations Title 24, Part 6. Although it was not originally intended specifically to reduce GHG emissions, California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption, which in turn reduces fossil fuel consumption and associated GHG emissions. The standards are updated periodically to allow consideration and possible incorporation of new energy-efficient technologies and methods. The California Energy Commission estimates that the 2008 standards reduce consumption by 10 percent for residential buildings and 5 percent for commercial buildings, relative to the previous standards. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by 25 percent for residential buildings and 30 percent for commercial buildings, relative to the 2008 standards. These percentage savings

relate to heating, cooling, lighting, and water heating only and do not include other appliances, outdoor lighting that is not attached to buildings, plug loads, or other energy uses.

Assembly Bill 341. AB 341 (2011) establishes a new policy goal of the State of California to divert at least 75 percent of solid waste generated by the year 2020 in an effort to reduce GHG emissions. It also provides for mandatory commercial and multi-family residential recycling, and requires cities and counties to add a commercial and multi-family residential recycling element to their existing resource reduction plans.

1.9.3 REGIONAL

SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT

The APCD has primary responsibility for the development and implementation of rules and regulations designed to attain the National Ambient Air Quality Standards and California Ambient Air Quality Standards, as well as the permitting of new or modified sources, development of air quality management plans, and adoption and enforcement of air pollution regulations within San Luis Obispo County, which is located within the South Central Coast Air Basin. The APCD regulates most air pollutant sources, except for mobile sources, which are regulated by CARB or California EPA. State and local government projects, as well as projects proposed by the private sector, are subject to APCD requirements if the sources are regulated by the APCD.

The AB 32 Scoping Plan does not provide an explicit role for local air districts in implementing AB 32, but it does state that CARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical guidance for CEQA documents.

In March 2012, the APCD adopted GHG thresholds in order to help lead agencies meet the GHG reduction goals of AB 32. The APCD's approach to developing a threshold of significance for GHG emissions was to identify the GHG emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. Different thresholds were developed to accommodate various development types and patterns and are summarized below in **Table 1-2**.

Table 1-2: SLOAPCD GHG Significance Thresholds

GHG Emission Source Category	Operational Emissions
Residential and Commercial Projects	Compliance with Qualified GHG Reduction Strategy OR Bright-Line Threshold of 1,150 MT CO ₂ e/yr OR Efficiency Threshold of 4.9 MT CO ₂ e/SP*/yr
(Industrial) Stationary Sources	10,000 MT of CO ₂ e/yr

*SP = Service Population (residents + employees). YR = Year

For projects other than stationary sources, compliance with either a Qualified GHG Reduction Strategy, or with the Bright-Line (1,150 CO₂e/yr) or Efficiency Threshold (4.9 MT CO₂e/SP/yr) would result in an insignificant determination, and in compliance with the goals of AB 32. The construction emissions of projects will be amortized over the life of a project and added to the operational emissions. Emissions from construction-only projects (e.g. roadways, pipelines, etc.) will be amortized over the life of the project and compared to an adopted GHG Reduction Strategy or the Bright-Line Threshold only.

The APCD recommends that lead agencies within the county use the adopted GHG thresholds of significance when considering the significance of GHG impacts of new projects subject to CEQA. Further, projects with GHG emissions that exceed the thresholds will need to implement mitigation to reduce the impacts to a less than significant level, which can be accomplished through a Mitigated Negative Declaration or an Environmental Impact Report.

As identified in the APCD thresholds, if a project is consistent with an adopted Qualified GHG Reduction Strategy (e.g., CAP meeting criteria identified in Section 1.5 above) that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emission impacts. This approach is consistent with CEQA Guidelines Section 15183.5.

As discussed in Section 1.5 above, this CAP was developed to be consistent with CEQA Guidelines Section 15183.5 to mitigate emissions and climate change impacts and will therefore serve as a Qualified GHG Reduction Strategy for the City of Grover Beach.

SAN LUIS OBISPO COUNCIL OF GOVERNMENTS

SLOCOG is the local Council of Governments with responsibility for regional planning for San Luis Obispo County. SLOCOG's planning efforts address regional issues relating to transportation, land use and urban form, housing, environment, economic development, regional public facilities, and climate change. Plans that SLOCOG has adopted that support GHG emissions reductions in Grover Beach are described below.

Rideshare Program. The Rideshare Program is a division of SLOCOG that focuses on outreach and events to promote bicycling, walking, carpooling, vanpooling, and riding the bus. Some of the major programs include:

- Bike month and Rideshare month.

1.0 INTRODUCTION

- **Transportation Choices Program** – This is a free program in San Luis Obispo County offered to businesses and organizations that encourage their employees to use sustainable transportation. The goal of the Transportation Choices Program is to equip employers with the tools needed to promote positive change in employee commuting habits.
- **Mobility Management Program** - The goal of the program is to bridge the communications gap between Public Transit Operators and Social Services Agencies.
- **Safe Routes to School Program** - Safe Routes to School is a national and international movement to enable and encourage students to walk and bicycle to school. Through the use of education, encouragement, enforcement, engineering and evaluation, programs and projects are being developed to create a safe, healthy and fun environment for walking and biking to school.
- **Senior Transportation Choices Program** - Rideshare works hand-in-hand with seniors throughout the county, providing tools and education on how to use public transportation and community transportation services. Through our Senior Transportation Choices Program, we provide transportation information, Transit Field Trips and personalized trip planning.

Planning for Alternative Modes. SLOCOG focuses planning efforts to support the use of the following alternative modes of transportation:

- **Bikes** – SLOCOG supports and promotes bicycling as a viable transportation choice. SLOCOG staff attend Bicycle Advisory Committees in the City of San Luis Obispo and San Luis Obispo County. SLOCOG staff also review and advise jurisdictions on approval of Bicycle Transportation Account (BTA) eligible Bicycle Plans.
- **Pedestrians** – SLOCOG is in the process of developing the Northern San Luis Obispo County Salinas River Corridor Anza Trail Master Plan.
- **Bus** – SLOCOG works with all transit providers to coordinate services. The Transit Operators Group is an Ad Hoc committee of transit operators, contractors, and SLOCOG staff. Coordinating projects include the Coordinated Human Services Public Transportation Plan, the Region Wide Fare Improvement Study, and the Long Range Transit Plan.
- **Rail** – SLOCOG coordinates and prepares agendas for the Coast Rail Coordinating Council. The purpose of the Coast Rail Coordinating Council is to improve the frequency and speed of passenger trains on the coast route between San Francisco and Los Angeles.

Community 2050 Regional Blueprint. Community 2050 is a collaborative planning effort that utilizes scenario planning to study long-range regional growth. Community 2050 outlines a program to improve multimodal mobility through a combination of strategies and investments to accommodate growth in transportation demand and reduce congestion that will contribute to a strong economy.

2010 Regional Transportation Plan – Preliminary Sustainable Communities Strategy (RTP-PSCS). The RTP-PSCS, most recently updated in 2010, is a comprehensive plan guiding transportation policy for the region and makes recommendations concerning improvements to the existing transportation network of highways, transit, air, water, rail and bicycling. The plan helps position the region to achieve smarter, more sustainable growth that meets the transportation needs of the growing population and changing region. The primary purpose of the RTP-SCS is to integrate sustainable communities strategies developed under the Community 2050 Regional Blueprint and continue progress in accomplishing the intermodal mix of policies, programs and projects in the adopted RTP, Vision 2025, adopted in 2005. The 2010 RTP-PSCS contains a “Preliminary” Sustainable Communities Strategy consistent with the purpose and intent of state bills related to GHG emissions and climate change, including AB 32 and the SB 375.

2012 SCS-Compliant RTP Update. SLOCOG is currently working to prepare a 2012 SCS-complaint RTP. This update will build upon and further refine the efforts of the 2010 RTP-PSCS to adjust alternatives to satisfy State requirements of SB 375. SLOCOG must reduce per capita GHG emissions from passenger vehicles by 8 percent relative to 2005 levels in 2020 and 2030.

LOCAL GOVERNMENT ROLES AND RESPONSIBILITIES

The AB 32 Scoping Plan establishes a framework for achieving statewide GHG reductions required by AB 32. Specifically, the AB 32 Scoping Plan describes a list of measures that the State will undertake, and the anticipated GHG reductions associated with these measures, by 2020. Because the State does not have jurisdictional control over all of the activities that produce GHG emissions in California, the AB 32 Scoping Plan articulates a unique role for local governments in helping to achieve the statewide GHG reduction target, noting their broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and City government operations. As such the AB 32 Scoping Plan recommends that local governments reduce GHG emissions from both their City government operations and community at large.

CHAPTER 2

GHG EMISSIONS AND REDUCTION TARGET

2.0 GHG Emissions and Reduction Target

A GHG emissions inventory identifies the major sources and quantities of GHG emissions produced by community-wide activities and City government facilities and operations within a jurisdiction's boundaries for a given year. Estimating GHG emissions enables local governments to establish an emissions baseline, track emissions trends, identify the greatest sources of GHG emissions within their jurisdiction, set targets for future reductions, and create an informed mitigation strategy based on this information.

This chapter summarizes the results of the GHG Emissions Inventory (2013). The GHG Emissions Inventory includes a 2005 baseline inventory of GHG emissions resulting from community-wide activities and City government facilities and operations within Grover Beach. It also includes a 2020 business-as-usual forecast of how emissions would change over time as a result of population and job growth if consumption trends and efficiencies remained at their 2005 levels, absent of any new policies or actions that would reduce emissions. Since 2005, there have been several State regulations and local initiatives that have been implemented that will reduce Grover Beach's GHG emissions. Therefore, this chapter also presents a 2020 adjusted forecast to account for the impact of these measures to provide a more accurate picture of future emissions growth in 2020. In addition, this chapter identifies the City's GHG emissions reduction target for the year 2020 consistent with AB 32. **Appendix A** contains the complete GHG Emissions Inventory and supporting documentation.

2.1 2005 Baseline GHG Emissions

This section summarizes the methodology used to complete the 2005 baseline inventory of community-wide activities and City government facilities and operations, and the results.

2.1.1 METHODOLOGY

The 2005 baseline inventory quantifies the amount of GHG emissions that occurred within the City's jurisdictional boundary in the year 2005. It includes a community-wide inventory that details the sources and quantities of GHG emissions resulting from activities from the Grover Beach community as a whole, and a City government operations inventory that identifies the sources and quantities of emissions resulting from the City of Grover Beach's operations and facilities. The City government operations inventory is a subset of the community-wide inventory, such that the City government's emissions are included within the community-wide inventory.

The community-wide inventory is divided into the following sectors, or categories of emissions sources: residential energy use, commercial and industrial energy use, transportation, off-road vehicles and equipment, and solid waste. The City government operations inventory provides a more detailed analysis of emissions resulting from City-owned or -operated buildings and facilities, fleet vehicles, and streetlights and traffic signals; water delivery; wastewater; solid waste; and employee commute travel.

2.0 GHG EMISSIONS AND REDUCTION TARGET

The City government operations inventory follows the *Local Government Operations Protocol* (version 1.1), which was adopted in 2010 by CARB and serves as the national standard for quantifying and reporting GHG emissions from local government operations. The community-wide inventory follows the *Association of Environmental Professionals (AEP) California Community-wide GHG Baseline Inventory Protocol (AEP Protocol)* (June 2011) and *ICLEI International Local Government GHG Emissions Analysis Protocol (IEAP)* (October 2009). These protocols provide standard accounting principles, boundaries, quantification methods, and procedures for reporting GHG emissions. Like all emissions inventories, this inventory must rely on the best-available data and calculation methodologies at the time of preparation, and therefore, represents a best estimate of GHG emissions following standard methodologies. As protocols are updated, as better data and calculation methodologies become available, the inventory can be updated and improved. Nevertheless, the findings of this analysis provide a solid basis upon which Grover Beach is planning and taking action to reduce its GHG emissions.

2.1.2 COMMUNITY-WIDE GHG EMISSIONS

In 2005, the Grover Beach community emitted approximately 48,169 MT CO₂e as a result of activities that took place within the residential energy use, commercial and industrial energy use, transportation, off-road, and solid waste sectors. As shown in **Figure 2-1** and **Table 2-1**, the transportation sector was the largest contributor of GHG emissions, generating approximately 18,549 MT CO₂e, or 39 percent of total 2005 emissions. Transportation sector emissions are the result of diesel and gasoline fuel used in on-road vehicles traveling to and/or from locations within Grover Beach.¹ Electricity and natural gas consumption within the residential sector was the second largest contributor, generating 15,915 MT CO₂e, or 33 percent of the total emissions. Electricity and natural gas consumption in Grover Beach's commercial and industrial sector produced 6,033 MT CO₂e, or 13 percent of total community-wide emissions. Emissions from off-road vehicles and equipment (5,034 MT CO₂e, or 10 percent) and solid waste sent to landfills (2,638 MT CO₂e, or five percent) accounted for the remainder of community-wide emissions.

¹ Excludes pass-through trips that do not have an origin or destination within the city. Trips to the State beach were not included in the inventory. Emissions take into account the regional mix of vehicle classes and model years, as well as ambient conditions and travel speeds that determine fuel efficiency. Types of emissions accounted for include: running exhaust, idle exhaust, starting exhaust, diurnal, resting loss, running loss, and hot soak. Refer to **Appendix A** for further information.

