CITY OF OCEANSIDE
ENERGY CLIMATE ACTION ELEMENT

GENERAL PLAN UPDATE





MAY 2019

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CHAPTER 1

INTRODUCTION

1.1 Purpose

Over the past 150 years, industrialization and other forms of technological advancement have improved quality of life and extended life expectancy across the globe. At the same time, this progress has resulted in continued depletion of natural resources, harmful levels of soil, water, air pollution, and a burgeoning waste stream. Additionally, the burning of fossil fuels, deforestation, solid waste decomposition, and many contemporary agricultural practices are contributing to a growing concentration of carbon dioxide and other greenhouse gases (GHGs) in the Earth's atmosphere, resulting in greater absorption of solar energy and, in turn, an increase in average global temperatures.

Efforts are underway at all levels of government, business, and civil society to find ways to accommodate human needs and aspirations without further despoiling the planet. In keeping with these efforts, the Energy and Climate Action Element (ECAE) addresses energy consumption and other activities within the City of Oceanside that may contribute to adverse environmental impacts, with particular emphasis on those activities associated with human-induced climate change.

1.1.1 Sustainability: Preserving the Planet for Future Generations

Sustainability refers to a balanced approach to managing change, wherein finite resources are conserved and quality of life is maintained for future generations.

The ECAE outlines goals and policies meant to incorporate the concept of **sustainability** into the City's decision-making process, including its long-range planning projects, development review protocols, community engagement efforts, and capital improvement programs. A sustainable approach to growth and change includes the promotion of renewable energy and energy efficiency, efficient land use patterns and transportation systems, water conservation, solid waste reduction, low and zero-emission commercial and industrial operations, local food systems, urban forestry, and other pursuits that minimize environmental impacts while contributing to economic development and quality of life. These and other sustainable practices are key to limiting the concentration of GHGs in the Earth's atmosphere and thereby avoiding further destabilization of the Earth's climate. Table 1 illustrates how these practices have been employed as organizing themes in the ECAE, providing a cogent framework for the element's goals, policies, and implementing actions. These themes also structure the City's Climate Action Plan (CAP), which outlines the specific measures the City will take to reduce local GHG emissions. The CAP is appended to the ECAE as Appendix A.1.

Sustainability is furthered through conscientious, targeted investment in plans, products, and systems that reduce reliance on fossil fuels and other non-renewable materials and facilitate responsible stewardship of natural resources essential to human well-being and survival. The goals and policies of the ECAE promote such investment in both the public and private sector. Several goals and policies call upon the City itself to implement new programs (e.g., pursuing a renewable energy portfolio) and expand existing efforts (e.g., solid waste management, water conservation). Other goals and policies encourage residents and businesses to invest in energy efficiency upgrades, solar power generation, electric vehicles (EVs), renewable and reusable packaging, etc. Ultimately, long-term sustainability and GHG emissions reduction will require a substantial shift in how and where we spend money to supply energy to our homes and businesses, meet our transportation needs, dispose of our waste, access potable water, and nourish ourselves. The goals and policies of the ECAE provide direction on how such a shift can occur at the local level.

A sustainable community requires investment in institutional changes (e.g., updated plans, new programs), technological innovations (e.g., solar power, zero-emission vehicles), and skilled human resources capable of implementing, maintaining, and improving upon sustainable practices.

TABLE 1: ORGANIZING THEMES FOR ECAE GOALS AND POLICIES

Energy Efficiency and Renewable Energy	The City will pursue a renewable electric energy portfolio to meet the City's future electricity needs while encouraging residents and the local business community to pursue energy efficiency.
Smart Growth and Multimodal Transportation	The City will ensure that land use policy and zoning regulations facilitate efficient land use to accommodate future population, housing, and employment growth. The City will promote a transition from combustion engines to zero-emission vehicles by enabling the expansion of charging/fueling infrastructure and exploring other ways to incentivize the purchase of zero emission vehicles by Oceanside residents and businesses.
Zero Waste	The City will continue to reduce the percentage of solid waste deposited in landfills by reducing overall waste generation, increasing recycling, and diverting organics and other green waste back to the land to serve agriculture and other productive and community-enriching activities.
Water Conservation	The City will continue to reduce per-capita water consumption and increase the percentage of water sourced locally.
Urban Greening	The City will facilitate the expansion of the urban forest, both within the public realm and on private property.
Local Agriculture	The City will encourage the preservation of existing agricultural land, expansion of urban agriculture, and soil management

	methods that sequester carbon in the ground.
Sustainable Consumption	The City will promote community awareness of the environmental impacts of consumer choices and encourage the business community to implement sustainable purchasing practices.

2035 is the planning horizon for the City's General Plan Update (GPU).

The specific goals and policies of the ECAE are outlined in Chapter 9. Taken together, these goals and policies provide a supportive framework for a CAP, which, in accordance with the California Environmental Quality Act (CEQA), outlines a range of measures designed to mitigate projected GHG emissions associated with future population, housing, and employment growth in Oceanside through 2035. Additionally, these goals and policies are meant to promote collaboration across City disciplines, as staff in Development Services, Public Works, Water Utilities, the City Manager's Office, and other departments integrate sustainability into their decision-making.

The ECAE helps to establish priorities for department-level budgeting and program development, while promoting a multi-disciplinary approach to sustainability that utilizes the City's fiscal and human resources in an efficient and cost-effective manner. With respect to long-range planning, ECAE goals and policies will guide the updating of the City's existing General Plan elements (e.g., Land Use, Circulation, Community Facilities, Conservation). Policies will focus on sustainability and provide a comprehensive vision of Oceanside as a community that addresses growth and change in ways that preserve its greatest assets for future generations.

1.1.2 Global Concern, Global Action

While there is much that can be achieved at the local level, it must be acknowledged that many aspects of sustainability are outside of the City's purview. While the City can leverage its land use authority, public outreach capabilities, and buying power to promote GHG emissions reduction and other sustainable actions, climate change and other environmental challenges are global concerns that require action at the regional, state, national, and international levels.

1.2 International Efforts

At the international level, climate science and policy have been driven by the United Nations Framework Convention on Climate Change (UNFCC), established in 1992. The UNFCC promotes international cooperation to both limit global GHG emissions and cope with the current and projected impacts of climate change. In 1995, the UNFCC facilitated negotiations to strengthen the global response to climate change. These negotiations resulted in the Kyoto Protocol, which legally binds developed countries to emission reduction targets. There are now 197 countries participating in the UNFCC and 192 signatories of the Kyoto Protocol.

In 2015, the UNFCC forged the Paris Agreement, charting a new course in the global effort to combat climate change. The agreement accelerates and intensifies action and investment in the service of a low carbon future. Its central aim is to limit global temperature rise in the 21st century to less than 2° C (3.6° F) above pre-industrial levels. The agreement also aims to strengthen the ability of countries to deal with the impacts of climate change, outlining financing goals and capacity-building efforts. The United States is currently not a party to the Paris Agreement.

Climate Neutral Now, an initiative sponsored by the UNFCC, invites companies, organizations, governments, and citizens to work towards climate neutrality by measuring their GHG emissions, reducing them to the extent feasible, and offsetting those emissions that cannot be avoided by investing in uncertified emission reductions projects.

The goals and policies of the UNFCC are informed by the work of the Intergovernmental Panel on Climate Change (IPCC), a scientific body that provides policymakers with regular assessments of climate change, its impacts and future risks, and options for adaptation and mitigation. These assessments project future climate change based on different scenarios and discuss possible responses. They do not prescribe what actions should be taken to mitigate and adapt to climate change.

INCREASING GLOBAL DEMAND

Rapid population growth, rising incomes, and technological innovation are contributing to increasing global demand for food, energy, housing, transportation, and an ever-expanding variety of commercial goods and services. The following examples speak to the challenge of meeting increasing demand with finite resources.

- With the world's population increasing by more than two billion people over the next 30 years, global demand for food is expected to increase by as much as 50 percent by 2050.
- Despite increasing energy efficiency, global demand for energy is expected to grow by nearly 30 percent by 2035.
- Population growth, rising standards of living, smaller household sizes, and rural-to-urban migration are prompting new housing construction on the order of 60 million dwelling units per year.
- With electricity and other power sources becoming more available in developing countries, global sales of household appliances are increasing by nearly six percent annually.
- Driven by a globalizing economy, rising incomes, and growth in international tourism, worldwide air travel is projected to nearly double by 2035.

1.3 National Efforts

*The United Nations' **Climate Neutral Now** initiative calls for investment in emissions reduction projects around the world.*

U.S. climate policy has shifted under different presidential administrations. Current federal standards related to vehicle fuel economy and power plant emissions are subject to change, as are federal funding programs.

In 1975, the U.S. Congress enacted the Corporate Average Fuel Economy (CAFE) Standards, which established average fuel economy requirements for automakers selling vehicles in the United States. While originally intended to protect U.S. energy supplies, these standards have had the effect of significantly reducing GHG emissions in the transportation sector. In 2012, the Obama Administration established stricter CAFE standards, requiring average fleet-wide fuel economy of 54.5 miles per gallon by 2025.

In 2015, the Obama Administration enacted the Clean Power Plan (CPP), which requires states to meet specific standards for the reduction of carbon dioxide emissions. Per the CPP, state emissions reduction plans must focus on three objectives:

1. Increasing the efficiency of existing fossil fuel power plants;
2. Replacing coal with natural gas; and
3. Replacing fossil fuels (both coal and natural gas) with zero-emission renewable energy sources.

The CPP has been subject to congressional opposition and may be repealed or significantly rolled back by the current administration.