Figure 2-1: Community-wide GHG Emissions by Sector (2005)

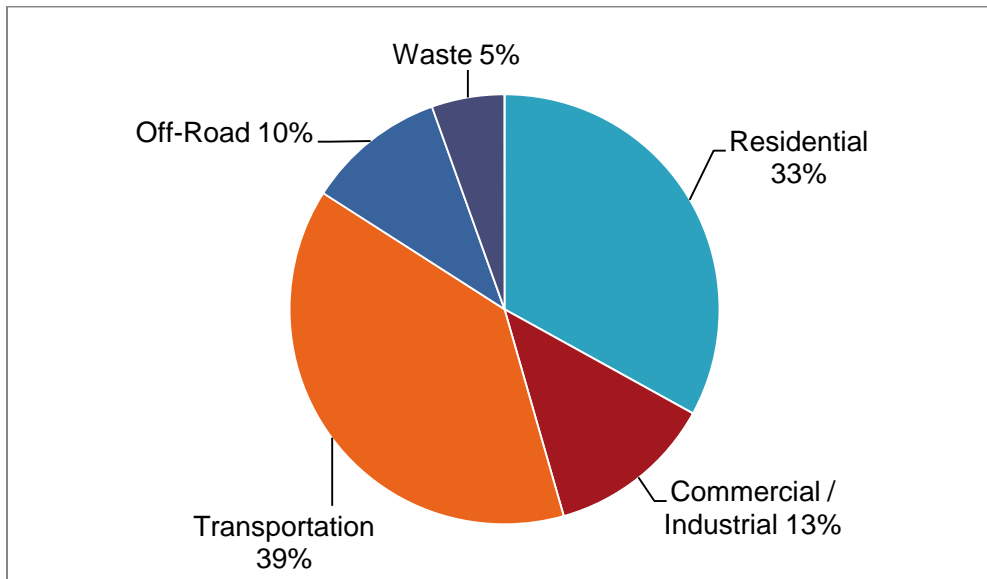


Table 2-1: Community-wide GHG Emissions by Sector (2005)

Sector	Description	GHG Emissions (MT CO ₂ e)	Percent of Total
Residential	Electricity and natural gas used in homes	15,915	33%
Commercial/Industrial	Electricity and natural gas used in commercial and industrial buildings	6,033	13%
Transportation	Gasoline and diesel used in on-road vehicles	18,549	39%
Off-Road Vehicles and Equipment	Gasoline, diesel, and compressed natural gas used in off-road vehicles and equipment	5,034	10%
Solid Waste	Methane from the decomposition of landfilled solid waste	2,638	5%
Total		48,169	100%

2.1.3 CITY GOVERNMENT OPERATIONS GHG EMISSIONS

In 2005, City government operations generated approximately 1,344 MT CO₂e. This quantity represents approximately three percent of Grover Beach's total community-wide GHG emissions. As shown in **Figure 2-2** and **Table 2-2**, fuel consumption from the City's fleet vehicles (generating approximately 71 percent of total emissions) was the largest contributor to the City's emissions. Emissions from water delivery (15 percent) and electricity and natural gas used at City buildings (seven percent) were also significant sources of emissions, as were emissions from electricity used for streetlights and traffic signals (five percent). Emissions from wastewater facilities (one percent), employee commute (less than one percent) and solid waste (less than one percent) accounted for the remainder of the City's emissions.

Figure 2-2: City Government GHG Emissions by Sector (2005)

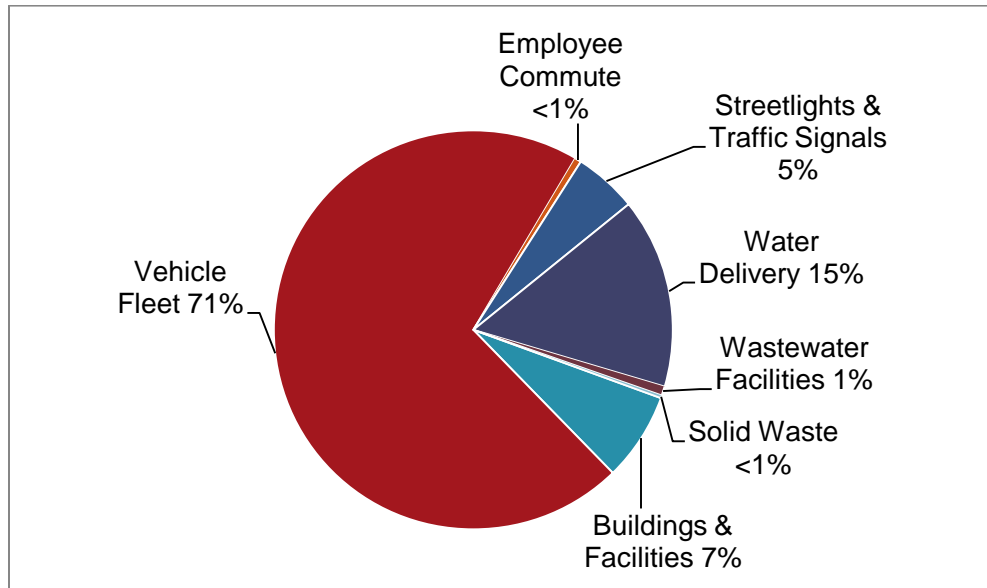


Table 2-2: City Government GHG Emissions by Sector (2005)

Sector	Description	GHG Emissions (MT CO ₂ e)	Percent of Total
Vehicle Fleet	Diesel and gasoline consumption and vehicle type	952	71%
Employee Commute	Annual vehicle miles travelled (VMT) from sample of employee commuting patterns	7	<1%
Buildings and Facilities	Electricity and natural gas consumption in City-owned or – operated buildings and facilities	96	7%
Streetlights & Traffic Signals	Electricity used to power streetlights, traffic signal lights, and other public outdoor lighting	69	5%
Solid Waste	Annual waste tonnage sent to landfill	3	<1%
Water Delivery	Electricity used for water transport resulting from City operations	207	15%
Wastewater Facilities	Electricity consumption from wastewater facilities	10	1%
Total		1,344	100%

2.2 2020 GHG Emissions Forecast

2.2.1 METHODOLOGY

The GHG emissions forecast provides a “business-as-usual estimate,” or scenario, of how emissions will change in the year 2020 if consumption trends and behavior continue as they did in 2005, absent any new federal, state, regional, or local policies or actions that would reduce emissions. The year 2020 was selected for the forecast to maintain consistency with AB 32.

The GHG emissions forecast is based on projected growth trends in population, jobs, and VMT and the assumption that the emissions per sector will change over time in proportion to population, jobs, and VMT. Population data and estimated growth for the year 2020 were obtained from the San Luis Obispo Council of Governments report, San Luis Obispo County 2040 Population, Housing & Employment Forecast (August 2011) and revised job data was obtained from the San Luis Obispo Council of Governments' March 6, 2013 staff report titled “Correction to the 2040 Regional Growth Forecast Employment Estimates and Potential Changes to Regional Housing Needs Allocation.” VMT estimates from SLOCOG’s regional travel demand model for the year 2020 were provided by Fehr & Peers. The “mid-range” case for population growth was used for this forecast.

2.2.2 2020 BUSINESS-AS-USUAL FORECAST

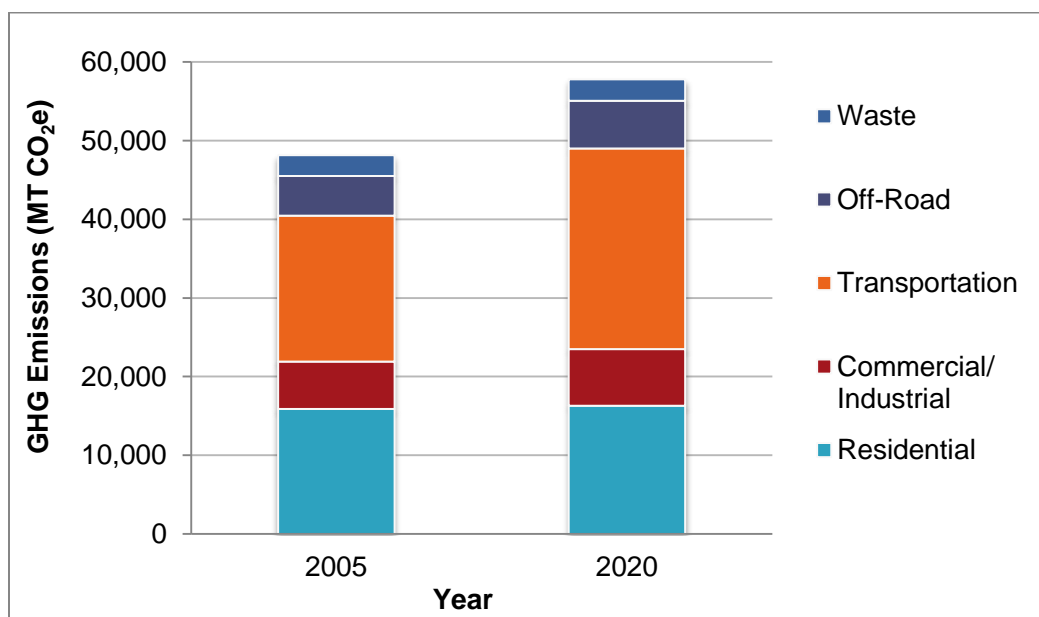
Under a business-as-usual scenario, Grover Beach’s GHG emissions are projected to grow by approximately 29 percent by the year 2020, from 48,169 MT CO₂e to 57,794 MT CO₂e. Emissions associated with the transportation sector are projected to experience the highest level of growth (37 percent). **Table 2-3** and **Figure 2-3** show the results of the forecast.

Table 2-3: 2020 Business-As-Usual GHG Emissions Forecast

Sector	2005 (MT CO ₂ e)	2020 (MT CO ₂ e)	Percent Change from 2005 to 2020
Residential	15,915	16,318	3%
Commercial / Industrial	6,033	7,206	19%
Transportation	18,549	25,481	37%
Off-Road	5,034	6,084	21%
Solid Waste	2,638	2,705	3%
Total	48,169	57,794	20%

*Refer to **Appendix A** for details

Figure 2-3: 2020 Business-As-Usual GHG Emissions Forecast



2.2.3 2020 ADJUSTED FORECAST

INCORPORATION OF STATE REDUCTIONS INTO FORECAST

The AB 32 Scoping Plan identifies several State measures that are approved, programmed, and/or adopted and will reduce GHG emissions within Grover Beach. These State measures require no additional local action. Therefore, these measures were incorporated into the forecast and reduction assessment to create an “adjusted forecast,” which provides a more accurate picture of future emissions growth and the responsibility of the City once State measures to reduce GHG emissions have been implemented. A brief description of each of these measures is provided below and the calculation details are located in **Appendix B** of this document. **Table 2-4** summarizes the reduction in local emissions that is anticipated to result.

Table 2-4: Summary of State Reductions

State Measure	2020 Reduction (MT CO ₂ e)*
Clean Car Standards, AB 1493 (Pavley I)	-3,384
Low-Carbon Fuel Standard (on-road transportation)	-2,209
Low-Carbon Fuel Standard (off-road vehicles)	-608
Title 24	-179
Renewable Portfolio Standard	-4,261
Total State Reduction	-10,641

*Refer to **Appendix B** for calculation details

Clean Car Standards, AB 1493 (Pavley I)

Signed into law in 2002, AB 1493 (Pavley I standard) requires vehicle manufactures to reduce GHG emissions from new passenger vehicles and light trucks from 2009 through 2016. The CARB anticipates that the Pavley I standard will reduce GHG emissions from new California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016. The Pavley I standard is expected to reduce transportation sector emissions in Grover Beach by approximately 3,384 MT CO₂e in 2020.

Low Carbon Fuel Standard

The Low Carbon Fuel Standard requires a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. Measured on a lifecycle basis, the carbon intensity represents the CO₂e emitted from each stage of producing, transporting, and using the fuel in a motor vehicle. This translates to an approximately nine percent (or 2,209 MT CO₂e) reduction in Grover Beach's on-road transportation sector GHG emissions and a 10 percent (or 608 MT CO₂e) reduction in its off-road sector GHG emissions in 2020 compared to business-as-usual levels.

Title 24

California Code of Regulations Title 24, Part 6: California's Energy Efficiency Standards are updated periodically to allow consideration and possible incorporation of new energy-efficient technologies and methods. The updates that have occurred since the 2005 baseline year and, therefore, were not included in the business-as-usual forecast, include the 2008 and 2013 Title 24 Energy Efficiency Standards. The California Energy Commission estimates that the 2008 standards reduce consumption by 10 percent for new residential buildings and five percent for new commercial buildings, relative to the 2005 standards. For projects implemented after January 1, 2014, the California Energy Commission estimates that the 2013 Title 24 energy efficiency standards will reduce consumption by 25 percent for new residential buildings and 30 percent for new commercial buildings, relative to the 2008 standards. The 2008 and 2013 Title 24 requirements would reduce emissions by approximately 179 MT CO₂e in 2020.²

Renewable Portfolio Standard

The State of California Renewable Portfolio Standard requires investor-owned utilities, electric service providers, and community choice aggregators to increase the portion of energy that comes from renewable sources to 33 percent by 2020. In order to calculate future emissions that take into account the Renewable Portfolio Standard, PG&E's 2020 emissions factor was applied (PG&E, 2011). The Renewable Portfolio Standard is anticipated to reduce Grover Beach's GHG emissions by approximately 4,261 MT CO₂e in 2020.

² The AB 32 Scoping Plan calls for the continuation of ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. Future updates to Title 24 standards for residential and non-residential alterations are not taken into consideration due to lack of data and certainty about the magnitude of energy savings that will be realized with each subsequent update.

2.0 GHG EMISSIONS AND REDUCTION TARGET

Sustainable Communities and Climate Protection Act – Senate Bill 375

SB 375, the Sustainable Communities and Climate Protection Act of 2008, enhances California's ability to reach its AB 32 target by aligning regional transportation planning efforts with land use and housing allocations in order to reduce transportation-related GHG emissions. As mentioned in Chapter 1, *Introduction*, SLOCOG must reduce per capita GHG emissions from passenger vehicles by eight percent relative to 2005 levels in 2020 and 2030.

While the outcome of SB 375 in terms of a reduction in VMT per capita is specified by the State, achievement of the target is dependent on regional and local actions and activities that are not regulated by the State. Many of these actions and activities are inextricably linked to local actions which rely on implementation assumptions that will need to be monitored to ensure effectiveness. Therefore, GHG reductions resulting from implementation of SB 375 have not been included as a State measure that would reduce GHG emissions within Grover Beach.

INCORPORATION OF LOCAL REDUCTIONS INTO FORECAST

In addition to the State measures described above, the City of Grover Beach has implemented a number of local measures since the 2005 baseline inventory year that will reduce the community's GHG emissions. It is important to note that local measures which rely on future implementation actions and assumptions are included in Chapter 3, *Climate Action Measures*, as they will need to be monitored to ensure effectiveness. A brief description of each of these local measures is provided below by topic area and the local reduction in GHG emissions in 2020 is summarized in **Table 2-5** (see **Appendix B** for supporting details).

Table 2-5: Summary of Local Reductions

Local Measure	2020 Reduction (MT CO ₂ e)
Energy	
Solar Energy Installation (Residential and Commercial)	-21
Low Income Weatherization	-12
City Government Energy Efficiency Upgrades	-129
Energy Efficient Traffic Signals	-40
Transportation and Land Use	
Increase Density and Diversity of Land Uses ¹	-5
Transit System Improvements	-8
Bicycle and Pedestrian Network Improvements	-97
Utilize Electric Vehicles	-1
Waste	
Construction and Demolition Debris Recycling	-157
Water	
Water Conservation Programs to Meet SB X7-7 Target	-23
Urban Greening	
Tree Planting	-1
Total Reduction from Local Measures	-494

¹ Accounts for what has been implemented to date, further reductions that rely on future actions are included and accounted for in Chapter 3.

Energy Measures

During the last five years, residents and businesses of Grover Beach installed 83 kilowatts (kW) of solar photovoltaic systems and hot water heaters, which result in a reduction of 21 MT CO₂e in 2020. Energy efficient weatherization of 13 low-income homes in 2009 through the Home Repair Loan Program reduced emissions an additional 12 MT CO₂e.

The City completed a number of energy efficiency upgrades at City-owned or -operated facilities and buildings, replacing heating and air conditioning (HVAC) systems, upgrading lighting fixtures and building controls at seven city-owned buildings, installing 30 occupancy sensors, and replacing doors and windows. HVAC systems also receive semi-annual maintenance tune-ups. These projects resulted in an estimated electricity savings of 168,220 kWh and 1,695 therms of natural gas annually, reducing GHG emissions by 129 MT CO₂e. The City has also replaced 250 traffic signal lights, which is expected to reduce emissions by 40 MT CO₂e.

Transportation and Land Use Measures

Grover Beach has implemented a number of land use and transportation improvements, such as installing bicycle and pedestrian infrastructure, improvements along West Grand Avenue, improving safe routes to school, and developing the South County Transit Hub. In addition, the City has one electric pick-up truck and an electric charging station at City Hall. These measures are expected to reduce GHG emissions by approximately 111 MT CO₂e in 2020.

Solid Waste Measures

As of 2010, the California Green Building Code requires all local jurisdictions to ensure that 50 percent of all non-hazardous construction and demolition solid waste is diverted from landfills. Within Grover Beach, this would reduce emissions by an estimated 157 MT CO₂e in 2020.

Water Measures

The City has implemented a number of programs to reduce per capita water consumption by 20 percent, pursuant to SB X7-7. These programs identified in their Urban Water Master Plan are expected to reduce GHG emissions by approximately 23 MT CO₂e in 2020.

Urban Greening

Between 2006 and 2011, the City of Grover Beach planted 30 trees, which are estimated to sequester approximately one MT CO₂e in 2020.

ADJUSTED FORECAST

As shown in **Table 2-6**, State and local measures will reduce GHG emissions in Grover Beach by an estimated 11,135 MT CO₂e in 2020. Under the adjusted scenario GHG emissions are projected to decrease to 46,659 MT CO₂e (approximately 19 percent below the business-as-usual scenario of 57,794 MT CO₂e).

Table 2-6: Summary of Reductions from State and Local Measures and 2020 GHG Emissions

	GHG Emissions (MT CO ₂ e)
2020 Business-as-Usual Forecast	57,794
2020 Reduction from State Measures	-10,641
2020 Reduction from Local Measures	-494
Total Reduction from State and Local Measures	-11,135
2020 Adjusted Forecast	46,659

2.3 GHG Emissions Reduction Target

The City is committed to reducing its share of GHG emissions consistent with AB 32. The AB 32 Scoping Plan calls on local governments to establish a reduction target that “parallels the State’s commitment to reduce GHG emissions by approximately 15 percent from current levels by 2020.” Therefore, this CAP establishes a reduction target of 15 percent below 2005 levels by 2020. The 2005 baseline GHG emissions inventory and 2020 GHG emissions forecast under the adjusted scenario provide the necessary background for the City to identify the reduction in emissions needed from local measures to meet this target.

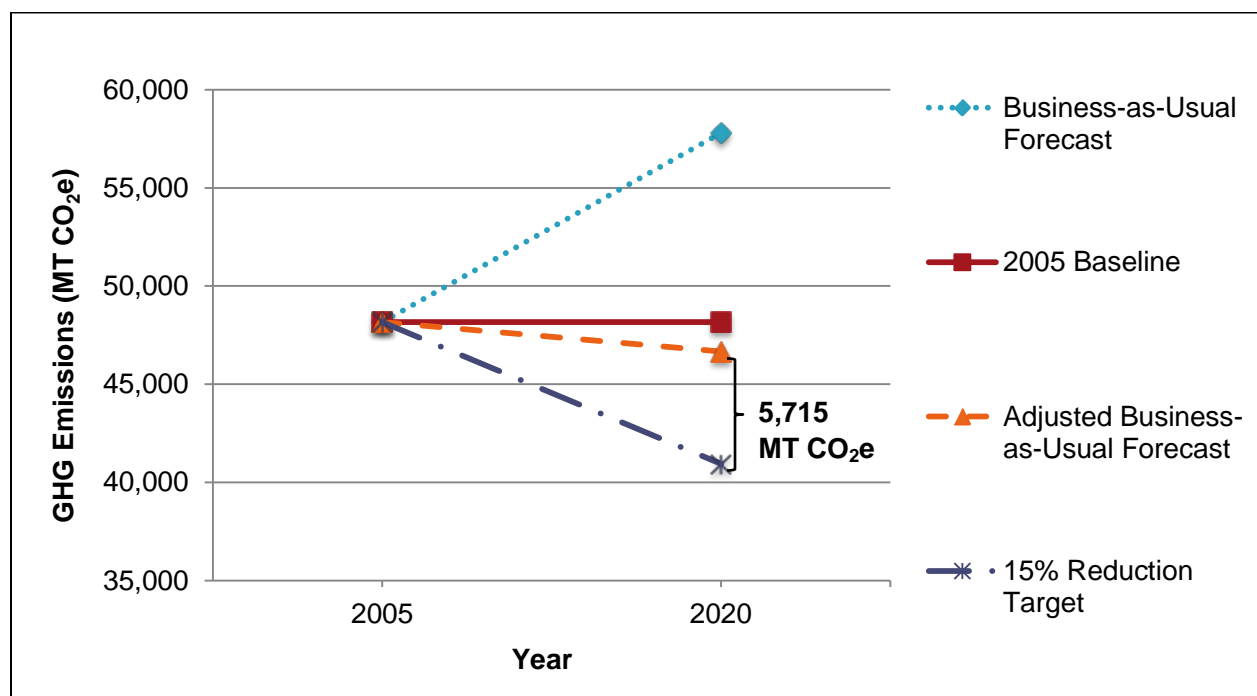
As shown in **Table 2-7** and **Figure 2-4**, based on the 15 percent reduction target, Grover Beach would need to reduce its community-wide emissions to 40,944 MT CO₂e by 2020. To meet this target, Grover Beach will need to reduce its GHG emissions 12 percent below the adjusted forecast levels³ (equivalent to 5,715 MT CO₂e) by 2020 through implementation of local measures and actions.

Table 2-7: Grover Beach’s GHG Emissions, Target, and Reduction Necessary to Meet Target

	GHG Emissions (MT CO ₂ e)
2005 Baseline Emissions	48,169
2020 Adjusted Forecast	46,659
Target (15 percent below 2005 levels by 2020)	40,944
Remaining Gap Necessary to Meet Target	5,715

³ As described in Section 2.3, the 2020 forecast accounts for approved, programmed, and/or adopted State- and local- level measures that will reduce local GHG emissions. Therefore, it is used to determine the necessary reductions to meet the City’s reduction target as it provides a more accurate picture of future emissions growth and the proportionate share of emissions the City must reduce once State measures to reduce GHG emissions have been implemented.

Figure 2-4: GHG Emissions in Relation to Target



CHAPTER 3

CLIMATE ACTION MEASURES

3.0 Climate Action Measures

This chapter identifies the measures that the City will implement to achieve its GHG emissions reduction target of 15 percent below 2005 levels by 2020. The City has identified a set of measures based on careful consideration of the reductions in GHGs needed to achieve the target, the sources and distribution of emissions identified in the GHG emissions inventory, existing priorities and resources, and the potential costs and benefits of each measure. Many of the CAP measures are also consistent with the measures of neighboring jurisdictions and regional agencies which is important for feasible and effective implementation of GHG reduction measures. Detailed analyses of the GHG reduction potential and estimated costs and savings for each measure are located in **Appendix B**.

3.1 Chapter Organization

The climate action measures, which represent ways to reduce GHG emissions, are organized into the following focus areas: City government operations, energy, transportation and land use, off-road, and solid waste. The discussion of each focus area begins with an introduction, followed by a summary table listing the measures within the focus area and the associated GHG reduction potential, where applicable. Following the introduction to each focus area, each measure is presented with the following information:

- **Existing or Completed Efforts:** a list of efforts the City has implemented or is in the process of implementing since the baseline year (2005) to accomplish the measure.
- **Implementation Actions:** the specific steps the City will take to achieve the GHG emission reduction and outcome of the measure.
- **GHG Reduction Potential:** the estimated reduction in GHG emissions anticipated in 2020.
- **Costs and Savings:** for each measure, potential costs and savings to the City or community (private) are categorized as none, very low, low, medium, and high. **Table 3-1** summarizes these category definitions. Costs account for the expense that would occur beyond conducting business-as-usual (i.e., without implementation of the CAP).

Table 3-1: Measure Cost and Savings

Aggregated City Government Costs/Savings	Per Unit Community Cost/Savings
Very Low: \$1 - \$10,000	Very Low: \$1 - \$500
Low: \$10,001 - \$50,000	Low: \$501 - \$1,000
Medium: \$50,001 - \$100,000	Medium: \$1,001 - \$5,000
High: \$100,001 or greater	High: \$5,001 or greater

Details related to measure implementation and monitoring, including responsible parties, performance criteria, implementation time frames, and potential funding sources are located in Chapter 5, *Implementation and Monitoring*.

3.2 City Government Operations Measure

The City has already taken a number of steps that have resulted in GHG emissions reductions, as identified in Chapter 2, *GHG Emissions and Reduction Target*, and is committed to building on those efforts. This focus area identifies measures and actions the City can implement to further reduce GHG emissions from City government operations and facilities. Although the GHG emissions that result from City government operations and facilities account for only three percent of Grover Beach’s community emissions, as an employer, property-owner, and regulatory entity, the City can set an example of GHG emissions reduction practices for the community and demonstrate additional benefits of the measures beyond reducing GHG emissions, such as cost savings in buildings and operations and improved operational efficiency. As shown in **Table 3-2**, the City government operations measure has the potential to reduce Grover Beach’s GHG emissions by 3 MT CO₂e by 2020.

In addition to reducing GHG emissions, the City government measure described in this section has the potential to provide other important benefits to the community. These benefits include:

- City leadership
- Reduced operating costs
- Improved public health
- Improved air quality
- Resource conservation

Table 3-2: City Government Operations GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO ₂ e)
C-1	Zero- and Low-Emission City Fleet Vehicles	3
City Government Operations Total		3

Measure C-1: Zero- and Low-Emission City Fleet Vehicles

Continue to replace official City vehicles and equipment with more efficient and/or alternatively fueled vehicles.

Implementation Actions:

- **C-1.1:** Work with the Central Coast Clean Cities Coalition to obtain funding to purchase low-emission and zero-emission fleet vehicles.
- **C-1.2:** Identify fleet vehicles near replacement and replace with lower emission vehicles.

**GHG Reduction
Potential:**

3 MT CO₂e

City Cost:

Very Low

City Savings:

Very Low

Private Cost:

None

Private Savings:

None

3.3 Community-wide Measures

3.3.1 ENERGY MEASURES

Energy use accounted for 46 percent of Grover Beach’s total GHG emissions in 2005. These emissions result from the combustion of fossil fuel, primarily coal, oil, and natural gas, which is used to heat, cool, and provide power to residential, commercial, and industrial buildings and other facilities. Factors affecting energy-related emissions in buildings include building design and the efficiency of technology and electronics in buildings. GHG emissions reductions can be achieved both by changes to the energy demand (e.g., improving energy efficiency and reducing consumption) and energy supply (e.g., switching from a high-carbon to a low- or zero-carbon technology or fuel). The energy measures listed in **Table 3-3** focus on these strategies and have the potential to reduce Grover Beach’s GHG emissions by 716 MT CO₂e by 2020.

In addition to reducing GHG emissions, the energy measures described in this section have the potential to provide other important benefits to the community, including:

- Reduced energy and operating costs
- Lower maintenance costs and extended equipment lives
- Increased building re-sale value
- Strengthened local economy
- Resource conservation
- Increased electricity reliability
- Improved air quality

Table 3-3: Energy GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO ₂ e)
E-1	Energy Efficiency Outreach and Incentive Programs	134
E-2	Energy Audit and Retrofit Program	248
E-3	Income-Qualified Energy Efficient Weatherization Programs	63
E-4	Small-Scale On-Site Solar Photovoltaic (PV) Incentive Program	234
E-5	Income-Qualified Solar PV Program	37
Energy Total		716

Measure E-1: Energy Efficiency Outreach and Incentive Programs

Expand participation in and the promotion of existing programs, such as Energy Upgrade California and San Luis Obispo County Energy Watch, to increase community awareness of existing energy efficiency rebates and financial incentives, and no- and low-cost actions community members can take to increase energy efficiency.

Implementation Actions:

- **E-1.1:** Conduct additional outreach and promotional activities, either individually or in collaboration with San Luis Obispo County Energy Watch, targeting specific groups or sectors within the community (e.g., homeowners, renters, businesses, etc.).
- **E-1.2:** Designate one week per year to conduct an energy efficiency outreach campaign targeting a specific group. The campaign week can also be used to recognize and encourage programs and educational outreach conducted by industry organizations, non-governmental entities, government agencies, and other community groups.
- **E-1.3:** Direct community members to existing program websites, such as Energy Upgrade California and San Luis Obispo County Energy Watch.

GHG Reduction Potential:

134 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

Varies

Private Savings:

Very Low

Measure E-2: Energy Audit and Retrofit Program

Facilitate voluntary energy assessments, retrofits, and retrocommissioning of residential and commercial buildings within Grover Beach.

Existing and/or Completed Efforts in Support of Measure:

- The City currently participates in the AB 811 CaliforniaFIRST energy efficiency and renewable energy financing program for multi-family residential and commercial buildings.

Implementation Actions:

- **E-2.1:** Develop and promote a residential and commercial energy audit program, either individually or in collaboration with San Luis Obispo County Energy Watch, local utilities, and/or neighboring jurisdictions.
- **E-2.2:** Conduct outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24 [1980]) in order to promote the audit and retrofit program.

GHG Reduction Potential:

248 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None to Medium

Private Savings:

Very Low to Medium

3.0 CLIMATE ACTION MEASURES

- **E-2.3:** As part of the business licensing and renewal process, encourage businesses to participate in the program and receive an energy audit.
- **E-2.4:** Participate in and promote a single-family residential energy efficiency financing program to encourage investment in energy efficiency upgrades.
- **E-2.5:** Continue to participate in and promote the AB 811 CaliforniaFIRST energy efficiency financing program for multi-family residential and commercial buildings.
- **E-2.6:** Work with Energy Upgrade California, local utilities, and/or community businesses and organizations, to annually conduct a "do-it-yourself" workshop for building energy retrofits.
- **E-2.7:** Highlight the effectiveness of energy audits and retrofits by showcasing the success of retrofit projects (e.g., on the City's website or in its newsletter).

Measure E-3: Income-Qualified Energy Efficient Weatherization Programs

Facilitate energy efficient weatherization of low- and middle-income housing through promotion of existing programs.

Implementation Actions:

- **E-3.1:** Continue to facilitate and promote existing income-qualified weatherization programs, such as PG&E's Middle Income Direct Install program, either individually or by partnering with a local organization.