The U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), U.S. Department of Transportation (DOT), and other federal agencies have provided funding and other resources for a wide range of state, regional, and local initiatives that contribute to GHG emissions reduction. EPA's Multipurpose Grants to States and Tribes support implementation of air and state-led climate activities and other state-defined high priority activities. DOE offers funding for applied research on energy efficiency, renewable energy, and clean transportation technologies. DOT provides state and local governments with resources to identify and remove barriers to improving pedestrian and bicycle safety, with the goal of increasing active transportation. With the adoption of the ECAE and CAP, the City has enhanced its eligibility for federal funding in support of climate action.

1.4 State Efforts

As outlined in a subsequent section of the ECAE, the State of California has made an extraordinary commitment to reducing statewide GHG emissions. The climate action goals, strategies, and mandates enacted by Governor Schwarzenegger and furthered by Governor Brown have placed California at the forefront of the global effort to address climate change. State legislation has established 2020 and 2030 statewide emissions reduction targets, created an emissions cap-and-trade program, instituted vehicle fuel content and efficient standards, mandated that electric utilities achieve a 50% minimum renewable power portfolio by 2030, and required metropolitan planning organizations like the San Diego Association of Governments (SANDAG) to prepare regional plans that have the effect of reducing vehicle miles traveled (VMT). With respect to VMT reduction, success depends on collaboration between metropolitan planning organizations (MPOs) and local governments, particularly on the allocation of funding for local and regional transportation projects.

1.4.1 Climate Action, American Values, and Economic Prosperity

To a large extent, the success of the City's efforts to encourage and implement sustainable practices, (including those focused on GHG emissions reduction) will hinge on how well these practices align with fundamental American values: self-determination, free enterprise, private property rights, equal protection under the law, etc. In the United States, a command and control approach to sustainability is not an option. Rather, sustainability must be pursued in a manner that respects freedom of choice, market forces, and the cost sensitivities of consumers and businesses. Consequently, the ECAE embodies a versatile and opportunistic approach to sustainability that focuses on:

1	Setting a positive example for the community through a sustainable approach to local governance;
2	Enhancing awareness of the environmental consequences (positive and negative) of our collective and individual actions;
3	Providing incentives for sustainable choices;
4	Leveraging existing “green” programs; and
5	Sourcing renewable energy, expanding transit and active transportation options, increasing local food options, etc.

A benefit-cost analysis of the GHG emissions reduction measures in the CAP shows that most of these measures will have long-term financial benefits to residents, businesses, and municipal operations. The benefit-cost analysis is appended to the ECAE as Appendix A.1.

Both the ECAE and CAP demonstrate that the City of Oceanside is committed to a cost-effective and equitable approach to sustainability that promotes local economic growth and enhanced quality of life for residents, workers, and visitors. ECAE goals and policies, as well as CAP emissions reduction measures, rely on incentives over mandates and support actions that provide positive returns on investment. At the same time, the ECAE encourages immediate and sustained action on the part of residents, businesses, and local government, given that the negative effects of climate change are now readily apparent.

Fundamentally, the ECAE seeks to encourage what might be termed as “The Cornucopia of the Commons.” This means exerting consistent, responsible actions on the part of individual stakeholders that, in sum, serve the common good. Such actions should be conscious and, to the greatest extent possible, voluntary. Households that choose to install efficient lighting and appliances, businesses that choose to purchase renewable packaging materials, and residents who choose to walk or ride their bike to the store are examples of stakeholders who make choices that are essential to the ultimate success of climate action programs.

1.4.2 Recognizing Constraints and Seizing Opportunities

The goals, policies, and implementing actions of the ECAE embody a pragmatic approach that accounts for factors that both facilitate and limit the City's efforts to reduce its carbon footprint and achieve long-term sustainability. By acknowledging local and regional conditions, focusing on strategies that can be executed with existing resources, and balancing climate action with other priorities (e.g., economic development), such an approach enhances the likelihood of effective implementation. The factors influencing the direction of climate action in the City of Oceanside, such as demographics, location, land use patterns, transportation systems, and fiscal resources, are discussed in subsequent sections of the ECAE. To the extent these factors change in the future, new opportunities for climate action may emerge.

CHAPTER 2

CLIMATE CHANGE

2.1 Climate Change

When we speak of "climate," we refer to the prevailing weather conditions of a region – surface temperature, air pressure, humidity, precipitation, wind, cloud cover, etc. – averaged over a series of years. In keeping with the protocol of the World Meteorological Organization (WHO), the standard averaging period for climate is 30 years. What we experience as "weather" on a day-to-day basis is a manifestation of climate, but not necessarily indicative of climate "normals" – i.e., reference points used to compare current climate trends to that of the past. The early 20th century geographer Andrew John Herbertson famously distinguished "climate" from "weather" in this way: **"Climate is what we may expect. Weather is what we actually get."**

Climate change generally refers to a lasting deviation in weather patterns relative to long-term average conditions.

Global warming is often used to refer to climate change, this term refers only to increasing average temperature and not associated climatic trends.

Climate change involves a statistically significant increase or decrease in average surface temperature that brings about changes in other climatic phenomena like rainfall, wind patterns, and storm events. Fluctuations in weather patterns over periods of less than a few decades, often called "oscillations" (e.g., El Niño), do not qualify as climate change.

Over the Earth's history, climate change has been caused by natural forces such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions. However, over the past century, certain human activities have been identified by the International Panel on Climate Change, the National Aeronautics and Space Administration, the Union of Concerned Scientist, and many other science based organizations as primary causes of evolving changes in the Earth's climate. Consequently, the term "climate change" is often used to refer specifically to anthropogenic (i.e., human-induced) climate change.

The term "climate change" has been incorporated into the titles of two of the most prominent international forums on the Earth's changing climate: the Intergovernmental Panel on Climate Change (IPCC) and the UN Framework Convention on Climate Change (UNFCCC).

2.2 Measurement of Climate Change

Reliable measurement of the earth's average surface temperature dates to the 1850s, when instruments and methods were standardized and the number of land and water-based measuring stations significantly increased. Today, it is common for measurements of global temperature trends to extend back to the 1880s.

Comparison of global average surface temperatures is typically presented in terms of anomalies, rather than absolute temperatures. Temperature anomalies are measured against a reference value or long-term average. For example, if the reference value is 15 °C, and the measured temperature is 17 °C, then the temperature anomaly is +2 °C. Temperature anomalies tend to be highly correlated over large distances, whereas absolute temperatures vary markedly over even short distances.

At present, the following are the most prominent sources of global surface temperature measurement and analysis:

HADCRUT

A dataset of monthly instrumental temperature records formed by combining the sea surface temperature records compiled by the Hadley Centre of the UK Met Office and the land surface air temperature records compiled by the Climatic Research Unit (CRU) of the University of East Anglia.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

An agency of the U.S. government that manages the National Centers for Environmental Information, whose main offices are located in Asheville NC, Boulder CO, Silver Spring MD, and the Stennis Space Center in Hancock County, Mississippi.

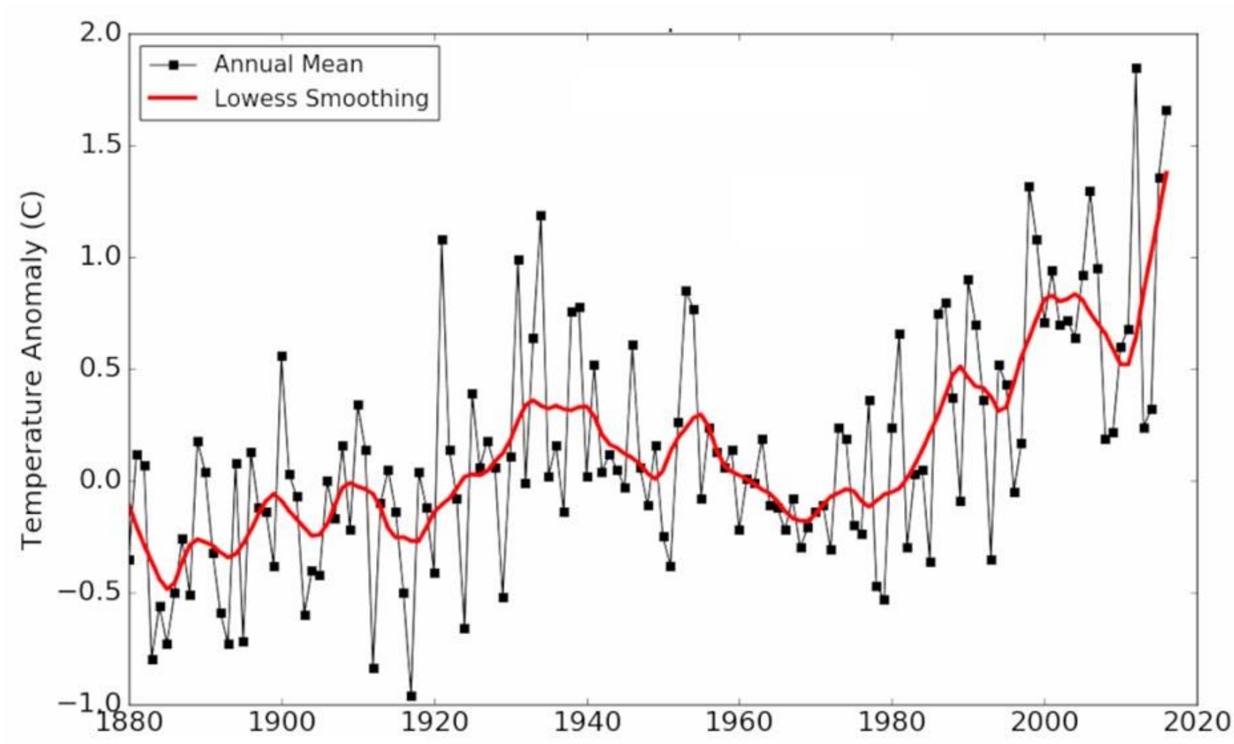
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

An independent agency of the executive branch of the U.S. government that includes the Goddard Institute of Space Science (GISS), which utilizes data collected by satellites and space probes to conduct atmospheric modeling.