GHG Reduction Potential:

63 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Low

Measure E-4: Small-Scale On-Site Solar PV Incentive Program

Facilitate the voluntary installation of small-scale on-site solar PV systems and solar hot water heaters in the community through expanded promotion of existing financial incentives, rebates, and financing programs, and by helping residents and business owners overcome common regulatory barriers and upfront capital costs.

Existing and/or Completed Efforts in Support of Measure:

- The City currently participates in the AB 811 CaliforniaFIRST energy efficiency and renewable energy financing program for multi-family residential and commercial buildings.

GHG Reduction Potential:

234 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

High

Private Savings:

Low to High

- The City has improved the permit review and approval process for small-scale solar PV systems by implementing recommendations for streamlined permitting.

Implementation Actions:

- **E-4.1:** Conduct a comprehensive review of the City's solar permitting process based on the Governor's Office of Planning and Research's (OPR) *California Solar Permitting Guidebook* (June 2012), identifying any existing barriers to facility implementation.
- **E-4.2:** Participate in and promote a single-family residential renewable energy financing program to encourage investment in small-scale on-site solar PV systems.
- **E-4.3:** Continue to participate in and promote the AB 811 CaliforniaFIRST renewable energy financing program for multi-family residential and commercial buildings.
- **E-4.4:** Expand education on and promotion of existing incentive, rebate, and financing programs for small-scale on-site solar PV systems and solar hot water heaters targeting specific groups or sectors within the community.
- **E-4.5:** Designate one week per year to conduct a renewable energy outreach campaign targeting a specific group. The campaign week can also be used to recognize community members that have implemented noteworthy or unique renewable energy projects.

Measure E-5: Income-Qualified Solar PV Program

Facilitate the installation of small-scale on-site solar PV systems on and solar hot water heaters in income-qualified housing units by promoting existing programs offered through the California Solar Initiative and New Solar Homes Partnership and by collaborating with organizations, such as GRID Alternatives, on outreach and eligibility.

Implementation Actions:

- **E-5.1:** Collaborate with GRID Alternatives and/or other community organizations to provide targeted education and outreach to developers and homeowners about incentives offered through the Single Family Affordable Solar Homes (SASH) Program¹ and the Multifamily Affordable Solar Homes (MASH) Program.
- **E-5.2:** Provide targeted outreach regarding solar water heating incentives offered through the California Solar Initiative, including the SASH and MASH Programs.

GHG Reduction

Potential:

37 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Low

¹ The California Solar Initiative's SASH Program provides fully subsidized systems to very low-income households, and highly subsidized systems to other low-income households. GRID Alternatives, a non-profit solar organization, manages the \$108 million SASH Program on the California Public Utility Commission's behalf.

3.0 CLIMATE ACTION MEASURES

3.3.2 TRANSPORTATION AND LAND USE MEASURES

Transportation-related emissions make up the 39 percent of Grover Beach's GHG emissions inventory. Factors affecting GHG emissions from transportation include the number of VMT, fuel economy, and the type of fuel used. The number of VMT is directly influenced by the geographic distribution of people and places, especially the density of development and zoning. Therefore, land use measures are included as reduction policies in this section. The transportation and land use measures listed in **Table 3-4** focus on these strategies and have the potential to reduce Grover Beach's GHG emissions by 2,554 MT CO₂e by 2020.

The transportation and land use measures in this section will not only help reduce GHG emissions, but also provide multiple other benefits to the community. These include:

- Reduced transportation costs
- Reduced traffic congestion
- Improved public health
- Strengthened local economy
- Improved infrastructure
- Increased equity
- Increased housing and travel options
- Resource conservation
- Reduced noise, air, and water pollution

Table 3-4: Transportation and Land Use GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO ₂ e)
TL-1	Bicycle Network	211
TL-2	Pedestrian Network	99
TL-3	Expand Transit Network	17
TL-4	Increase Transit Service Frequency/Speed	10
TL-5	Transportation Demand Management Incentives	7
TL-6	Parking Supply Management	56
TL-7	Electric Vehicle Network and Alternative Fueling Stations	364
TL-8	Smart Growth	1,790
Transportation and Land Use Total		2,554

Measure TL-1: Bicycle Network

Continue to improve and expand the city's bicycle network and infrastructure.

Existing and/or Completed Efforts in Support of Measure:

- The City currently requires new subdivisions and large developments to incorporate bicycle lanes, routes, and/or shared-use paths into street systems to provide a continuous network of routes, facilitated with markings, signage, and bicycle parking.
- In 2010, the City adopted a Bicycle Master Plan.

Implementation Actions:

- **TL-1.1:** Continue to pursue public and private funding to expand and link the city's bicycle network in accordance with the General Plan and Bicycle Plan.
- **TL-1.2:** Annually identify and schedule street improvement and maintenance projects to preserve and enhance the bicycle network.
- **TL-1.3:** Incorporate bicycle facility improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.
- **TL-1.4:** Continue to coordinate with and support SLOCOG in the implementation of bicycle plans to facilitate non-auto travel within and between communities.
- **TL-1.5:** Continue to collaborate with the San Luis Obispo Bicycle Coalition to assist with event promotions and publications to increase awareness and ridership during Bike Month.
- **TL-1.6:** Continue to enforce mandatory California Green Building Standards Code bicycle parking standards for non-residential development.

GHG Reduction Potential:

211 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Very Low

Measure TL-2: Pedestrian Network

Continue to improve and expand the City's pedestrian network.

Existing and/or Completed Efforts in Support of Measure:

- The City requires new development projects to create walkable neighborhoods and provide a pedestrian access network that internally links all uses and connects all existing or planned external streets. The City also requires new development to minimize barriers to pedestrian access and interconnectivity.

GHG Reduction Potential:

99 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Varies

3.0 CLIMATE ACTION MEASURES

- The City requires new development to implement traffic calming improvements (e.g., narrowing lanes, creating bikeways on designated routes, landscaped parkways, traffic circles, textured crosswalks, etc.) as appropriate through conditions of approval. The City also incorporates traffic calming improvements in the Capital Improvement Program.

Implementation Actions:

- **TL-2.1:** Continue to pursue public and private funding to expand and link the City's pedestrian network.
- **TL-2.2:** Annually identify and schedule sidewalk improvement and maintenance projects to preserve and enhance the pedestrian circulation network.
- **TL-2.3:** Incorporate pedestrian facilities improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.
- **TL-2.4:** Continue to expand and promote the Safe Routes to School program.

Measure TL-3: Expand Transit Network

Work with the Regional Transit Authority (RTA) and transit service providers to expand the local transit network (i.e., additional routes or stops, and/or expanded hours of operation) and its accessibility within the City.

Existing and/or Completed Efforts in Support of Measure:

- Through the development review process, the City requires new development to incorporate transit facilities and promote the use of public transit, where appropriate.

Implementation Actions:

- **TL-3.1:** Work with RTA and transit service providers to implement the Short Range Transit Plan.
- **TL-3.2:** Work with RTA and transit service providers to identify and map existing and future bus lines (routes) and transit corridors.
- **TL-3.3:** Continue to support the addition of transit routes that provide intercity express services.
- **TL-3.4:** Through the development review process, require new development to provide safe and convenient access to alternative and public transportation within the project area as feasible.

GHG Reduction Potential:

17 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

Very Low

Private Savings:

Medium

Measure TL-4: Increase Transit Service Frequency/Speed

Work with the RTA and transit services providers to increase transit service frequency (i.e., reducing headways) by identifying routes where increased bus frequency would improve service.

Implementation Actions:

- **TL-4.1:** Work with RTA and transit service providers to implement the Short Range Transit Plan.
- **TL-4.2:** Work with RTA and transit service providers to shorten regional service headways (e.g., by purchasing additional buses, re-routing existing buses, etc.) to 30 minutes or shorter at commute peaks subject to passenger load demand.
- **TL-4.3:** Support streamlined transit services and infrastructure that create a bus rapid transit network on main commute corridors.

GHG Reduction Potential:

10 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

Very Low

Private Savings:

Medium

Measure TL-5: TDM Incentives

Work with San Luis Obispo Regional Ride Share and Ride-On to conduct additional outreach and marketing of existing TDM programs and incentives to discourage single-occupancy vehicle trips and encourage alternative modes of transportation, such as carpooling, taking transit, walking, and biking.

Existing and/or Completed Efforts in Support of Measure:

- The City currently collaborates with San Luis Obispo Ride Share and the San Luis Obispo Bicycle Coalition.

Implementation Actions:

- **TL-5.1:** Collaborate with San Luis Obispo Ride Share and Ride-On to conduct additional outreach through event promotions and publications, targeting specific groups or sectors within the community (e.g., employers, employees, students, seniors, etc.).
- **TL-5.2:** Provide information on and promote existing employer based TDM programs as part of the business licensing and renewal process.
- **TL-5.3:** Continue to collaborate with San Luis Obispo Ride Share and the San Luis Obispo Bicycle Coalition to assist with event promotions and publications to increase awareness and ridership during Bike Month and Rideshare month.
- **TL-5.4:** Direct community members to existing program websites (e.g., Ride Share, Ride-On) by providing links on the City's website.

GHG Reduction Potential:

7 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Very Low

Measure TL-6: Parking Supply Management

Reduce parking requirements in areas such as the downtown where a variety of uses and services are planned in close proximity to each other and to transit.

Existing and/or Completed Efforts in Support of Measure:

- The City's Development Code allows for parking reductions in accordance with the APCD's Clean Air Plan. It also includes provisions for shared parking.

Implementation Actions:

- **TL-6.1:** Continue to encourage parking reductions in accordance with the Development Code.
- **TL-6.2:** Consider adoption of an in-lieu parking fee.

GHG Reduction Potential:

56 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Medium

Measure TL-7: Electric Vehicle Network and Alternative Fueling Stations

Continue to work with the APCD, Central Coast Clean Cities Coalition, and neighboring jurisdictions to create and implement the electric vehicle readiness plan.

Existing and/or Completed Efforts in Support of Measure:

- The City provides streamlined installation and permitting for electric vehicle charging stations.

Implementation Actions:

- **TL-7.1:** Continue to work with the APCD, Central Coast Clean Cities Coalition, and neighboring jurisdictions to create and implement the electric vehicle readiness plan through expanding the use of alternative fuel vehicles and fueling stations in the community (e.g., through identifying locations for fueling stations, offering incentives for alternative fuel vehicles, etc.).
- **TL-7.2:** Promote existing financial incentives for low- and zero-emissions vehicles, either individually or in collaboration with the Central Coast Clean Cities Coalition.
- **TL-7.3:** Continue to pursue funding for plug-in electric vehicle charging stations.
- **TL-7.4:** Amend Development Code to require large commercial/industrial projects to provide plug-in electric vehicle charging stations.

GHG Reduction Potential:

364 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

None

Measure TL-8: Smart Growth

Facilitate mixed-use, higher density, and infill development near transit stops, in existing community centers/downtown, and in other designated areas.

Existing and/or Completed Efforts in Support of Measure:

- In 2010, the City updated its General Plan Land Use Element, which reflects smart growth principles and promotes a land use pattern that enhances community connections. These smart growth principles include:
 - Providing for a mixture of compatible land uses on a single site
 - Creating a range of housing opportunities and choices
 - Creating walkable neighborhoods
 - Fostering distinctive, attractive communities with a strong sense of place
 - Community design element
 - Strengthen and directing development toward existing areas (infill)
 - Providing a variety of transportation choices
 - Integrate land use and transit

GHG Reduction

Potential:

1,790 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

Varies

Private Savings:

High

Implementation Actions:

- **TL-8.1:** Continue to provide and promote incentives (e.g., parking reductions, etc.) for mixed-use and medium- and high-density land use categories located within ¼-mile of a transit stop.
- **TL-8.2:** Continue to implement the goals and policies of the Land Use Element related to smart growth, which include promoting live/work and mixed use developments.

3.3.3 OFF-ROAD MEASURES

Emissions in the off-road sector result from the combustion of fuel, primarily diesel, gasoline, and compressed natural gas, which is used to power off-road equipment and vehicles. Off-road equipment and vehicles include those used in construction, agriculture, commercial, industrial, and landscaping operations as well as recreational vehicles. Factors affecting off-road emissions include the age, type, and usage of the vehicle or equipment.

GHG emissions reductions can be achieved by reducing off-road equipment and vehicle usage and idling or by using equipment that runs on electricity or alternative fuels. The off-road equipment measures listed in **Table 3-5** focus on these strategies and have the potential to reduce Grover Beach's GHG emissions by 1,804 MT CO₂e by 2020.

The off-road measures in this section will not only help reduce GHG emissions, but will also provide multiple other benefits to the community. These include:

- Improved air and water quality
- Reduced noise pollution
- Improved public health

Table 3-5: Off-Road GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO ₂ e)
O-1	Construction Vehicle and Equipment Idling Limits	1,755
O-2	Off-Road Vehicle and Equipment Incentives	49
Off-Road Total		1,804

Measure O-1: Construction Vehicle and Equipment Idling Limits

Reduce GHG emissions from construction vehicles and equipment by limiting idling.

Implementation Actions:

- **O-1.1:** Through the construction permitting process, limit construction vehicle and equipment idling to 3 minutes and require the project applicant to post clear signs for workers at the entrances to the site.

GHG Reduction Potential:

1,755 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

Varies

Private Savings:

Varies

Measure O-2: Off-Road Vehicle and Equipment Incentives

Continue to work with the APCD and promote existing programs that fund vehicle and equipment upgrades, retrofits, and replacement through the Carl Moyer heavy-duty vehicle and equipment program or other funding mechanisms.

Implementation Actions:

- **O-2.1:** Conduct additional outreach and promotional activities targeting specific groups (e.g., agricultural operations, construction companies, etc.).
- **O-2.2:** Provide links on the City's website to existing program websites (e.g., APCD, Carl Moyer Grant page).

GHG Reduction Potential:

49 MT CO₂e

City Cost:

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

Varies

3.0 CLIMATE ACTION MEASURES

3.3.4 SOLID WASTE MEASURES

As solid waste decomposes in landfills, it releases methane, a GHG 21 times more potent than carbon dioxide (USEPA, 2012). In 2005, the Grover Beach community sent approximately 9,042 tons of waste to landfill.

Waste management is an important action that the community can take to reduce GHG emissions. Waste management can be achieved by reducing the amount of trash and other waste that is discarded; reusing containers, products, and building materials; and recycling as many materials as possible, including green waste and construction materials. The solid waste measure listed in **Table 3-6** has the potential to reduce Grover Beach's GHG emissions by 638 MT CO₂e by 2020.

In addition to reducing GHG emissions, the solid waste measure described in this section has the potential to provide other important benefits to the community. These include:

- Improved air quality
- Resource conservation

Table 3-6: Solid Waste GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reductions (MT CO ₂ e)
S-1	Solid Waste Diversion	638
Solid Waste Total		638

Measure S-1: Solid Waste Diversion

Adopt a specified solid waste diversion rate that exceeds the state-mandated rate of 50 percent and identify programs to meet the identified rate by 2020.