While these sources of measurement and analysis are largely independent of one another, their findings on global temperature changes have been generally consistent.

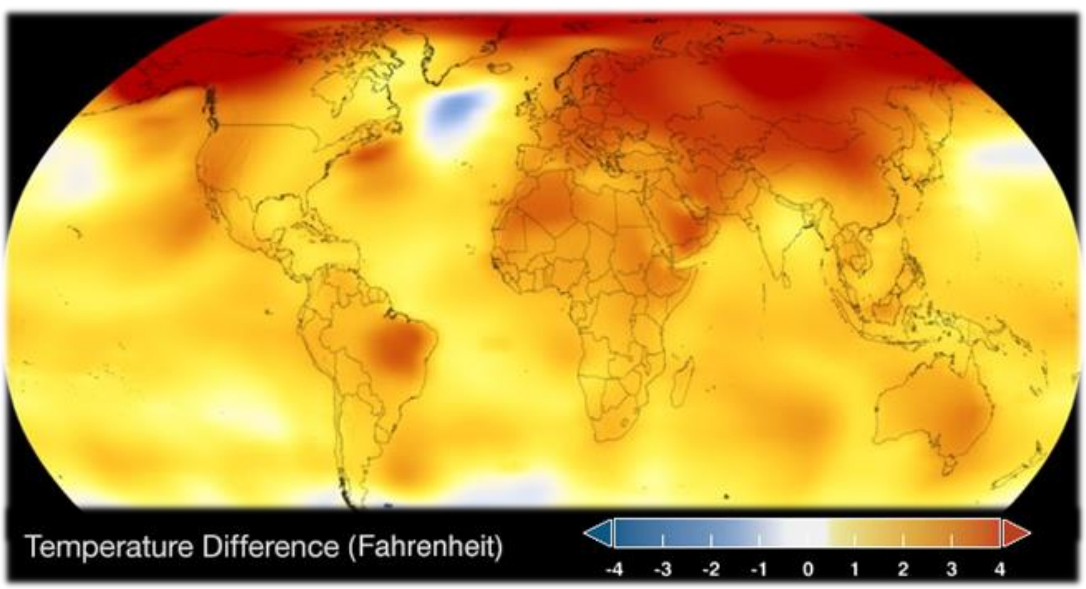
Figure 1 illustrates the trend in U.S. average annual temperature between 1880 and 2017. While cooling trends occurred in the early 1900s and following the onset of the Second World War, global temperatures generally trended upward over this 137-year timeframe, with the most pronounced increases occurring since the late 1970s. The U.S. average temperature in 2017 was more than one degree Celsius (1.8° F) warmer than the mid-20th century average.

Figure 1: Average U.S. Annual Temperature: 1880-2017



Source: NASA/GISS

Figure 2: Average Annual Temperature Differences: 1884-2017



Source: NASA/GISS (NASA Scientific Visualization Studio)

The cooling trend between the 1940s and early 1970s is commonly attributed to microscopic sulfate particles (aerosols) resulting from fossil fuel and biomass combustion. Sulfate aerosols in the Earth's atmosphere reduce the amount of solar radiation that reaches the Earth's surface, resulting in a cooling effect. Sulfate aerosols also increase the acidity of the atmosphere and form acid rain. Regulation has significantly reduced the concentration of sulfate aerosols in the Earth's atmosphere.

Figure 2 uses color coding to illustrate the change in average annual temperature across the planet between 1884 and 2017. The color coding reveals that over this period of time warming was most pronounced in the Northern Hemisphere, particularly in areas near the Arctic Circle. Over this 133-year period, Southern California and other parts of the western United States experienced an increase in average annual temperature of roughly 2° F.

The EPA acknowledges that average temperatures have risen across the contiguous 48 states since 1901, with an increased rate of warming over the past 30 years. Eight of the top 10 warmest years on record have occurred since 1998. Average global temperatures show a similar trend, and all of the 10 warmest years on record worldwide have occurred since 1998. Within the United States, temperatures in parts of the North, West, and Alaska have increased the most.

According to NOAA, the July 2018 average temperature across the world's land and ocean surfaces was 0.75° C (1.35° F) above the 20th century average of 15.8° C (60.4° F) and the fourth highest for July since global records began in 1880. The contiguous U.S. had its 11th highest July temperature. Several locations across California set new daily and monthly July temperature records. Downtown Los Angeles set a new minimum nighttime temperature in July, when temperatures dropped to only 26.1° C (79.0° F).

Increasing temperatures are resulting in other profound changes – on land, in the oceans, and in the atmosphere. The following phenomena are indicators of climate change:

In typically wet regions, rain events are becoming more intense.

In typically dry regions, droughts are becoming more frequent and prolonged.

As the oceans grow warmer, sea levels are rising. Sea level rise is due in part to melting sea ice and in part to the thermal expansion of ocean water. It should be noted that sea level rise along the west coast of the United States has lagged behind the global average, due to differences in land movement and coastal circulation patterns.

Since the 1950s, flooding has become more frequent along the U.S. coastline. The rate is accelerating in many locations along the East and Gulf Coasts. Consistent with a lesser extent of sea level rise in the Pacific Ocean, the west coast of the U.S. is experiencing considerably less coastal flooding than the east coast.

The Greenland and Antarctic ice sheets are decreasing in mass. Greenland lost an average of 281 billion tons of ice per year between 1993 and 2016, while Antarctica lost about 119 billion tons during the same time period.

The amount of spring snow cover in the Northern Hemisphere has decreased over the past five decades, and the snow is melting earlier.

Particularly in the western U.S., heat waves are becoming more frequent.

The length of the typical fire season has increased by nearly 20 percent over the past 35 years, and the global area now impacted by long fire seasons has doubled.

The oceans are becoming more acidic, as they absorb increasing amounts of atmospheric carbon.

The above-noted indicators of climate change are expected to become more pronounced as global temperatures continue to rise, resulting in significant physical impacts on both the built and natural environment. Additionally, increasing global temperatures are expected to foment social and political instability, due primarily to competition over depleted resources and mass migration.

Extensive research has been conducted on the costs (and, in some cases, the benefits) of climate-related impacts. A 2017 study published in the Journal of Science estimates future climate-related costs and benefits for all counties in the continental U.S. These cost estimates account for the projected impacts of unmitigated climate change on crime, agriculture, energy, labor, coastal communities, and mortality. Overall, the U.S. is projected to experience significant costs: the study concludes that for every 1° F increase in global temperatures, the U.S. economy stands to lose about 0.7 percent of its Gross Domestic Product (GDP), with each degree of warming costing more than the last.

These impacts, along with strategies for adapting to a changing climate, are discussed in further detail in a subsequent section of the ECAE. The City of Oceanside is particularly vulnerable to sea level rise, more frequent and intense wildfires, and riverine flooding.

2.2.1 Factors Influencing Climate Change

The equilibrium temperature and climate of Earth is largely determined by the rate at which energy is received from the Sun and the rate at which solar energy leaves or is deflected away from the Earth's atmosphere. The distribution of the Sun's energy around the planet by winds, ocean currents, and other mechanisms determines the Earth's various climates.

Factors that shape climate are called **climate forcings**. There are a variety of climate change feedbacks that can either amplify or diminish the initial forcing. Some parts of the climate system, such as the oceans and ice caps, respond more slowly in reaction to climate forcings, while others respond more quickly. There are also key threshold factors which, when exceeded, can produce rapid change.

Climate forcings typically include changes in solar radiation, changes in the Earth's orbit, changes in the albedo (i.e., the reflectivity of the continents, atmosphere, and oceans), mountain-building and continental drift, and changes in GHG concentrations.

Forcing mechanisms can be either "internal" or "external". Internal forcing mechanisms are natural processes within the climate system itself. External forcing mechanisms can be either anthropogenic (e.g. increased emissions of GHGs and dust) or natural (e.g., changes in solar output, the earth's orbit, volcano eruptions).

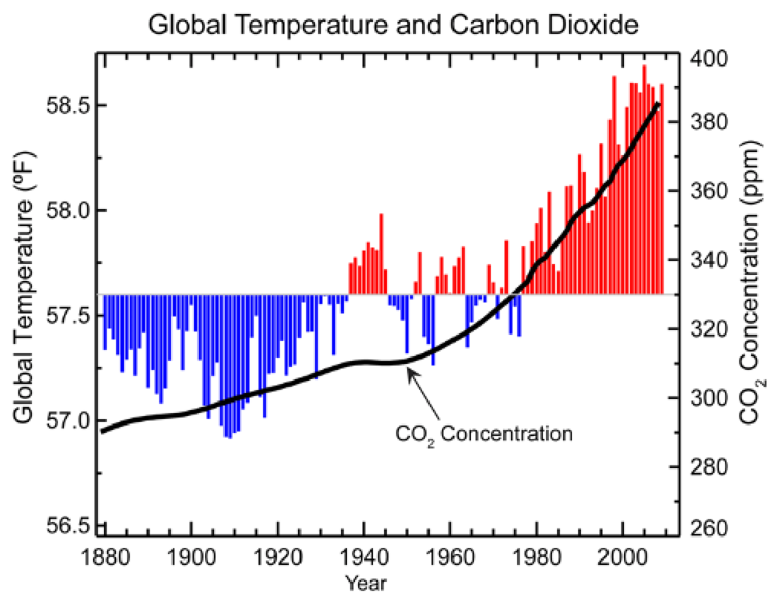
Whether the initial forcing mechanism is internal or external, the response of the climate system might be fast (e.g., a sudden cooling due to airborne volcanic ash reflecting sunlight), slow (e.g. thermal

Albedo is part of the energy from the sunlight that casts back into the atmosphere.

expansion of warming ocean water), or a combination (e.g., sudden loss of **albedo** in the Arctic Ocean as sea ice melts, followed by more gradual thermal expansion of the water). Therefore, the climate system can respond abruptly, but the full response to forcing mechanisms might not fully occur for centuries or even longer.