Implementation Actions:

- **S-1.1:** Adopt a solid waste diversion rate goal of 75 percent (25 percent above the state-mandated rate of 50 percent consistent with California's AB 341).
- **S-1.2:** Identify the current city-wide diversion rate, and work with the Integrated Waste Management Authority to increase recycling, waste diversion, and education and outreach to meet the City's goal.

GHG Reduction Potential:638 MT CO₂e**City Cost:**

Very Low

City Savings:

None

Private Cost:

None

Private Savings:

None

3.4 GHG Reduction Summary

As discussed in Chapter 2, *GHG Emissions and Reduction Target*, Grover Beach will need to reduce its GHG emissions by 5,715 MT CO₂e by 2020 to meet its 15 percent reduction target. The GHG reduction measures in this CAP are estimated to reduce Grover Beach's GHG emissions by 5,715 MT CO₂e by 2020, as summarized in **Table 3-7**. Therefore, the implementation of the measures identified in this chapter would enable Grover Beach to meet its target.

Table 3-7: Summary of GHG Reductions by Measure

Measure Number	Measure	2020 GHG Reduction (MT CO ₂ e)
City Government Operations		
C-1	Zero- and Low-Emission City Fleet Vehicles	3
<i>City Government Operations Subtotal</i>		3
Energy		
E-1	Energy Efficiency Outreach and Incentive Programs	134
E-2	Energy Audit and Retrofit Program	248
E-3	Income-Qualified Energy Efficient Weatherization Programs	63
E-4	Small-Scale Solar PV Incentive Program	234
E-5	Income-Qualified Solar PV Program	37
<i>Energy Subtotal</i>		716
Transportation and Land Use		
TL-1	Bicycle Network	211
TL-2	Pedestrian Network	99
TL-3	Expand Transit Network	17
TL-4	Increase Transit Service Frequency/Speed	10
TL-5	Transportation Demand Management Incentives	7
TL-6	Parking Supply Management	56
TL-7	Electric Vehicle Network and Alternative Fueling Stations	364
TL-8	Smart Growth	1,790
<i>Transportation and Land Use Subtotal</i>		2,554
Off-Road		
O-1	Construction Vehicle and Equipment Idling Limits	1,755
O-2	Off-Road Vehicle and Equipment Incentives	49
<i>Off-Road Subtotal</i>		1,804
Solid Waste		
S-1	Solid Waste Diversion	638
<i>Solid Waste Subtotal</i>		638
TOTAL REDUCTION		5,715

CHAPTER 4

ADAPTATION

4.0 Adaptation

There are two responses to climate change available to local governments: mitigation and adaptation. The previous chapter addressed climate change mitigation, by identifying measures to reduce GHG emissions. This chapter identifies measures to prepare for and minimize the risks associated with anticipated climate change impacts and increase resiliency to those changes. Drawing on a recent climate adaptation planning process that took place in San Luis Obispo County, this chapter identifies climate change predictions for the region and specific to Grover Beach. This chapter also provides an assessment of populations and infrastructure within Grover Beach that are particularly vulnerable to the identified impacts and identifies measures to increase community resilience to those effects.

“Adaptation planning at the local, state, and national levels can limit the damage caused by climate change, as well as reduce the long-term costs of responding to the climate related impacts that are expected to grow in number and intensity in the decades to come” (PEW Center on Global Climate Change, 2011).

4.1 Climate Change Predictions and Vulnerability

Climate change is a global phenomenon that has the potential to impact local health, agriculture, natural resources, infrastructure, emergency response, tourism, and many other facets of society. As climate change continues to progress, increased stress to vulnerable populations and sectors of society are expected. In 2010, key stakeholders, elected officials, city and county planners, land managers, public health officials, concerned citizens, scientists, and the Local Government Commission initiated a process to address climate change adaptation in San Luis Obispo County. As part of this process, scientists from Geos Institute identified anticipated climate change impacts in the region and threats to socioeconomic and natural systems. The range of potential impacts presented in the document *ClimateWise: Integrated Climate Change Adaptation Planning in San Luis Obispo County in November 2010* (ClimateWise) are based on projections of climate change in the San Luis Obispo region using three of the best-available models (MIROC, HadCM, and CSIRO) and an emissions scenario drawn from those used by the Intergovernmental Panel on Climate Change (IPCC).

According to ClimateWise, climate change could lead to the following potential changes in the San Luis Obispo County region and the City of Grover Beach:

- Increased temperatures
- Seal level rise
- Storm surges
- Erosion
- Changed precipitation

Based on these climate changes, a vulnerability assessment was completed to determine the degree to which physical, socioeconomic, and natural factors are susceptible to, or unable to

4.0 ADAPTATION

accommodate, the anticipated effects of climate change. The assessment was comprised of three primary components:

- Exposure – the nature and degree to which a system experiences a stress or hazard
- Sensitivity – the degree to which the system is impacted by a given stressor, change or disturbance
- Adaptive Capacity – the ability to cope with extreme events, to make adaptive changes, or to transform to a greater extent, including the ability to moderate potential damages and to take advantage of opportunities

Each of these components contributes to understanding the overall vulnerability of a functional system (Snoover, 2007). Climate change will most impact those individuals and systems that have both the greatest exposure and sensitivity to climate change impacts, in addition to the lowest adaptive capacity (see **Table 4-1**). For each climatic hazard, the population and economic sector most vulnerable depends on the unique combination of these three factors (ClimateWise, 2010).

Table 4-1: Climate Change Vulnerability

Components of Vulnerability	Climatic Risks	Populations or Infrastructure Particularly at Risk
Exposure	Floods Heat Drought Sea-level rise	Floodplain residents Outdoor workers Farmers, all water users Coastal residents, structures and facilities
Sensitivity	Heat Air pollution Drought	Infants, elderly Asthma sufferers, children Farmers
Adaptive Capacity	Floods Heat Sea-level rise	Institutionalized populations, low-income households Low-income residents Coastal residents, structures and facilities

Source: ClimateWise, 2010

4.1.1 INCREASED TEMPERATURES

Average temperatures in San Luis Obispo County are expected to become 2 to 4 degrees warmer by mid-century and possibly 4 to 8 degrees warmer by late century, depending on emission levels (ClimateWise, 2010). Greater warming is expected to occur in the summer months compared to winter.

Public health may be negatively impacted by a changing climate as a result of changing environmental conditions (e.g., extreme weather events, changes in temperature and rainfall that decrease water supply, worsening air quality, and increases in allergens and air pollutants). This vulnerability assessment is consistent with California's Adaptation Strategy in the

identification of population segments that will be the most at risk from climate change impacts.¹ In addition, California's Adaptation Strategy also identifies "individuals suffering from chronic heart or lung disease, persons with mental disabilities, the socially and/or economically disadvantaged as being vulnerable populations" (California Natural Resources Agency, 2009). In addition, increased temperatures are expected to accelerate sea level rise from both warming of the ocean (warmer water takes up more space than colder water) and melting of ice caps and glaciers (Karl, 2009).

4.1.2 SEA LEVEL RISE

Sea level changes affect storm related and long-term coastal erosion and retreat, flooding and inundation, and tsunami potential. Sea levels change over time based on changing volumes of seawater and sea basins. Higher temperatures correlate with greater water volumes due to expansion of warmer seawaters and increased melting of icecaps and glaciers.

Using the best available science, statewide studies conducted in 2009 projected that sea level could rise 12 to 16 inches above current levels by 2050 (Cal-Adapt 2010). This is double the increase California's coastline has experienced over the entire past century. By the end of the century, sea levels are projected to rise 3.3 to 4.6 feet (23 to 55 inches) above current levels. Sea level rise is expected to result in higher storm surges and flood elevations, inundating transportation, commercial, and residential infrastructure in low-lying areas, as well as beach and dune erosion and permanent flooding of coastal wetlands.

As with many coastal cities, sea level rise may be the most significant threat due to climate change for the City of Grover Beach. While the downtown area lies above any predicted sea level rise, significant areas along the length of Pismo State Beach will be highly vulnerable to coastal flooding, erosion, and salt-water infiltration. Most at risk will be State Highway 1, beach and dune areas, and the San Luis Obispo Sanitation District Wastewater Plant (located in Oceano, but treats the City's wastewater).

4.1.3 STORM SURGES

Sea level rise combined with the tidal effect of larger and more intense oceanic storms is expected to create higher periodic storm surges. These extreme 'high tides' can cause impacts over and above those predicted to occur as a result of sea level rise mentioned above. Impacts from storm surges may include the following: flooding of low-lying coastal areas, beach and dune erosion, and inundation of infrastructure and wetlands.

Businesses, residents, and infrastructure located within low-lying coastal areas would be more susceptible to damage or disruption by larger than average storm events. Currently, there is insufficient infrastructure to accommodate a momentary surplus of water, and large areas of

¹ California's Adaptation Strategy was developed in 2009 by the California Natural Resources Agency (CNRA), working through the Climate Action Team. Seven sector-specific working groups led by 12 state agencies, boards and commissions, and numerous stakeholders were convened for this effort. The strategy proposes a comprehensive set of recommendations designed to inform and guide California decision makers as they begin to develop policies that will protect the state, its residents and its resources from a range of climate change impacts.

impervious pavement prevent much of the water from infiltrating into the ground. This is most critical in the areas around the ocean outlets of the local creeks.

4.1.4 EROSION

Erosion is the movement of sediment away from the shore by means of wave or current action. Sea level rise facilitates this process by promoting offshore transport of sediment. Research suggests that shoreline recession can be as much as 50 to 200 times the rise in relative sea level (Bruun, 1962). Beaches and dunes, as well as facilities and infrastructure within their vicinity, may be impacted by erosion.

Beaches and dunes are subject to gradual wave-driven erosion, and naturally move landward over time. Projected sea level rise and larger storm events would accelerate the rate and extent of erosion and retreat as higher water levels create greater wave energy reaching the shoreline. Beach erosion will be greatest along Pismo State Beach and may have an impact on the barrier dunes located inland from the beach (i.e., Grover Beach).

4.1.5 CHANGED PRECIPITATION

Precipitation, except during winter months, is anticipated to change little in the near future. However, climate models forecast drier conditions throughout San Luis Obispo County by 2075. As a result, droughts may become more frequent, longer and more severe. It is also projected that when rainfall does occur, it may be more likely to come in the form of intense downpours.

Grover Beach relies on water from the Lopez Lake Treatment Facility and from city wells. The Grover Beach Public Works Department supplies the water for urban use, and a limited number of private wells serve agricultural uses within the city limits. While climate models predict little change in rainfall patterns for the near future, they do forecast a drier climate during the last half of this century. This may result in longer and more severe periods of drought, therefore impacting agricultural uses, which rely on annual precipitation for reliable water for crops. Reduced water supplies will affect all water users in the city.

4.2 Adaptation Measures

The following measures focus on items the City of Grover Beach can implement in adapting to climate change. The goal of these measures is to reduce impacts to the community, the economy, and local natural resources. Recognizing the link between public health and climate adaptation, this chapter recommends adaptation measures that are designed to reduce the negative impacts of climate change on sensitive populations and communities. Measures were developed from those identified in the ClimateWise program, the World Bank Primer on Reducing Vulnerabilities to Disaster, International Council for Local Environmental Initiatives (ICLEI), and the California Natural Resources Agency's Climate Adaptation Strategy.

Measure A-1: Climate Change Vulnerability

Periodically reassess regional climate change vulnerabilities.

Implementation Actions:

- **A-1.1:** Participate in inter-agency and or inter-jurisdictional meeting and planning activities to periodically reassess regional climate change vulnerabilities.
- **A-1.2:** Incorporate newly identified adaptation measures into planning documents as appropriate.

Measure A-2: Public Health and Emergency Preparedness

Prepare for anticipated climate change effects on public health, the local economy, and populations that may bear a disproportionate burden of the climate change effects.

Implementation Actions:

- **A-2.1:** Collaborate with public safety providers to disseminate public preparedness and emergency response information related to climate change.
- **A-2.2:** Collaborate with public safety providers to distribute publicly available information on emergency exit routes and methods.

Measure A-3: Water Management

Implement new policies and programs to limit community exposure to threats such as flooding, and support those that encourage water use conservation and efficiency.

Implementation Actions:

- **A-3.1:** Collaborate with other jurisdictions to address water supply threats, flooding, and wastewater management.
- **A-3.2:** Continue to seek grants and other sources of funding, including the State Integrated Regional Water Management Grant Program and mitigation opportunities, to enhance flood control and improve water quality.

Measure A-4: Infrastructure

Work to improve the resilience of systems that provide the resources and services critical to community function.

Implementation Actions:

- **A-4.1:** Assess the potential impact of climate change as part of the update of plans that manage community infrastructure systems.
- **A-4.2:** Complete an assessment, including economic impacts and threats to public health and safety, for projected climate change impacts on local transportation, water, wastewater, stormwater, energy, and communication systems.

4.0 ADAPTATION

- **A-4.3:** Collaborate with the South San Luis Obispo County Sanitation District to develop mitigation plans for protection of the wastewater treatment facility and the relocation or elevation of vulnerable infrastructure.

CHAPTER 5

IMPLEMENTATION AND MONITORING

5.0 Implementation and Monitoring

Implementation and monitoring are essential components of the CAP to ensure that Grover Beach reduces its GHG emissions and meets its target. This chapter identifies key steps that the City will take to implement the CAP and monitor the progress in reducing Grover Beach's GHG emissions consistent with AB 32. It also describes potential funding sources and mechanisms available to implement the CAP.

5.1 Implementation Matrix

Ensuring that the CAP measures translate into measurable reductions in GHG emissions is critical to the success of the CAP. To facilitate this, each measure and its corresponding implementation actions identified in Chapter 3, *Climate Action Measures*, and Chapter 4, *Adaptation*, is listed in the implementation matrix in **Table 5-1** along with the following items:

- **Responsible Department(s):** The City department that will be primarily responsible for implementing, monitoring, and reporting on the progress of the selected measure and corresponding actions.
- **Implementation Time Frame:** The phase in which this measure should begin implementation. Please note that measures already underway with existing or recently completed efforts in support of the measure are categorized as near-term. Time frames include:
 - Near-Term – By 2015
 - Mid-Term – 2016-2017
 - Long-Term – 2018-2020
- **City Cost and Savings Estimates:** For each measure, potential costs and savings to the City are categorized as none (\$0), very low (\$1-\$10,000), low (\$10,001-\$50,000), medium (\$50,001-\$100,000), and high (\$100,001 or greater). Supporting information on costs and savings is provided in **Appendix B**.
- **GHG Reduction Potential:** The GHG reduction potential value identifies the estimated annual emission reductions anticipated in 2020, measured in MT CO₂e. Supporting information pertaining to the GHG reduction calculations is provided in **Appendix B**.
- **Performance Indicator:** Performance indicators enable the City to generally monitor measure progress.

Table 5-1: Implementation Matrix

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
City Government Operations							
C-1: Zero- and Low-Emission City Fleet Vehicles. Continue to replace official City vehicles and equipment with more efficient and/or alternatively fueled vehicles.	C-1.1: Work with the Central Coast Clean Cities Coalition to obtain funding to purchase low-emission and zero-emission fleet vehicles. C-1.2: Identify fleet vehicles near replacement and replace with lower emission vehicles.	Public Works	Very Low	Very Low	3	2 municipal vehicles replaced by 2020	Near-Term
Energy							
E-1: Energy Efficiency Outreach and Incentive Programs. Expand participation in and the promotion of existing programs, such as Energy Upgrade California and San Luis Obispo County Energy Watch, to increase community awareness of existing energy efficiency rebates and financial incentives, and no- and low-cost actions	E-1.1: Conduct additional outreach and promotional activities, either individually or in collaboration with San Luis Obispo County Energy Watch, targeting specific groups or sectors within the community (e.g., homeowners, renters, businesses, etc.). E-1.2: Designate one week per year to conduct an energy efficiency outreach campaign targeting a specific group. The campaign week can also be used to recognize and encourage programs and educational outreach conducted by industry organizations, non-governmental entities, government agencies, and	Community Development, Public Works	Very Low	None	134	35 percent of households participating with 5 percent energy savings and 40 percent of businesses participating with 6 percent energy savings by 2020	Near-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
community members can take to increase energy efficiency.	other community groups. E-1.3: Direct community members to existing program websites, such as Energy Upgrade California and San Luis Obispo County Energy Watch.						
E-2: Energy Audit and Retrofit Program. Facilitate voluntary energy assessments, retrofits, and retrocommissioning of residential and commercial buildings within Grover Beach.	<p>E-2.1: Develop and promote a residential and commercial energy audit program, either individually or in collaboration with San Luis Obispo County Energy Watch, local utilities, and/or neighboring jurisdictions.</p> <p>E-2.2: Conduct outreach and promotional activities targeting specific groups (e.g., owners of buildings built prior to Title 24 [1980]) in order to promote the audit and retrofit program.</p> <p>E-2.3: As part of the business licensing and renewal process, encourage businesses to participate in the program and receive an energy audit.</p> <p>E-2.4: Participate in and promote a single-family residential energy efficiency financing program to encourage investment in energy efficiency upgrades.</p> <p>E-2.5: Continue to participate in and promote the AB 811</p>	Community Development	Very Low	None	248	350 households and 50 businesses audited by 2020, with an average energy savings of 30 percent per retrofit	Mid-Term

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
	<p>CaliforniaFIRST energy efficiency financing program for multi-family residential and commercial buildings.</p> <p>E-2.6: Work with Energy Upgrade California, local utilities, and/or community businesses and organizations, to annually conduct a "do-it-yourself" workshop for building energy retrofits.</p> <p>E-2.7: Highlight the effectiveness of energy audits and retrofits by showcasing the success of retrofit projects (e.g., on the City's website or in its newsletter).</p>						
E-3: Income-Qualified Energy Efficient Weatherization Programs. Facilitate energy efficient weatherization of low- and middle-income housing through promotion of existing programs.	E-3.1: Continue to facilitate and promote existing income-qualified weatherization programs, such as PG&E's Middle Income Direct Install program, either individually or by partnering with a local organization.	Community Development	Very Low	None	63	50 residential units upgraded by 2020	Near-Term
E-4: Small-Scale On-Site Solar PV Incentive Program. Facilitate the voluntary installation	E-4.1: Conduct a comprehensive review of the City's solar permitting process based on the Governor's Office of Planning and Research's (OPR) California Solar Permitting	Community Development	Very Low	None	234	14 commercial solar PV systems installed, 50	Near-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
of small-scale on-site solar PV systems and solar hot water heaters in the community through expanded promotion of existing financial incentives, rebates, and financing programs, and by helping residents and business owners overcome common regulatory barriers and upfront capital costs.	<p>Guidebook (June 2012), identifying any existing barriers to facility implementation.</p> <p>E-4.2: Participate in and promote a single-family residential renewable energy financing program to encourage investment in small-scale on-site solar PV systems.</p> <p>E-4.3: Continue to participate in and promote the AB 811 CaliforniaFIRST renewable energy financing program for multi-family residential and commercial buildings.</p> <p>E-4.4: Expand education on and promotion of existing incentive, rebate, and financing programs for small-scale on-site solar PV systems and solar hot water heaters targeting specific groups or sectors within the community.</p> <p>E-4.5: Designate one week per year to conduct a renewable energy outreach campaign targeting a specific group. The campaign week can also be used to recognize community members that have implemented noteworthy or unique renewable energy projects.</p>					residential solar PV systems installed, and 80 residential solar water heater installed by 2020	

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
E-5: Income-Qualified Solar PV Program. Facilitate the installation of small-scale on-site solar PV systems on and solar hot water heaters in income-qualified housing units by promoting existing programs offered through the California Solar Initiative and New Solar Homes Partnership and by collaborating with organizations, such as GRID Alternatives, on outreach and eligibility.	<p>E-5.1: Collaborate with GRID Alternatives and/or other community organizations to provide targeted education and outreach to developers and homeowners about incentives offered through the Single Family Affordable Solar Homes (SASH) Program and the Multifamily Affordable Solar Homes (MASH) Program.</p> <p>E-5.2: Provide targeted outreach regarding solar water heating incentives offered through the California Solar Initiative, including the SASH and MASH Programs.</p>	Community Development	Very Low	None	37	20 low-income residential solar PV systems installed and 20 low-income residential solar water heaters installed by 2020	Near-Term
Transportation and Land Use							
TL-1: Bicycle Network. Continue to improve and expand the city's bicycle network and infrastructure.	<p>TL-1.1: Continue to pursue public and private funding to expand and link the city's bicycle network in accordance with the General Plan and Bicycle Plan.</p> <p>TL-1.2: Annually identify and schedule street improvement and maintenance projects to preserve and enhance the bicycle network.</p>	Public Works, Community Development	Very Low	None	211	10 miles of bike lane added by 2020	Near-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
	<p>TL-1.3: Incorporate bicycle facility improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.</p> <p>TL-1.4: Continue to coordinate with and support SLOCOG in the implementation of bicycle plans to facilitate non-auto travel within and between communities.</p> <p>TL-1.5: Continue to collaborate with the San Luis Obispo Bicycle Coalition to assist with event promotions and publications to increase awareness and ridership during Bike Month.</p> <p>TL-1.6: Continue to enforce mandatory California Green Building Standards Code bicycle parking standards for non-residential development.</p>						
TL-2: Pedestrian Network. Continue to improve and expand the City's pedestrian network.	<p>TL-2.1: Continue to pursue public and private funding to expand and link the City's pedestrian network.</p> <p>TL-2.2: Annually identify and schedule sidewalk improvement and maintenance projects to preserve and enhance the pedestrian circulation network.</p>	Public Works	Very Low	None	99	3 miles of sidewalk added by 2020	Near-Term

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
	<p>TL-2.3: Incorporate pedestrian facilities improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of work.</p> <p>TL-2.4: Continue to expand and promote the Safe Routes to School program.</p>						
<p>TL-3: Expand Transit Network. Work with the Regional Transit Authority (RTA) and transit service providers to expand the local transit network (i.e., additional routes or stops, and/or expanded hours of operation) and its accessibility within the City.</p>	<p>TL-3.1: Work with RTA and transit service providers to implement the Short Range Transit Plan.</p> <p>TL-3.2: Work with RTA and transit service providers to identify and map existing and future bus lines (routes) and transit corridors.</p> <p>TL-3.3: Continue to support the addition of transit routes that provide intercity express services.</p> <p>TL-3.4: Through the development review process, require new development to provide safe and convenient access to alternative and public transportation within the project area as feasible.</p>	Public Works	Very Low	None	17	10 percent increase in transit service by 2020	Near-Term
<p>TL-4: Increase Transit Service Frequency/Speed. Work with the RTA and transit</p>	<p>TL-4.1: Work with RTA and transit service providers to implement the Short Range Transit Plan.</p> <p>TL-4.2: Work with RTA and transit service providers to shorten</p>	Public Works	Very Low	None	10	10 percent reduction in headways (increase in frequency)	Near-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
services providers to increase transit service frequency (i.e., reducing headways) by identifying routes where increased bus frequency would improve service.	regional service headways (e.g., by purchasing additional buses, re-routing existing buses, etc.) to 30 minutes or shorter at commute peaks subject to passenger load demand. TL-4.3: Support streamlined transit services and infrastructure that create a bus rapid transit network on main commute corridors.					by 2020	
TL-5: Transportation Demand Management (TDM) Incentives. Work with San Luis Obispo Regional Ride Share and Ride-On to conduct additional outreach and marketing of existing TDM programs and incentives to discourage single-occupancy vehicle trips and encourage alternative modes of transportation, such as carpooling, taking transit, walking, and biking.	TL-5.1: Collaborate with San Luis Obispo Ride Share and Ride-On to conduct additional outreach through event promotions and publications, targeting specific groups or sectors within the community (e.g., employers, employees, students, seniors, etc.). TL-5.2: Provide information on and promote existing employer based TDM programs as part of the business licensing and renewal process. TL-5.3: Continue to collaborate with San Luis Obispo Ride Share and the San Luis Obispo Bicycle Coalition to assist with event promotions and publications to increase awareness and ridership during Bike Month and Rideshare	Community Development	Very Low	None	7	4 percent of employees participating in TDM programs	Near-Term

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
	month. TL-5.4: Direct community members to existing program websites (e.g., Ride Share, Ride-On) by providing links on the City's website.						
TL-6: Parking Supply Management. Reduce parking requirements in areas such as the downtown where a variety of uses and services are planned in close proximity to each other and to transit.	TL-6.1: Continue to encourage parking reductions in accordance with the Development Code. TL-6.2: Consider adoption of an in-lieu parking fee.	Community Development	Very Low	None	56	Net reduction of 25 parking spaces by 2020	Near-Term
TL-7: Electric Vehicle Network and Alternative Fueling Stations. Continue to work with the APCD, Central Coast Clean Cities Coalition, and neighboring jurisdictions to create and implement the electric vehicle readiness plan.	TL-7.1: Continue to work with the APCD, Central Coast Clean Cities Coalition, and neighboring jurisdictions to create and implement the electric vehicle readiness plan through expanding the use of alternative fuel vehicles and fueling stations in the community (e.g., through identifying locations for fueling stations, offering incentives for alternative fuel vehicles, etc.). TL-7.2: Promote existing financial	Community Development	Very Low	None	364	3 percent increase in electric vehicles by 2020	Near-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
	<p>incentives for low- and zero-emissions vehicles, either individually or in collaboration with the Central Coast Clean Cities Coalition.</p> <p>TL-7.3: Continue to pursue funding for plug-in electric vehicle charging stations.</p> <p>TL-7.4: Amend Development Code to require large commercial/industrial projects to provide plug-in electric vehicle charging stations.</p>						
<p>TL-8: Smart Growth. Facilitate mixed-use, higher density, and infill development near transit routes, in existing community centers/downtown, and in other designated areas.</p>	<p>TL-8.1: Continue to provide and promote incentives (e.g., parking reductions, etc.) for mixed-use and medium- and high-density land use categories located within ¼-mile of a transit stop.</p> <p>TL-8.2: Continue to implement the goals and policies of the Land Use Element related to smart growth, which include promoting live/work and mixed use developments.</p>	Community Development	Very Low	None	1,790	9 percent reduction in VMT by 2020	Near-Term
Off-Road							
<p>O-1: Construction Vehicle and Equipment Idling Limits. Reduce GHG emissions from</p>	<p>O-1.1: Through the construction permitting process, limit construction vehicle and equipment idling to 3 minutes and require the project applicant to post clear signs</p>	Community Development	Very Low	None	1,755	Limit idling time to 3 minutes or less	Long-Term

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
construction vehicles and equipment by limiting idling.	for workers at the entrances to the site.						
O-2: Off-Road Vehicle and Equipment Incentives. Continue to work with the APCD and promote existing programs that fund vehicle and equipment upgrades, retrofits, and replacement through the Carl Moyer heavy-duty vehicle and equipment program or other funding mechanisms.	O-2.1: Conduct additional outreach and promotional activities targeting specific groups (e.g., agricultural operations, construction companies, etc.). O-2.2: Provide links on the City's website to existing program websites (e.g., APCD, Carl Moyer Grant page).	Public Works, Community Development	Very Low	None	49	1 percent of off-road vehicles/ equipment replaced with electric-powered equipment and 1 percent replaced with alternative fuel vehicles/ equipment by 2020	Mid-Term
Solid Waste							
S-1: Solid Waste Diversion. Adopt a specified solid waste diversion rate that exceeds the state-mandated rate of 50 percent and identify programs to meet the identified rate by 2020.	S-1.1: Adopt a solid waste diversion rate goal of 75 percent (25 percent above the state-mandated rate of 50 percent consistent with California's AB 341). S-1.2: Identify the current city-wide diversion rate, and work with the Integrated Waste Management Authority to increase recycling, waste diversion, and education and outreach to meet the City's goal.	Public Works	Very Low	None	638	75 percent of solid waste diverted by 2020	Mid-Term

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
Adaptation							
A-1: Climate Change Vulnerability. Periodically reassess regional climate change vulnerabilities.	A-1.1: Participate in inter-agency and or inter-jurisdictional meeting and planning activities to periodically reassess regional climate change vulnerabilities. A-1.2: Incorporate newly identified adaptation measures into planning documents as appropriate.	Community Development	Very Low	None	NA	NA	Mid-Term
A-2: Public Health and Emergency Preparedness. Prepare for anticipated climate change effects on public health, the local economy, and populations that may bear a disproportionate burden of the climate change effects.	A-2.1: Collaborate with public safety providers to disseminate public preparedness and emergency response information related to climate change. A-2.2: Collaborate with public safety providers to distribute publicly available information on emergency exit routes and methods.	Community Development, Public Works	Very Low	None	NA	NA	Long-Term
A-3: Water Management. Implement new policies and programs to limit community exposure to threats such as flooding, and support those that encourage water use	A-3.1: Collaborate with other jurisdictions to address water supply threats, flooding, and wastewater management. A-3.2: Continue to seek grants and other sources of funding, including the State Integrated Regional Water Management Grant Program and mitigation opportunities, to enhance	Public Works	Very Low	None	NA	NA	Long-Term

5.0 IMPLEMENTATION AND MONITORING

Measure	Actions	Responsible Department	City Cost	City Savings	2020 GHG Reduction (MT CO ₂ e)	Performance Indicator	Implementation Time Frame
conservation and efficiency.	flood control and water quality.						
A-4: Infrastructure. Work to improve the resilience of systems that provide the resources and services critical to community function.	<p>A-4.1: Assess the potential impact of climate change as part of the update of plans that manage community infrastructure systems.</p> <p>A-4.2: Complete an assessment, including economic impacts and threats to public health and safety, for projected climate change impacts on local transportation, water, wastewater, stormwater, energy, and communication systems.</p> <p>A-4.3: Collaborate with the South San Luis Obispo County Sanitation District to develop mitigation plans for protection of the wastewater treatment facility and the relocation or elevation of vulnerable infrastructure.</p>	Community Development, Public Works	Very Low	None	NA	NA	Long-Term

5.2 Implementation and Monitoring Policies

CAP implementation and monitoring will require City leadership to execute CAP measures and actions, report on the progress of implementation and performance, and if necessary, alter or amend the CAP in the future to ensure that the plan remains effective and on track toward meeting its target. The following policies and actions were developed to guide CAP implementation and monitoring.