The most significant forcing mechanism associated with climate change is the growing concentration of carbon dioxide (CO_2) in the Earth's atmosphere. The average level of atmospheric CO_2 has increased by nearly 50 percent since the start of the Industrial Revolution, from 280 parts per million (ppm) during the 10,000 years up to the mid-18th century to 410 ppm as of mid-2018. Studies of Antarctic ice cores indicate that current atmospheric CO_2 levels are substantially higher than at any time in the last 800,000 years. Figure 3 illustrates how average annual global temperature has tracked with the concentration of CO_2 between 1880 and 2017.

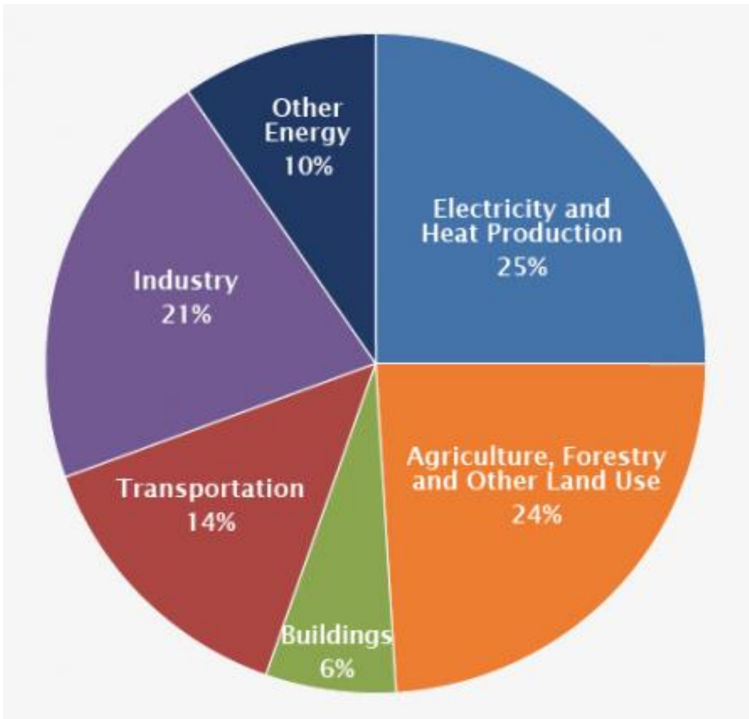
Figure 3: Correlation of Global Temperatures and Atmospheric CO_2 Levels



Source: National Climatic Data Center (NOAA)

Increasing levels of atmospheric and water-sequestered CO_2 and other GHGs are driven primarily by fossil fuel use, deforestation, intensive livestock farming, use of synthetic fertilizers, and industrial processes. The burning of petroleum, coal, natural gas, and peat for energy, transportation, and manufacturing currently produces more than two-thirds of all human-generated GHG emissions. Agriculture (including animal husbandry) and other land uses that displace forests and other natural areas are responsible for roughly a quarter of anthropogenic emissions. CO_2 makes up more than three-quarters of all GHG emissions, with methane (CH_4) accounting for roughly 16 percent and nitrous oxide (N_2O) accounting for roughly six percent. Fluorinated gases, used in industrial processes and refrigeration and released by some consumer products, make up roughly two percent of GHG emissions generated by human activities. Figure 4 depicts anthropogenic global GHG emissions by various sectors.

Figure 4: Global GHG Emissions by Sector



Source: EPA

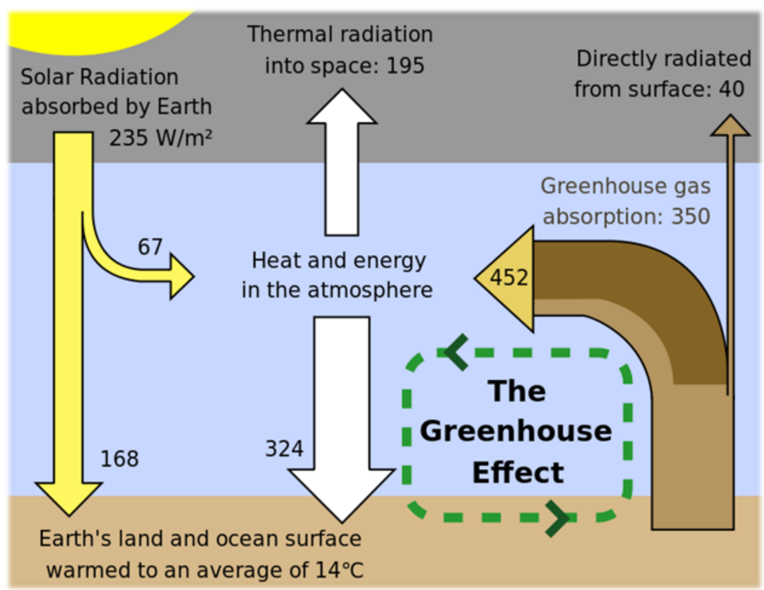
There are noteworthy differences between global GHG emissions and those generated within the U.S. For example, while transportation-related GHG emissions comprise only 14 percent of total emissions worldwide, GHG emissions from the transportation sector in the U.S. make up more than 25 percent of total U.S. emissions. This difference reflects not only the fact that incomes in the U.S. allow for widespread private vehicle ownership but also the fact that, relative to many other wealthy countries, the U.S. has a less robust public transportation system. This is partly due to sprawling land use patterns and long distance between population centers. Conversely, while agriculture and forestry-related emissions make up nearly a quarter of total global emissions, this sector generates less than ten percent of total U.S. emissions. This difference is largely because the U.S. is one of the world's most industrialized countries, but it may also reflect more advanced soil and forest management practices.

Soil management techniques can be employed to reduce GHG emissions from agricultural operations and, in some cases, sequester atmospheric CO_2 in the ground.

GHGs absorb and emit radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect – i.e., the trapping of solar radiation within the Earth's atmosphere. While the greenhouse effect is essential to the maintenance of life on Earth, it is also the principal mechanism behind global warming. The greenhouse effect plays an important role in regulating the Earth's so-called energy budget – i.e., the balance between the energy the Earth receives from the Sun and the energy the Earth radiates back into outer space. Solar energy that reaches the Earth is distributed throughout the five components of the climate system: water, ice, atmosphere, rocky crust, and all living things. Some of this solar energy is directed towards the Earth's surface, warming it. The intensity of the downward radiation – i.e., the strength of the greenhouse effect – will depend on the atmosphere's temperature and the amount of GHGs contained in the atmosphere. As the concentration of GHGs in the atmosphere increases, the greenhouse effect is intensified.

Figure 5 is a representation of the exchanges of energy between the Sun, Earth's surface and atmosphere, and outer space. The ability of the Earth's atmosphere to capture and recycle energy emitted by the Earth's surface is the defining characteristic of the greenhouse effect.

Figure 5: The Greenhouse Effect



Source: Robert A. Rohde, Global Warming Art Project

The existence of the greenhouse effect was first promulgated by Joseph Fourier in 1824. The argument and the evidence were further strengthened by Claude Pouillet in 1827 and 1838 and reasoned from experimental observations by John Tyndall in 1859, who measured the radiative properties of specific GHGs. The effect was more fully quantified by Svante Arrhenius in 1896, who made the first quantitative prediction of global warming due to a hypothetical doubling of atmospheric carbon dioxide. The term "greenhouse effect" was coined by Nils Gustaf Ekholm in 1901. It is, however, a misnomer, as the warming of greenhouses occurs by different mechanisms.

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CHAPTER 3

LOCAL SETTING

3.1 Local Setting

Effective climate action and other sustainability efforts must account for conditions on the ground, which inevitably differ per jurisdiction. Accordingly, the goals and policies of the ECAE have been developed with an understanding of the local setting in which they will be pursued and implemented. This local setting emerges through an assessment of:

1	Constraints that must either be overcome or accommodated;
2	Assets that can be leveraged;
3	Opportunities that can be exploited; and
4	Potential threats that could undermine the purpose and intent of the ECAE.

Like most local jurisdictions, Oceanside has limited fiscal resources to devote to GHG emission reduction and other sustainability efforts. The City also has limited authority and desire to require its residents and businesses to pursue sustainable practices through mandates. It is thus imperative that the City recognize what can and cannot be accomplished at the local level and what measures are likely to produce the best results at the lowest cost and with the highest amount of community support. In short, the City needs to pursue measures that are within its means and generally supported by the community. Identifying such measures requires a clear-eyed understanding of the context in which these measures will be implemented.

This chapter describes some of the key features of Oceanside and considers how these features support and/or complicate the City's sustainability efforts.

3.2 Overview

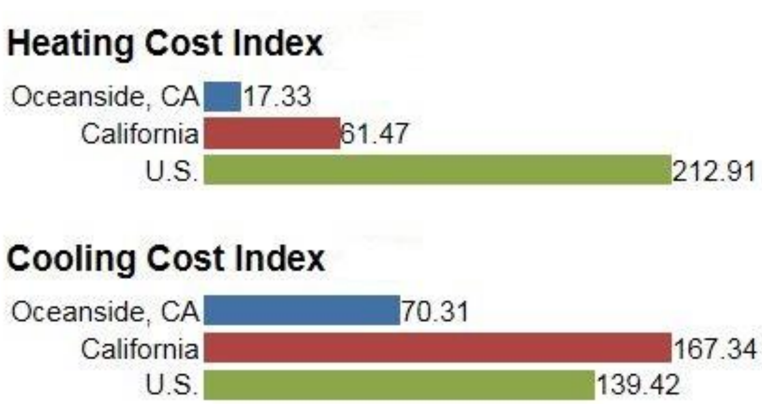
Over its 130-year history as an incorporated city, Oceanside has grown inland from the coast to encompass 42 square miles that reach as much as ten miles to the east. Most of this growth has taken the form of low-density residential neighborhoods and auto-oriented commercial strip centers. This sprawling growth has consumed most of the City's developable area and resulted in a relatively inefficient land use pattern that separates many residents from commercial areas, recreational amenities, schools, and transit service. Additionally, the City's many hills and mesas make walking and biking a challenge. Consequently, a large percentage of the City's residents and workforce rely on the private automobile as their most convenient and cost-effective means of transportation.

Located on the periphery of the San Diego metropolitan area and bordered by open space and rural lands to the north and east, Oceanside depends on regional roadways to connect its residents, workers, and visitors to job centers, shopping and entertainment venues, and other destinations in the region. These roadways experience regular congestion, which can significantly increase travel time and vehicle emissions.

3.3 Climate

Oceanside benefits from one of the world's best climates, due largely to its latitude and proximity to the ocean. With a mean summer high temperature of roughly 82° F and a mean winter low temperature of roughly 55° F, the City generally does not experience extreme temperatures that require a great deal of energy-consuming climate control for homes and businesses. Figure 6 shows that the City's heating and cooling costs are well below the state and national averages.

Figure 6: Oceanside Ranking in State and National Heating and Cooling Cost Indices



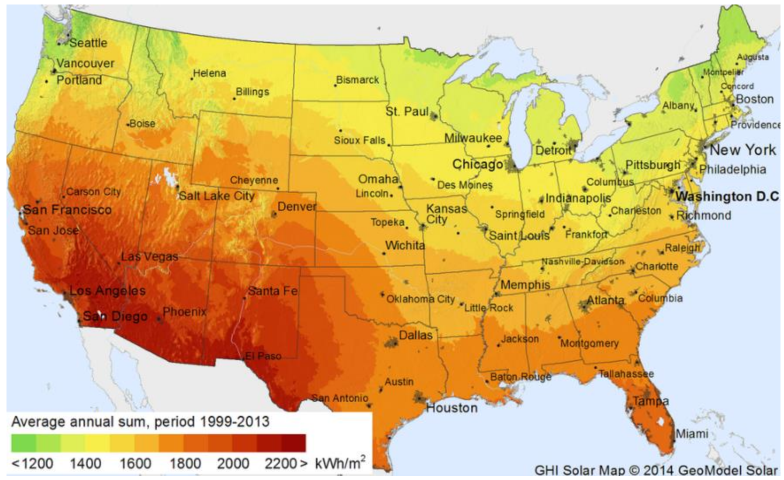
Source: USA.COM

The heating and cooling cost indices are indicators of the relative heating and cooling cost of an area. They are calculated based on average temperature and the duration of hot and cold days for the area. Actual heating and cooling costs are also dependent on the size of buildings, insulation quality, equipment efficiency, etc.

Peak sun-hours are the hours when sunlight provides at least 1,000 watts of photovoltaic power per square meter.

On average, there are approximately 266 days of sunshine in Oceanside, which is 33 percent above the national average. As illustrated in Figure 7, the City receives more peak sun-hours than the national average.

Figure 7: Global Horizontal Irradiation (United States)



Consequently, Oceanside is an excellent environment for solar photovoltaic (PV) facilities. Between January 2015 and August 2018, the City issued approximately 3,833 permits for residential solar PV installations and 59 permits for commercial and industrial solar PV projects. Oceanside homeowners and businesses who install solar PV can enter into a net energy metering (NEM) agreement with San Diego Gas & Electric (SDG&E) that provides bill credit for surplus energy placed into the power grid. While the NEM program does not pay customers for the solar power they contribute to the power grid, it does allow many customers to "zero-out" their electric bills.

3.4 Water Supply

Oceanside has significantly increased its harvesting of local potable water in recent years (primarily through groundwater extraction in the San Luis Rey River aquifer) and is in the process of implementing an ambitious recycled water program. Nevertheless, the City still relies heavily on imported water. Supplied by the San Diego County Water Authority (SDCWA), this imported water comes primarily from the Colorado River, with a smaller portion (less than 20%) coming from the Sacramento-San Joaquin Delta.

The extraction, treatment, and delivery of imported water is an energy-intensive enterprise. According to a 2005 study by the California Energy Commission (CEC), water-related energy use in California consumes roughly 20 percent of the state's electricity, 30 percent of its natural gas, and nearly 90 billion gallons of diesel fuel each year.

In 2015, an executive order from Governor Jerry Brown established mandatory water conservation standards for California water suppliers. The City's Water Utilities Department is responsible for achieving a 20 percent reduction in water consumption by 2020. Strategies for meeting this state requirement are outlined in the City's Water Conservation Master Plan.

3.5 Income Considerations

While Oceanside is a socioeconomically diverse community, roughly 40 percent of the City's households qualify as lower-income. Consequently, many of these households don't have the financial resources to invest in significant energy efficiency or renewable energy improvements. These households are also unable to afford many low and zero-emission automobiles. While lower-income residents are more likely to utilize public transit, this is often not a viable or convenient option in parts of the City with limited transit services.

SDG&E's Energy Savings Assistance Program provides free energy efficiency upgrades for households that qualify based on income and household size or participation in certain public assistance programs. Upgrades include attic insulation, energy-efficient lighting, door weather-stripping, appliances replacement, caulking, low-flow plumbing fixtures, and water heater blankets. SDG&E and the City of Oceanside have partnered to offer customers free water and energy savings kits that provide tools for improving water and energy efficiency in the home. The kits include a hand-held, low-flow showerhead, three faucet aerators, and an LED sensor night light.

Through an additional partnership with SDG&E, the San Diego County Water Authority (SDCWA) and the City of Oceanside are reaching out to disadvantaged communities within their service areas to provide expanded energy and water use efficiency opportunities for low-income residents. Working through SDG&E's Energy Savings Assistance Program, qualified Oceanside residents will receive assistance for devices such as low-flow showerheads and efficient washing machines. Work is currently underway to reach out to small and mid-sized commercial kitchens as well as agricultural customers throughout San Diego County to provide incentives and financing opportunities that will provide quantifiable water and energy savings.

For residents living in apartment buildings or other attached housing developments with common parking areas, there is often little or no access to EV charging facilities. Under SDG&E's Power Your Drive program, many attached housing developments located in disadvantaged communities are eligible for subsidies for the installation and maintenance of EV charging stations. As of June 2018, some areas of the City adjacent to I-5 and north of Oceanside Boulevard qualified as disadvantaged communities under criteria established by the California Office of Environmental Health Hazard Assessment.

The North County Transit District (NCTD) offers reduced train and bus fares to seniors, persons with disabilities, Medicare recipients, and (to a limited extent) personal care attendants. NCTD also offers a demand-based paratransit service (LIFT) for disabled persons.

3.6 Transportation

The City is home to one of the most important transit hubs in southern California – the Oceanside Transit Center (OTC). The OTC accommodates four separate rail services (Amtrak, NCTD Coaster, NCTD Sprinter, and Metrolink) as well as bus service that not only links riders to destinations within Oceanside but also connects them to Vista, Camp Pendleton, and the other North County coastal cities. However, transit ridership accounts for only a small percentage of total daily trips in Oceanside.

NCTD's Sprinter rail service extends through the Oceanside Boulevard corridor and into the cities of Vista, San Marcos, and Escondido. There are seven Sprinter stations in Oceanside, all of which are designated as Smart Growth Opportunities Areas (SGOAs) on SANDAG's Regional Smart Growth Concept Map. The potential of each of these SGOAs to accommodate transit-oriented development varies, based on the nature and extent of existing development, topographic features, natural habitat, and other considerations.

The City is linked to points north and south by I-5 and east by SR-76 and SR-78. These regional roadways allow for daily commuting between Oceanside and other jurisdictions throughout San Diego County, south Orange County, and southwestern Riverside County. There are long-term plans to expand capacity on both SR-78 and I-5, with high occupancy vehicles (HOV) lanes being added to both roadways.

Funded by the regional TranNet sales tax, the North Coast Corridor project involves highway, rail, environmental, and coastal access improvements within the I-5 corridor. These improvements should promote increased transit use and ride sharing, thereby reducing VMT and associated GHG emissions.

The City's local street network features four major commercial corridors: Coast Highway, Mission Avenue, Oceanside Boulevard, and Vista Way. To varying degrees, these commercial corridors are served by NCTD's Breeze bus service. The most robust bus service occurs along Mission Avenue, where approximately 15-minute headways link the OTC to the Vista Transit Center. Other local roadways served by the NCTD Breeze are College Boulevard, El Camino Real, and Rancho del Oro Road.

With the San Luis Rey River Trail and the Coastal Rail Trail, Oceanside boasts some of the best bicycle facilities in the San Diego region. As funding and jurisdictional issues are resolved, the Inland Rail Trail will be extended through Oceanside within the Oceanside Boulevard

Corridor. The City's Pedestrian and Bicycle Master Plans identify "priority projects" that extend and fill gaps in Oceanside's active transportation network. Most of these projects will be implemented in conjunction with private development, though some will be carried out through the City's capital improvement program.