I-1: CAP Implementation Team

Establish a CAP Coordinator and multi-departmental CAP Implementation Team to implement, monitor, and report on the status of measures and actions identified in the CAP. The CAP Implementation Team will meet at least one time per year to assess the status of City efforts.

Implementation Actions:

- **I-1.1:** Form a multi-departmental CAP Implementation Team that meets annually to implement, monitor, and report on the status of measures and actions identified in the CAP.
- **I-1.2:** Designate a City staff member on the CAP Implementation Team to have lead responsibilities for overseeing CAP implementation and monitoring. Duties of this position include coordinating the CAP Implementation Team meetings, preparing the annual CAP progress report to City Council, and coordinating the GHG emissions inventory and CAP updates, as specified in this chapter.

I-2: CAP Measure Evaluation

Annually monitor and report on the implementation and performance of the CAP measures and actions.¹

Implementation Actions:

- **I-2.1:** Prepare an annual progress report for City Council review and identify the implementation status of each measure (including how new development projects have been implementing CAP measures);
 - Evaluate achievement of or progress toward performance criteria;²
 - Assess the effectiveness of measures included in the CAP;
 - Recommend adjustments to actions or tactics, as needed.

¹ While a full GHG emissions inventory is necessary to assess community-wide and local government progress toward the 2020 goal, the City can track progress between inventories and provide insight on the effectiveness of specific actions. By evaluating whether the implementation of a measure is on track to achieve its performance criteria, the City can identify successful measures, and re-evaluate or replace under-performing measures.

² The performance indicators, provided for each quantified measure, identify the level of participation or performance required to achieve the estimated level of GHG emissions reductions by 2020.

I-3: GHG Emissions Inventory and CAP Updates

Re-inventory GHG Emissions every five years to evaluate the performance of the CAP as a whole, and if necessary, alter or amend the CAP to ensure that the plan remains on track.³

Implementation Actions:

- **I-3.1:** Conduct a GHG inventory every five years and evaluate CAP performance.⁴
- **I-3.2:** Report on the State's implementation of state-level measures included in the CAP to ensure that the State is fulfilling its requirements.
- **I-3.3:** Update the CAP as necessary based on the results of the inventory, and to reflect updates to state-level measures and new programs or policies to reduce GHG emissions.

At this time, the State has not created a mandate for further reductions beyond the 2020 target. It has identified a long-term goal for State agencies of reducing emissions to 80 percent below 1990 emissions levels by 2050 (in Executive Order S-3-05), but has not adopted the target and does not plan for meeting this goal. As such, this CAP does not identify a target beyond 2020. As the year 2020 approaches, the State is likely to adopt a target for later years and, at that time Grover Beach will adopt a reduction target for a later year consistent with the State's longer-term target. However, if the State has not adopted a reduction target by 2020, the City will set a reduction target based on the State's long-term reduction trajectory.

5.3 Funding Sources

One of the main barriers to an implementation and monitoring plan is lack of available funds. There are multiple grant and loan programs through state, federal, and regional sources to reduce GHG emissions. This section identifies potential funding sources that Grover Beach could pursue to offset the financial cost of implementing the CAP measures.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. The programs listed below represent the current (2013) status of those options that are most relevant to the CAP. These funding sources could quickly become out-of-date; therefore, it is important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically. In addition, there are general sources of funding that provide the most up-to-date information and should be reviewed on a regular basis, including:

³ Inventory updates provide the best indication of CAP effectiveness as they will allow for comparison to the 2005 baseline. If an update reveals that the plan is not making progress toward meeting the GHG reduction target, the City will adjust the measures as necessary.

⁴ CEQA Section 15183.5 requires regular monitoring and reporting, and updates to the plan as needed to ensure it is on track with the established targets.

5.0 IMPLEMENTATION AND MONITORING

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| ■ U. S. Department of Energy | ■ CAL FIRE |
| ■ U.S. Environmental Protection Agency | ■ California Statewide Communities Development Authority |
| ■ U.S. Department of Housing and Urban Development | ■ Foundation for Renewable Energy and Environment |
| ■ California Energy Commission | ■ SLOCOG |
| ■ California Strategic Growth Council | ■ SoCalGas |
| ■ California Public Utilities Commission | ■ PG&E |
| ■ Caltrans | |

To reduce costs and improve the CAP's effectiveness, actions should be pursued concurrently whenever possible. Funding sources the City decides to pursue will be identified as implementation occurs.

The City can, in part, provide funding for various measures outlined in this CAP. This can be accomplished through the City's annual budgeting and Capital Improvement Program process which provides an opportunity for citizen input and guides decision-makers while helping them set priorities. The City can also partner with SLOCOG, local jurisdictions within San Luis Obispo County, community-based organizations, and private companies for joint programs.

5.3.1 ENERGY-RELATED FUNDING SOURCES

Many of the financing and incentive programs relevant to the CAP concern energy infrastructure and conservation. Some of these programs are tied to the American Recovery Reinvestment Act economic stimulus package enacted by Congress in February 2009. Access to these funds will be available for a limited period. The City should seek the most up-to-date information regarding the programs listed below.

Strategic Growth Council Sustainable Communities Planning Grant Program

California Strategic Growth Council

On behalf of the Strategic Growth Council, the Department of Conservation manages competitive grants to cities, counties, and designated regional agencies to promote sustainable community planning and natural resource conservation. The grant program supports development, adoption, and implementation of various planning elements. The Sustainable Communities Planning Grant Program offers a unique opportunity to improve and sustain the wise use of infrastructure and natural resources through a coordinated and collaborative approach.

Urban Greening for Sustainable Communities Grant Program

California Strategic Growth Council

Because of the built-out nature of California's urban areas, the Urban Greening for Sustainable Communities Program provides funds to preserve, enhance, increase, or establish community green areas such as urban forests, open spaces, wetlands, and community spaces (e.g., community gardens). The goal is for these greening projects to incrementally create more viable

5.0 IMPLEMENTATION AND MONITORING

and sustainable communities throughout the state. This program has both an Urban Greening Planning Program, which provides funds to assist entities in developing a master urban greening plan, and an Urban Greening Project Program, which provides funds for projects that preserve, enhance, increase or establish community green areas.

Urban and Community Forestry Grant Program

CAL FIRE

The CAL FIRE Urban and Community Forestry Program works to expand and improve the management of trees and related vegetation in communities throughout California. This program offers funding through a variety of grants. The Urban Forest Management Plan Grant funds the development and implementation of a management plan to be used by a jurisdiction to manage its urban forest. Such plans will be holistic and long-term, must include the entire jurisdiction and take an ecosystem management approach, and may include a minimum level of a training or educational component. Local jurisdictions may request between \$30,000 and \$100,000 and matching contributions totaling 25 percent of the total project cost is required. The Green Trees for the Golden State Grant provides funding for urban tree planting projects and up to two years of initial maintenance. Local jurisdictions may request between \$30,000 and \$100,000. Matching contributions totaling 25 percent of the total project cost is required.

California Investor Owned Utilities (IOUs) Programs

PG&E

California IOUs, such as PG&E, are required by the CPUC to offer energy efficiency programs to their customers. Each IOU program is unique; generally the programs offer rebates, financing assistance, design assistance, educational seminars, and other forms of assistance. PG&E's rebates may be calculated based on the amount of energy savings or, alternatively, may be fixed rate financial assistance for specific energy efficiency technology.

In conjunction with its rebates and incentives programs, PG&E offers an Energy-Efficiency Retrofit Loan Program, also known as On-Bill Financing. The program for public agencies includes: zero-percent financing on qualifying measures for up to ten years; offsets to energy-efficient upgrade costs after rebates and incentives through PG&E; loans ranging from a minimum of \$5,000 up to \$250,000 per meter; and loan installments added to monthly PG&E bills.

PG&E also offers the Green Communities and Innovator Pilots energy efficiency programs, which are administrated by PG&E, using funds from the Public Goods Charge (PGC) authorized by the California Public Utility Commission (CPUC). Customers of California's three largest investor-owned utility companies pay the PGC through their electric utility bills. Customers pay the surcharge per unit of consumption (kilowatt-hours). Money raised by the PGC is spent on services and programs deemed to be in the public interest, including energy efficiency initiatives such as Green Communities and Innovator Pilots.

SoCalGas

Southern California Gas Company offers On-Bill Financing with rebates for energy efficient natural gas equipment. For institutional customers, such as the City of Grover Beach, zero-percent financing is available from \$5,000 to \$250,000 per meter, with a maximum payback period of 10 years. Monthly loan payments are added directly to the customer's energy bill.

Energy Conservation Assistance Account Program (ECAA) Energy Efficiency Financing

California Energy Commission

The California Energy Commission offers low-interest loans (1-3 percent) to help local jurisdictions and other public agencies finance energy-efficient projects as part of the ECAA Program. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements. Examples of projects include: lighting systems, pumps and motors, energy efficient streetlights and traffic signals, automated energy management systems/controls, building insulation, renewable energy generation and combined heat and power projects, heating and air conditioning modifications, and wastewater treatment equipment. The maximum loan amount is \$3 million per application for 15 years. There is no minimum loan amount.

California Solar Initiative State Rebate Program

California Energy Commission & California Public Utilities Commission

California Solar Initiative will provide over \$2 billion in statewide incentives over the next decade for solar photovoltaic systems, as well as other solar thermal generating technologies, such as water heaters, on existing residential homes, and existing and new commercial, industrial, and agricultural properties. Photovoltaic incentives are available for systems up to one megawatt in size for homeowners, commercial/industrial, government and non-profit customers. The program pays solar consumers an incentive based on system performance.

California Feed-In Tariff

The California feed-in tariff allows eligible customer-generators to enter into 10-, 15- or 20-year standard contracts with their utilities to sell the electricity produced by small renewable energy systems -- up to three megawatts -- at time-differentiated market-based prices. Time-of-use adjustments will be applied by each utility and will reflect the increased value of the electricity to the utility during peak periods and its lesser value during off-peak periods. These tariffs are not available for facilities that have participated in the California Solar Initiative, Self-Generation Incentive Program, Renewables Portfolio Standard, or other ratepayer funded generation incentive programs, including net-metering tariffs. For customers generating renewable energy not covered by the California Solar Initiative or Self-Generation Incentive Program (e.g., biomass or geothermal) the feed-in tariff is applicable. If customers prefer a long-term contract at a fixed price over a financial incentive paid in the short term, feed-in tariffs may be a beneficial financing tool.

5.3.2 TRANSPORTATION-RELATED FUNDING SOURCES

Many federal, state, and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs.

Livability Grant Programs

Federal Transportation Authority

The Federal Transportation Authority provides resources on sustainable communities and transit oriented development. This includes access to transit oriented development resources

5.0 IMPLEMENTATION AND MONITORING

and training free of charge to local government employees. The Federal Transportation Authority's Livable and Sustainable Communities program supports initiatives that demonstrate ways to improve the link between public transit and communities. The Federal Transportation Authority offers a broad selection of Livability Grant Programs that fund projects for accessible, livable, and sustainable communities. In particular, the Bus and Bus Facilities Discretionary Program provides capital assistance for new buses and intermodal transit centers. The New Starts and Small Starts Program supports transit "guideway" capital investments, such as rapid rail, light rail, commuter rail, automated guideway transit, people movers, bus rapid transit, and other high occupancy vehicles. Additionally, the Intercity Bus Program supports transit access to residents in non-urbanized areas.

Alternative and Renewable Fuel and Vehicle Technology Program

California Energy Commission

Assembly Bill 118 created the Alternative and Renewable Fuel and Vehicle Technology Program, within the California Energy Commission. The statute authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's GHG reduction goals and reduce our dependence on foreign oil. The statute allows the Energy Commission to use grants, loans, loan guarantees, revolving loans, and other appropriate measures. Eligible recipients include: public agencies, private businesses, public-private partnerships, vehicle and technology consortia, workforce training partnerships and collaboratives, fleet owners, consumers, recreational boaters, and academic institutions. The Energy Commission must prepare and adopt an Investment Plan and convene an Advisory Committee to assist in preparing the Investment Plan. The Energy Commission has an annual program budget of approximately \$100 million.

Community-Based Transportation Planning Grant Program

Caltrans

The Community-Based Transportation Planning Grant Program is primarily used to seed planning activities that encourage livable communities. Grants assist local agencies to better integrate land use and transportation planning, to develop alternatives for addressing growth, and to assess efficient infrastructure investments that meet community needs. These planning activities are expected to help leverage projects that foster sustainable economies, increase available affordable housing, improve housing/jobs balance, encourage transit oriented and mixed use development, expand transportation choices, reflect community values, and include non-traditional participation in transportation decision making.

Local Assistance Program

Caltrans

Caltrans' Local Assistance Program oversees more than one billion dollars in federal and state funds annually available to over 600 cities, counties, and regional agencies for the purpose of improving their transportation infrastructure or providing transportation services.

Safe Routes to School Programs

Caltrans

Caltrans administers two separate Safe Routes to School Programs—one state program and one federal program. Both programs are intended to achieve the same basic goal of increasing the number of children walking and bicycling to school by making it safer for them to do so. Both programs fund qualifying infrastructure projects.

Bicycle Transportation Account

Caltrans

The Bicycle Transportation Account is an annual program providing state funds for city and county projects that improve safety and convenience for bicycle commuters. Caltrans expects to appropriate \$7.2 million annually for projects, on a matching basis with local jurisdictions. A wide variety of projects are eligible, including but not limited to new bikeways serving major transportation corridors, new bikeways removing travel barriers, and secure bicycle parking.

Environmental Enhancement and Mitigation Program

Caltrans

The Environmental Enhancement and Mitigation Program offers a total of \$10 million each year for grants to local, state, and federal government agencies and to nonprofit organizations for projects to mitigate the environmental impacts caused by new or modified public transportation facilities. Eligible projects must be directly or indirectly related to the environmental impact of the modification of an existing transportation facility or construction of a new transportation facility. Two of the grant categories include Highway Landscaping and Urban Forestry Projects, which are designed to offset vehicular emissions of carbon dioxide through the planting of trees and other suitable plants, and Roadside Recreation Projects, which provide for the acquisition and/or development of roadside recreational opportunities.