3.7 Housing

As of 2018, Oceanside was home to over 175,000 residents living in roughly 65,000 housing units. Many of these housing units were constructed 30 or more years ago and do not comply with current state building standards regarding energy efficiency. Consequently, the potential exists for enormous energy savings in much of the City's existing housing stock. Moreover, there remain many opportunities for rooftop solar PV installations in the residential sector.

However, with more than 40 percent of the City's existing housing stock being renter-occupied, many Oceanside residents are not at liberty to make substantial improvements to their homes. It is not reasonable to expect renters to invest in energy efficient upgrades or solar power generation when they would not see much, if any, financial return on these investments. Thus, it largely falls to income property owners and property management entities to make these investments.

3.8 Employment

While Oceanside has grown its employment base in recent years, with the development of several business parks, a burgeoning hospitality sector, and an increasing number of home-based businesses, the City's jobs-to-housing ratio remains among the lowest in the San Diego region. Consequently, a large percentage (roughly 80%) of Oceanside residents in the workforce commute to jobs located outside of the City. Although most other cities in the San Diego region also see a majority of their employed residents commuting out of their jurisdictions for work (regardless of their jobs-to-housing ratios), many Oceanside residents have among the longest commutes in the region.

The Economic Development Element (EDE), prepared in conjunction with the ECAE, promotes expansion of the City's employment base through a wide range of policies that call for:

- Recruitment of businesses in emerging employment sectors (e.g., biotech, cleantech, information and communication technologies, precision manufacturing);
- Expansion of visitor-serving uses;
- Efficient use of commercial and industrial land;

- Allowances for low-impact industrial uses in commercial zones;
- Synergies between residential and neighborhood-serving commercial uses; and
- More local retail options for residents

3.9 Agriculture

Oceanside is somewhat unique among Southern California coastal cities in having a significant percentage of its land area designated for agricultural use. The South Morro Hills area in the northeast corner of the City comprises more than 3,200 acres of farmland that produces a wide range of agricultural products. The South Morro Hills area provides opportunities for local food sourcing, carbon farming, and local employment through agritourism and expanded agricultural operations.

3.10 Coastal Location

The City's three miles of coastline on the Pacific Ocean not only make it an attractive place to live and a popular visitor destination but also a potential beneficiary of renewable wave and tidal energy sources. While local conditions are not ideal for existing technologies, as the City' coastline does not experience extreme tidal flux or exceptional wave power, opportunities may emerge as technologies evolve and become more efficient and less expensive.

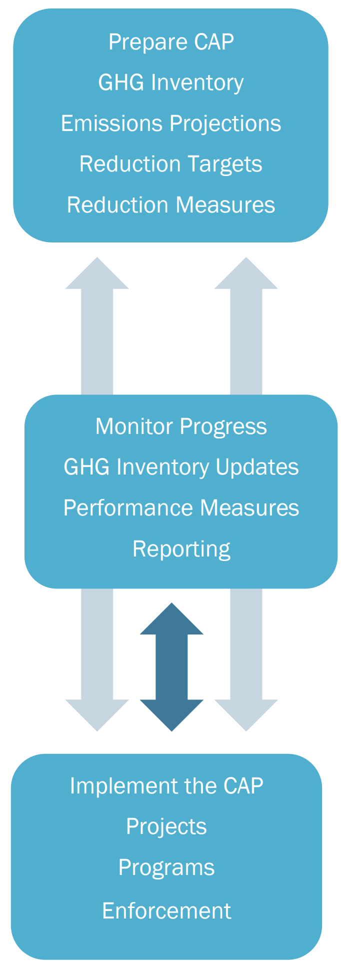
3.11 Sustainability in a Suburban/Exurban Environment

In summary, while Oceanside benefits from an ideal climate that eases energy demand and provides ample sunshine for solar PV facilities, the City's dispersed land use patterns, peripheral location within the San Diego region, and relatively low jobs-to-housing ratio create challenges for VMT reduction and other sustainability efforts. In light of this dynamic, the goals and policies of the ECAE, as well as the GHG emissions reduction measures of the CAP, focus on sourcing renewable power, reducing energy and water use in the City's existing building stock, reducing solid waste, expanding low emission vehicle (LEV) and zero emission vehicle (ZEV) ownership, and ensuring that future development promotes walkability, transit use, and urban forestry.

3.12 Climate Action Plan (CAP)

In accordance with CEQA, the City's decision to initiate a General Plan Update (GPU) has prompted the need to prepare and implement a CAP. State law requires that local jurisdictions address the impacts of GHG emissions associated with projects subject to CEQA, including GPUs. It is now standard practice among California cities and counties to meet this requirement through a CAP, which outlines a variety of measures designed to mitigate the anticipated GHG emissions impacts of future development and reduce local GHG emissions in accordance with state goals. Such measures typically address energy efficiency, renewable energy, low and zero-emission transportation options, water conservation, solid waste management, and urban forestry.

FIGURE 8: TYPICAL CAP PROCESS



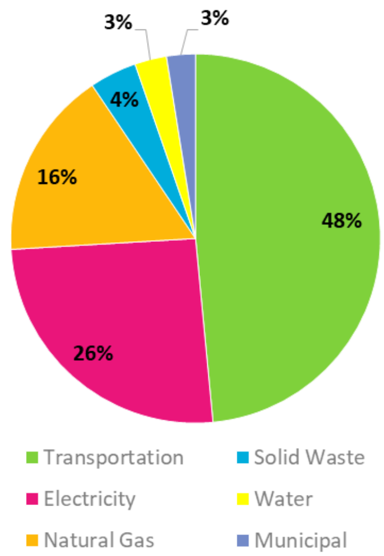
The preparation of a CAP initiates the cyclical process illustrated in Figure 8, above. Once the CAP has been adopted, the City will need to prepare a number of ordinances and initiate a number of programs to effectively implement the CAP's GHG emissions reduction measures. It is assumed that no additional staffing will be available to implement these measures. Current staff in several City disciplines will have to assume responsibility for bringing these measures to fruition. This will likely necessitate a reevaluation of priorities and timelines for the completion of other assigned tasks. With support from SANDAG and the Environmental Policy Initiatives Center (EPIC), staff has conducted an assessment of the staff resources needed to implement the CAP.

It is anticipated that the CAP will be updated every four to five years, in conjunction with an updated GHG emissions inventory that will indicate how citywide GHG emissions are trending. Based on the results of the updated GHG emissions inventory, emissions reduction measures can be modified to ensure that the City remains on track to reach its emissions reduction targets.

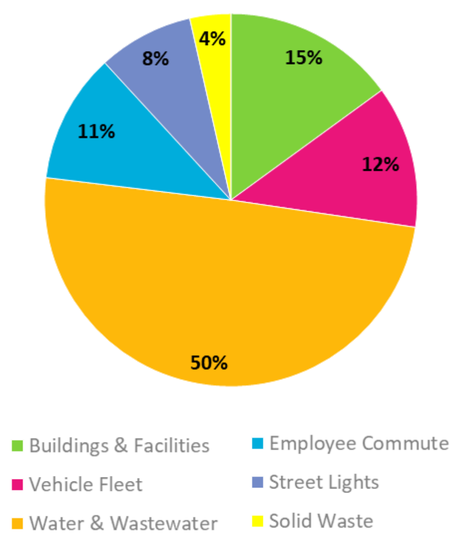
The GHG emissions reduction measures in the CAP are listed in Appendix A.1. These measures emphasize public awareness and education, recognizing that significantly reducing the City's carbon footprint will require individual households and businesses to make conscious decisions to conserve energy and water, generate less waste, embrace alternative transportation, and, to the extent feasible, source electrical power from renewable, emissions-free sources. There are few mandates among the proposed GHG reduction measures; the vast majority of the measures promote voluntary action by residents and business owners. This voluntary action will not only cut GHG emissions but also reduce costs, enhance quality of life, promote emerging industries, and preserve open space and other valued natural resources.

FIGURE 9: GHG EMISSIONS

COMMUNITY GHG EMISSIONS (2013)



MUNICIPAL GHG EMISSIONS (2013)



In addition to GHG emissions reduction measures, the CAP includes a CEQA consistency checklist designed to streamline the process by which future development projects demonstrate consistency with the City's GHG emissions reduction targets. In most cases, the consistency checklist will eliminate the need to conduct project-specific GHG emissions impact analysis as part of the CEQA process, thereby saving project applicants time and money.

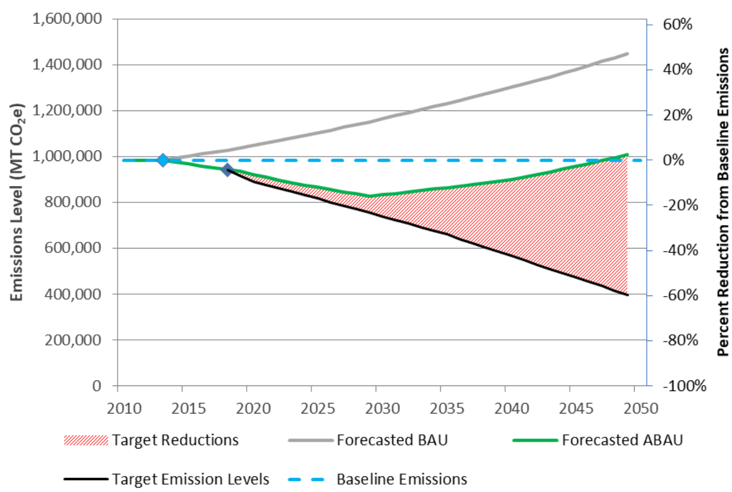
An inventory of citywide GHG emissions in 2013 provides the baseline for emissions forecasting and target-setting. While state emissions reduction targets are pegged to 1990 emissions levels, 2013 is the earlier year for which reliable. The attached summary begins with two pie charts that reveal the various sources of local GHG emissions, as determined by the 2013 emissions inventory. As indicated in the first pie chart, roughly half of local GHG emissions are generated in the transportation sector, primarily by private automobile travel. Energy consumption in buildings (both electricity and natural gas) accounts for roughly 42% of total GHG emissions. Other identified emissions sources include off-gassing from solid waste, the transport of water, and various municipal operations. The 2013 emissions inventory does not identify emissions from agriculture, marine operations, or other sources. Future inventories may acknowledge these and other sources of GHG emissions.