Highway Safety Improvement Program

Caltrans

The Highway Safety Improvement Program provides federal funding for work on any public road or publicly owned bicycle/pedestrian pathway or trail that corrects or improves the safety for its users. The program is intended to reduce traffic fatalities and serious injuries on all public roads. Local jurisdictions, such as counties and cities, may apply to Caltrans for funding ranging from \$100,000 to \$900,000 per project. Federal reimbursements cover up to 90 percent of total project costs. Eligible projects include, but are not limited to, improvements for pedestrian or bicyclist safety, intersection safety improvements, and shoulder widening.

Community Development Block Grant

California Department of Housing and Community Development

The Community Development Block Grant (CDBG) program funds projects and programs that develop viable urban communities by providing decent housing and a suitable living environment and by expanding economic opportunities, principally for persons of low and moderate income. Federal CDBG Grantees may use funds for activities that include, but are not limited to, acquiring real property; building public facilities and improvements, such as streets,

5.0 IMPLEMENTATION AND MONITORING

sidewalks, and recreational facilities; and planning and administrative expenses, such as costs related to developing a consolidated plan and managing CDBG funds. The State makes funds available to eligible agencies (cities and counties) through a variety of different grant programs.

Infill Infrastructure Grant Program

California Department of Housing and Community Development

The Infill Infrastructure Grant Program assists in the new construction and rehabilitation of infrastructure that supports higher-density affordable housing and mixed-income housing in locations designated as infill. Eligible applicants include, but are not limited to, localities and public housing authorities.

National Recreational Trails Program

California Department of Parks and Recreation

In California, the National Recreational Trails Program is administered by Department of Parks and Recreation to provide funding to develop recreational trails and related facilities for uses such as bicycling and hiking.

Federal Transportation Improvement Program for the San Luis Obispo County Region

SLOCOG

The Federal Transportation Improvement Program (FTIP) is a comprehensive listing of federally funded surface transportation projects in San Luis Obispo County. SLOCOG prepares and adopts the FTIP every two years in close cooperation with stakeholders such as cities and counties. As part of the FTIP, SLOCOG plans for the spending of flexible funding from the federal Surface Transportation Program, which applies to the following types of projects: enhanced transit services, expanding technology, freeway express bus stops, ridesharing, vanpooling, parallel routes along major transportation corridors, and Park-n-Ride lots. SLOCOG selects projects that promote the strategies and policies of the Regional Transportation Plan.

The FTIP also includes the allocation of funding under the state Transportation Development Act (TDA). Each year, SLOCOG disburses approximately \$10 million in funding from the TDA toward bicycle and pedestrian infrastructure, traffic calming, and other planning and capital improvement projects in the region.

Infrastructure State Revolving Fund Program

California Infrastructure and Economic Development Bank

The Infrastructure State Revolving Fund Program provides low-cost financing to public agencies for a wide variety of infrastructure projects. Program funding is available in amounts ranging from \$250,000 to \$10 million, with loan terms of up to 30 years. Interest rates are set on a monthly basis. Eligible project categories include city streets, county highways, state highways, drainage, water supply and flood control, educational facilities, environmental mitigation measures, parks and recreational facilities, port facilities, public transit, sewage collection and treatment, solid waste collection and disposal, water treatment and distribution, defense conversion, public safety facilities, and power and communications facilities.

5.3.3 SOLID WASTE-RELATED FUNDING SOURCES

Beverage Container Recycling Grant and Payment Programs

California Department of Resources Recycling and Recovery (CalRecycle)

CalRecycle administers funding programs to assist organizations with establishing convenient beverage container recycling and litter abatement projects, and to encourage market development and expansion activities for beverage container materials. The Beverage Container Recycling Grant provides funding to local governments, businesses, individuals, and non-profit organizations for projects that implement new programs or enhance existing programs to provide convenient beverage container recycling opportunities in various locations statewide. Eligible projects include, but are not limited to, the following locations: parks and recreational areas, sporting complexes, community events, office buildings, multifamily dwellings, entertainment/hospitality venues, curbside, restaurants, and schools and colleges. CalRecycle issues up to \$1.5 million annually for this program. The City/County Payment Program provides a total of \$10.5 million in grant funds annually to eligible cities and counties for beverage container recycling and litter abatement activities. Each city is eligible to receive a minimum of \$5,000 or an amount calculated by the Department based on per capita, whichever is greater.

5.3.4 OTHER FUNDING SOURCES

Community Assistance Grant

Bureau of Land Management

Funds are available to assist with hazardous fuels treatments, community wildfire protection planning, and education addressing wildfire safety and hazard risk reduction within the wildland-urban interface. Treatments may be focused on both Federal (with prior approval from local Bureau of Land Management field staff) and non-federal lands and aimed toward protecting communities at risk and resource values identified within a Community Wildfire Protection Plan and/or Community Fire Plans with an interdisciplinary and interagency collaborative process.

Wildland Urban Interface Grant

Fish and Wildlife Service

Wildland Urban Interface funds are available for hazard mitigation projects that protect communities at risk of wildfire by reducing hazardous fuels (non-federal lands), developing Community Wildfire Protection Plans (includes associated planning and compliance documents), and implementing wildfire education and outreach initiatives.

Partnerships with Other Jurisdictions and Community Organizations

Partnering with neighboring jurisdictions and community organizations is a key implementation strategy supporting the CAP. Various jurisdictions and organizations within the County could serve as potential partners in implementing the CAP strategies. The City should seek to partner with appropriate local governments, as identified within CAP measures.

CHAPTER 6

REFERENCES AND PREPARERS

6.0 References and Preparers

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6.2 List of Preparers

This CAP was prepared by Rincon Consultants, Inc. under contract to the APCD and City of Grover Beach. Persons involved in research, analysis, report preparation, project management, and quality control include:

Richard Daulton, Principal-in-Charge, Rincon Consultants
Shauna Callery, Project Manager, Rincon Consultants
Rob Fitzroy, Senior Planner, Rincon Consultants
Christina McAdams, Associate, Rincon Consultants
Karly Kaufman, Associate, Rincon Consultants
Jon Berlin, Associate, Rincon Consultants

Fehr & Peers
Raimi + Associates
Nelson/Nygaard Consulting Associates
Krout & Associates

GLOSSARY

OF TERMS

Glossary of Terms

Actions: The steps that will be taken to implement the Climate Action Plan measures.

Adaptation: The ability to adjust to, or minimize, the potential impacts of climate change or other environmental disturbances.

Baseline Emissions: The amount of GHG emissions released in a designated year against which future changes in emissions levels are measured.

Business-as-Usual: A scenario used for the projection of GHG emissions at a future date based on current technologies and regulatory requirements in absence of other reductions.

California Environmental Quality Act (CEQA): A statute that requires state and local agencies to evaluate the environmental impacts of private or public proposed projects they undertake or permit and to avoid or mitigate potentially impacts, if feasible. If a proposed action has the potential for a significant environmental impact, an environmental impact report (EIR) must be prepared and certified before action can be taken.

Carbon Dioxide (CO₂): A naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic GHG that affects the Earth's radiative balance. It is the reference gas against which other GHGs are measured and therefore has a Global Warming Potential of 1.

Carbon Dioxide Equivalent (CO₂e): A metric used to compare the emissions from various greenhouse gases based upon their global warming potential, or potency. Carbon dioxide equivalents are commonly expressed as "metric tons of carbon dioxide equivalents" (MT CO₂e). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated global warming potential. For example, the global warming potential for methane is 21. This means that one metric ton of methane is equivalent to 21 metric tons of carbon dioxide.

Carbon Sequestration: The process through which agricultural and forestry practices remove carbon dioxide from the atmosphere. The term "carbon sinks" is also used to describe agricultural and forestry lands that absorb carbon dioxide.

Chlorofluorocarbons (CFCs): A family of inert, nontoxic, and easily liquefied chemicals used in refrigeration, air conditioning, packaging, insulation, or as solvents and aerosol propellants. Because CFCs are not destroyed in the lower atmosphere, they drift into the upper atmosphere, where their chlorine components destroy ozone.

Climate: Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period is three decades, as defined by the World Meteorological Organization. These quantities

are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

Climate Action Plan: A description of the measures and actions that a local government will take to reduce GHG emissions and achieve an emissions reduction target. Most plans include a description of existing and future year emissions; a reduction target; a set of measures, including performance standards, that will collectively achieve the target; and a mechanism to monitor the plan and require amendment if it is not achieving specified levels. Interchangeable with GHG Reduction Plan.

Climate Change: Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g. changes in ocean circulation); human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.).

Co-Benefit: Additional benefits that occur as a result of GHG reduction measures. These include financial savings, improved air quality, increased health or safety, natural resource conservation, reduced energy use, etc.

Connectivity: A well connected circulation system with minimal physical barriers that provides continuous, safe, and convenient travel for all users of streets, roads, and highways.

Emissions: The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Emissions Factor: A set of coefficients used to convert data provided on energy use and energy use reductions to emissions. These emission factors are the ratio of emissions of a particular pollutant (e.g., carbon dioxide) to the quantity of the fuel used (e.g., kilograms of coal). For example, when burned, 1 ton of coal = 2.071 tons of CO₂.

Emissions Forecast: The projected emissions that would occur in a future year based on growth multipliers applied to the baseline year.

Energy Conservation: Reducing energy consumption. Energy conservation can be achieved through energy efficiency (getting the most productivity from each unit of energy) or by reduced use of energy such as turning off appliances when not in use.

Energy Efficiency: Using less energy to provide the same level of service or complete the same task. For example, a more efficient light will use less electricity to provide the same amount of illumination.

Fossil Fuel: A general term for combustible geologic deposits of carbon, including coal, oil, natural gas, oil shale, and tar sands. These fuels emit carbon dioxide into the atmosphere when burned, thus significantly contributing to the enhanced greenhouse effect.

Fuel Efficiency: The distance a vehicle can travel on an amount of fuel. This is most often measured in miles traveled per gallon of fuel. A higher-efficiency vehicle travels farther on a gallon of fuel than similar vehicles.

Global Warming: Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of GHGs.

Green Building: Green, or sustainable, building is the practice of creating and using healthier and more resource-efficient models of construction, renovation, operation, maintenance and demolition.

Greenhouse Effect: Trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. Some of the heat flowing back toward space from the Earth's surface is absorbed by water vapor, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the Earth's surface. If the atmospheric concentrations of these GHGs rise, the average temperature of the lower atmosphere will gradually increase.

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O₃), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

Greenhouse Gas Emissions Inventory: A GHG emissions inventory provides estimates of the amount of GHGs emitted to and removed from the atmosphere by human activities. A city or county that conducts an inventory looks at both community emission sources as well as emissions from government operations. A base year is chosen and used to gather all data from that year. Inventories include data collection from such things as vehicle miles traveled (VMTs), energy usage from electricity and gas, and waste. Inventories include estimates for carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), which are referred to as the "six Kyoto gases."

Hydrofluorocarbons (HFCs): Man-made compounds containing hydrogen, fluorine, and carbon, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products, that have a range of global warming potentials. HFCs do not have the potential to destroy stratospheric ozone, but they are still powerful GHGs.

Infill Site: A site in an urbanized area that meets criteria defined in Public Resources Code Section 21061.3.

Intergovernmental Panel on Climate Change (IPCC): The IPCC was established jointly by the United Nations Environment Program and the World Meteorological Organization in 1988. The purpose of the IPCC is to assess information in the scientific and technical literature related to all significant components of the issue of climate change. The IPCC draws upon hundreds of the world's expert scientists as authors and thousands as expert reviewers. Leading experts on climate change and environmental, social, and economic sciences from some 60 nations have helped the IPCC to prepare periodic assessments of the scientific underpinnings for understanding global climate change and its consequences. With its capacity for reporting on climate change, its consequences, and the viability of adaptation and mitigation measures, the IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue. For example, the IPCC organized the development of internationally accepted methods for conducting national GHG emission inventories.

Kilowatt (kW): One thousand watts.

Kilowatt-hour (kWh): an amount of electricity equivalent to the use of one kilowatt for one hour. A hundred watt light bulb that is on for 10 hours uses one kilowatt-hour of electricity (100 watts x 10 hours = 1,000 watt-hours = 1 kilowatt-hour). Electricity production or consumption is often expressed as kilowatt- or megawatt-hours produced or consumed during a period of time.

Methane (CH₄): A hydrocarbon that is a GHG with a global warming potential estimated at 21 times that of carbon dioxide (CO₂). Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Measure: A way to reduce GHG emissions.

Metric Ton (MT): Common international measurement for the quantity of GHG emissions. A metric ton is equal to 2,205 pounds or 1.1 short tons.

Mitigation: An action to either reduce the amount of GHGs being emitted into the atmosphere or remove previously emitted gases from the atmosphere.

Mixed-Use: Mixed Use development means combining a variety of compatible land uses in a single development, and can be creatively used to create vibrant centers for living, working, and shopping. The primary purpose of the Mixed-Use land use designations is to implement the principals of smart growth by applying the designation to certain areas along the City's main transportation corridors that could successfully support a combination of uses (multi-family residential, retail, office uses, etc.) within a single development plan.

Natural Gas: Underground deposits of gases consisting of 50 to 90 percent methane and small amounts of heavier gaseous hydrocarbon compounds such as propane and butane.

Perfluorocarbons (PFCs): Potent GHGs that accumulate in the atmosphere and remain there for thousands of years. Aluminum production and semiconductor manufacture are the largest known man-made sources of perfluorocarbons.

Recycling: Collecting and reprocessing a resource so it can be used again. An example is collecting aluminum cans, melting them down, and using the aluminum to make new cans or other aluminum products.

Renewable Energy: Energy generated from sources that are naturally replenished or not used up in the course of providing power (e.g., wind, solar, biomass, and geothermal).

Retrofit: The addition of new technology or features to older systems. For example, adding new energy-efficient lamps to existing lighting fixtures.

Sector: A term used to describe GHG emission inventory source categories for GHGs based on broad economic sectors.

Smart Growth: A compact, efficient, and environmentally sensitive pattern of development that provides people with additional travel, housing, and employment choices by focusing future growth closer to existing and planned job centers and public facilities, while preserving open space and natural resources.

Solar Photovoltaic (PV): A system that converts sunlight directly into electricity using cells made of silicon or other conductive materials. When sunlight hits the cells, a chemical reaction occurs, resulting in the release of electricity.

Source: Any process or activity that releases a GHG into the atmosphere.

Target Year: The year by which the GHG emissions reduction target should be achieved.

Transportation Demand Management (TDM): A general term for strategies that increase overall system efficiency by encouraging a shift from single-occupant vehicle trips to non-single-occupant vehicle modes, or shifting auto trips out of peak periods. TDM seeks to facilitate this shift by increasing travel options, by providing incentives and information, or by reducing the physical need to travel through transportation-efficient land uses.

Vehicle-Miles Traveled (VMT): One vehicle traveling the distance of one mile. Total vehicle miles is the aggregate mileage traveled by all vehicles. VMT is a key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve air quality goals.