Line graphs in the following CAP summary show estimated future GHG emissions under different scenarios: "business-as-usual," "adjusted business-as-usual," and "target emission levels." Other line graphs in the summary show how these different emissions scenarios relate to the City's emissions reduction targets, which are expressed in terms of both mass emissions and per-capita emissions. In keeping with state emissions reduction targets, the CAP seeks to reduce per-capita emissions to 4.0 MT CO_2^e per "service population" – i.e., residents plus people who commute to jobs in the City.

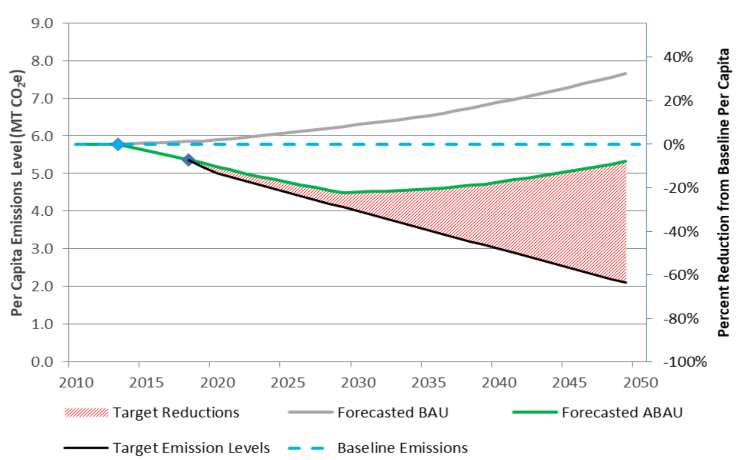
As the last line graph illustrates, the City can demonstrate consistency with state emissions reduction targets through 2035, which is the planning horizon for the EDE/ECAE. Forecasted emissions begin to diverge from target emission levels soon thereafter. Thus, in order to maintain alignment with state targets between 2035 and 2050, the City will need to implement additional emissions reduction measures as new technologies and other opportunities emerge.

FIGURE 10: COMMUNITY EMISSIONS INVENTORY

COMMUNITY EMISSIONS INVENTORY, FORECAST, AND TARGETS (2013-2050) [1]



COMMUNITY EMISSIONS INVENTORY, FORECAST, AND TARGETS (2013-2050)[1]



[1] "Forecasted BAU" refers to future emissions without federal and state emissions reduction measures, while "Forecasted ABAU" refers to future emissions with federal and state emissions reductions measures. The City is able to take credit for federal and state emissions reduction measures in its forecasting of future local emissions. "Target Reductions" refer to emissions reductions consistent with state goals. "Baseline Emissions" are those calculated in the 2013 GHG Emissions Inventory.

3.13 CAP GHG Reduction Measures

ENERGY USE IN BUILDINGS/FACILITIES

Renewable Energy Procurement (~74,000 MT CO_2^e)

- 75% renewable electrical power by 2030
- City Initiative: Partnership with SDG&E; possible Community Choice Aggregation (CCA)

Solar PV Promotion (~19,000 MT CO_2^e)

- Mandate: 50% renewable power in new development (50 or more parking spaces)
- Incentives:
  - PV financing (e.g., PACE)
  - Permit streamlining, fee waiver
  - Aggregated demand program (in partnership with local vendors)
- City Initiative: Promotion through Green Oceanside

Residential & Non-Residential Energy Use Disclosure/Benchmarking (Not Quantified)

- EPA Energy Star Portfolio Manager
- City Initiative: Promotion through Green Oceanside
- Incentives: TDB

Low-Income Financing Options (Not Quantified)

- Incentives: TDB
- City Initiative: Promotion through Green Oceanside

WATER USE

Water Master Plan (~1,600 MT)

- Incentives:
  - Usage Surveys and Audits
  - Residential, Commercial, and Large Landscape Audits
  - Rebates, Incentives, Educational Workshops
- City Initiative: Public Information Campaigns
- Mandate: Water Efficiency Landscape Ordinance
- Non-residential Water Consumption Benchmarking (Not Quantified)
- Expansion of Local Water Supply (~5,600 MT)

Help Make Water Conservation a California Way of Life

- Mandates:
  - Inside water use targets and standards
  - Outside water use targets and standards
  - General performance measures and goals for commercial industrial
  - Water loss standards expressed in terms of volume per capita, per connection, per cost, and age of infrastructure

SOLID WASTE

Zero Waste Strategic Resource Plan (~10,300 MT)

Enhanced Waste Diversion Post-2020 (~16,500 MT)

LAND USE/TRANSPORTATION

Smart Growth Policies (~2,500 MT)
• City Initiatives:
  • Zoning standards that facilitate transit-oriented development
  • Capital improvements that promote infill/redevelopment
  • Program EIRs that streamline CEQA review for infill/redevelopment
  • Pursuit of federal, state, and regional grant funding
	Electric Vehicle (EV) Charging Facilities (~5,000MT)
	• Mandates:
	  • Increased EV pre-wiring in all new residential development
	  • Increased EV pre-wiring in all new non-residential development
	• Incentives:
	  • Permit fee waiver for EV charging stations
	  • Educate residents about LEV/ZEV options
	  • Allow ZEV sales by-right in all commercial zones
	  • Establish public-private partnerships to encourage EV charging stations in existing retail, office, and industrial facilities
	  • Preferential parking spaces for ZEVs (up to 12% of total)
	  • Aggregated demand program (in partnership with local vendors)

Complete Streets (Not Quantified)
• City Initiatives:
  • Identify additional priority projects in the City's Bike and Pedestrian Master Plans
  • Establish complete streets criteria for CIP projects
  • Collaboration with local school districts to promote active transportation to and from school sites, as well as school site housing
  • Collaboration with NCTD to explore neighborhood electric vehicle (NEV) plans, including a coastal zone circulator and a business park loop shuttle
	Transportation Demand Management (TDM) Plans/Programs (~4,200MT)
	• Mandate: Adopt a TDM ordinance that requires new non-residential developments and expansions of existing non-residential developments generating more than 100 daily vehicle trips to prepare a TDM plan
	• Mandate: Require businesses to complete a TDM survey at the time of business license renewal

Signal optimization, roundabouts, and other traffic efficiency measures (Not Quantified)	

AGRICULTURE AND URBAN FORESTRY

Urban Forestry Plan (~800MT)	• City Initiatives:
	  • Urban forestry plan, including a commitment to plant at least 200 trees in public spaces annually
	  • Establish a green streets checklist for CIP projects
	  • Include urban forestry in the Green Oceanside educational outreach program as a means of encouraging residents and business owners to expand tree canopy both on their private property and within adjacent parkways in the public right-of-way
	  • Establish public-private partnerships that support volunteer tree planting and stewardship efforts
	• Mandate: Adopt a green streets ordinance or similar means of requiring that new development projects incorporate shade trees
	• Incentive: Allow projects to mitigate GHG emissions impacts with off-site canopy tree installations and stewardship plans

Urban Agriculture and Community Gardens (Not Quantified)	• City Initiatives:
	  • Establish a population ratio and/or proximity standard for community gardens
	  • Identify feasible urban agriculture and community garden sites on both public land and underutilized private properties and inform private property owners of urban agriculture and community garden opportunities
	  • Adopt a community garden program
	• Incentives:
	  • Amend zoning standards to better accommodate urban agriculture and community gardens
	  • Adopt an Urban Agriculture Incentive Zone (UAIZ)
	• City Initiative: Include urban agriculture and community gardening in the Green Oceanside educational outreach program

Agricultural Lands Conservation Program (13,000MT)	• City Initiative: Collaborate with landowners to prepare agricultural easement grant applications and pursue minimum matching funds for agricultural preservation easements from internal or external sources.
Carbon Farming Program (Not Quantified)	• City Initiative: Collaborate with agriculture landowners to establish up to 50 acres of demonstration carbon farming operations

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CHAPTER 4

REGULATORY SETTING

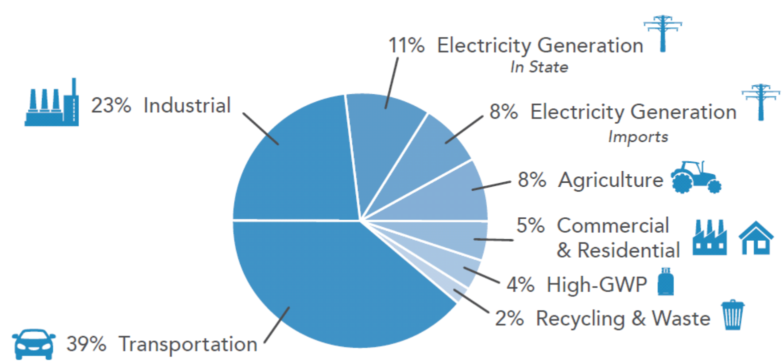
4.1 Regulatory Setting

Due to the current uncertainty over federal standards and funding opportunities, the City's climate action efforts are largely motivated and guided by California's ambitious GHG emissions reduction targets and broad-based approach to calculating, monitoring, and reducing the state's carbon footprint. California's strategy for reducing GHG emissions is shaped by legislation, regulations, and executive orders. Executive orders, laws, and regulations are listed on the state's Climate Change Portal.

4.1.1 Statewide GHG Emissions

The effort to reduce GHG emissions begins with identification of emissions sources and assessment of current emissions levels. The California Air Resources Board (CARB) is responsible for calculating the state's GHG emissions and monitoring emissions trends. Figure 11 shows estimated statewide emissions by source for 2015.

Figure 11: Statewide GHG Emissions Sources (2025)



Source: 2017 Scoping Plan (CARB)

Total estimated statewide GHG emissions in 2015 amounted to approximately 440.4 $MMTCO_2{}^e$, with transportation and industry accounting for more than 60 percent of total emissions in California. Electricity generation contributed nearly 20 percent of the state's total emissions in 2015, with many electrical power plants fueled by natural gas.

High-GWP refers to GHGs with high global warming potential, which include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). HFCs are found in solvents, residential and commercial refrigerants, firefighting agents, and propellants for aerosols. HFC emissions have increased steadily since 1990, largely because HFCs replace chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and other ozone-depleting substances being phased out under the terms of the 1989 Montreal Protocol. PFCs are primarily generated through the production of aluminum and semiconductors. SF_6 is used primarily as an insulator in electrical applications.

It is important to note that the distribution of GHG emissions at the local level can vary significantly, based on a jurisdiction's location, land use, transit access, and weather. Thus, the distribution of GHG emissions at the local level can look very different than the statewide distribution illustrated in Figure 11. For instance, Oceanside does not have much heavy industry, nor a significant amount of intensive farming or animal husbandry. Conversely, due in part to Oceanside's peripheral location in the San Diego metropolitan, transportation-related emissions in the City are significantly higher than the statewide percentage.

4.1.2 California's Emissions Reduction Targets

Executive Order S-3-05, issued by Governor Schwarzenegger in June 2005, calls for state agencies to work toward reducing GHG emissions as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. Since then, the legislature has codified the 2020 target (in AB 32) and a midterm 2030 target (in SB 32) for statewide emissions reductions.

In 2006, Governor Schwarzenegger signed into law Assembly Bill 32, the Global Warming Solutions Act, which codifies the 2020 GHG emissions target in Executive Order S-3-05 and calls for California to reduce GHG emissions to 1990 levels by 2020. In 2016, Governor Brown signed into law Senate Bill 32, the California Global Warming Solutions Act, which establishes a GHG reduction target of 40 percent below 1990 levels by 2030. The targets are supported by scoping plans that outline a broad range of emissions reduction strategies. The most recent scoping plan, issued in 2017, establishes the following per-capita emissions targets:

- 6.0 $MTCO_2^e$/service population for 2020
- 4.0 $MTCO2^e$/service population for 2030
- 2.0 $MTCO2^e$/service population for 2050

The City of Oceanside has chosen to utilize these per-capita emissions targets in its CAP, with modifications that reflect the range and prevalence of GHG emissions sources in the City.

CALIFORNIA AIR RESOURCES BOARD

CARB is tasked with developing the state's emissions reduction strategies.

Service population refers to both the residents and non-resident workforce of a jurisdiction.

Based on tracking done by the CARB, California is on track to meet the 2020 emissions target. However, attaining the 2030 target will require accelerated emissions reduction.

4.1.3 State-Level Emissions Reduction Strategies

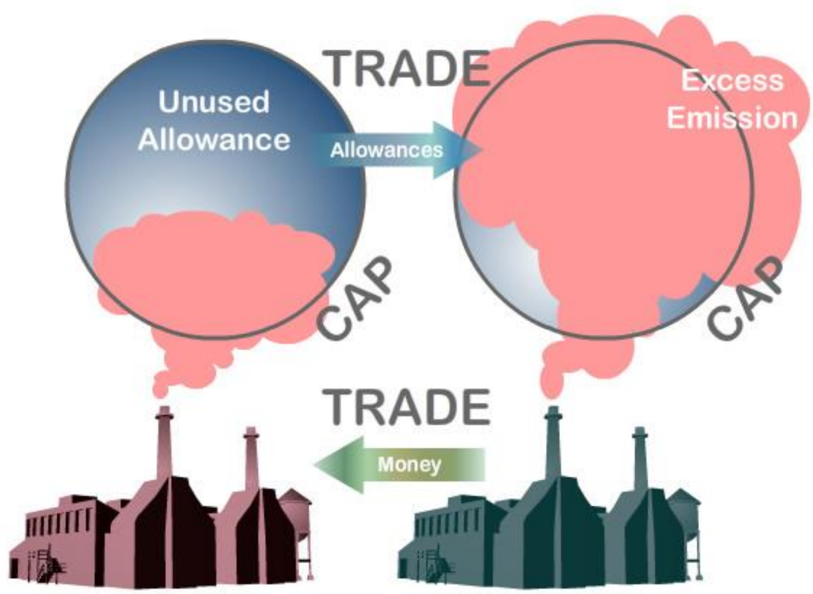
The key state-level GHG emissions reduction measures outlined in the 2017 Scoping Plan include the following:

- 50 percent renewable electrical power by 2030
- Doubling of energy efficiency in natural gas and electricity end uses
- At least 18 percent reduction in vehicle fuel carbon intensity by 2030
- 1.5 million zero-emission vehicles (ZEVs) by 2025; 4.2 million ZEVs by 2030
- Enhanced emissions reduction standards for medium and heavy-duty vehicles
- Enhanced fuel economy standards for all light-duty vehicles beyond 2025
- Transition to clean transit options (100 percent zero-emission technology by 2030, new natural gas and diesel buses encouraged to meet optional heavy-duty low-oxides of nitrogen (NOx) standards)
- Increasing numbers of zero-emission Class 3-7 last-mile delivery trucks
- At least five million metric tons of carbon dioxide sequestered within the state's forest resources
- Policy asserting that protection and management of natural and working lands is an important strategy in meeting the state's GHG reduction goals
- 25 percent greater efficiency in the freight system with deployment of over 100,000 freight vehicles and equipment capable of zero-emission operation by 2030
- Reduction in VMT through continued implementation of Senate Bill 375, the Sustainable Communities and Climate Protection Act, which requires regional planning agencies to prepare Sustainable Communities Strategies
- 40 percent reduction in methane and hydrofluorocarbon emissions below 2013 levels by 2030 and 50 percent reduction in black carbon emissions below 2013 levels by 2030

These measures are accompanied by California's cap-and-trade program, a market-based approach to GHG emissions reduction that monetizes carbon emissions and allows for the sale of credits between GHG emitters and entities that achieve emissions reduction by various means. The 2017 Scoping Plan calls for an extended and more stringent cap-and-trade program, which applies to all large industrial GHG emitters, imported electricity, and fuel and natural gas suppliers.

Under cap-and-trade, the state first sets a total statewide emissions limit (cap) that supports California's emissions reduction targets. The cap is then divided into allowances (usually one allowance equals one metric ton) and distributed (or auctioned) to GHG emitters. The emitters can comply with cap-and-trade in several ways: they can reduce emissions to accord with their allowances; they can cut emissions below their allowances and sell the extra allowances to emitters who need more; they can emit more than they are allowed and buy extra allowances; or they can buy "offsets" – i.e., emissions reductions from sources not covered by the cap and trade program. Cap-and-trade allows market forces to produce the cheapest emissions reduction, rather than having governments decide how and where reductions will occur. Figure 12 illustrates the basic concept behind the state's cap-and-trade program.

Figure 12: GHG Emissions Cap-and-Trade Program



Source: Legal Planet

Akin to the state's cap-and-trade program, local jurisdictions can allow new development projects to wholly or partially offset their emissions through the purchase of mitigation credits or the implementation of off-site emissions-reduction projects. Revenue from the sale of mitigation credits can support a wide range of local emissions-reduction efforts – e.g., subsidy of energy efficiency upgrades, rooftop solar PV, or EVs for lower-income households, transit passes, expansion of active transportation infrastructure, expansion of recycled water facilities. etc. While the City's initial CAP does not include a local emissions offset program, such a program could be incorporated as part of the CAP consistency checklist in the future.

California's renewable energy activities have targeted both small-scale, distributed generation as well as larger, utility-scale renewable generation. Expansion of small-scale distributed generation, including rooftop PV, fuel cells, gas turbines, and advanced energy storage, has been driven primarily by incentive programs. Programs include California Solar Initiative, New Solar Homes Partnership, Self-Generation Incentive Program, Net Energy Metering, and federal tax credits. Governor Brown set a goal for 12,000 megawatts (MW) of distributed renewable generation by 2020; as of November 2017, 10,520MW of distributed renewable generation capacity was operating or installed.

With respect to water conservation, the state's overall goal is to promote efficient use of water and use cleaner energy sources to move and treat water. The 2017 Scoping Plan recognizes that water conservation is critical to making the state's water supply more reliable and drought-resistant, and encourages efficient use and reuse to meet future water demands while adapting to climate change impacts. California's 2009 Water Conservation Act (Senate Bill X7-7) set a goal to reduce per capita water use by 20 percent by 2020; Executive Order B-37-16 calls for new water-use targets to increase water conservation statewide. Senate Bill 555 (Wolk, 2015) sets performance standards for water loss and minimizes water system leaks. The State also has set goals for increasing recycled water and stormwater usage, which have been supported by over $1.15 billion in infrastructure grant and loan programs. Additional investments from the state have supported regional collaborative efforts to develop water-management plans, diversify regional water portfolios, and increase self-reliance. The State also recognizes that efforts to conserve water are critical for both reducing GHG emissions and building resilience to impacts of climate change, such as high temperatures and severe drought. Per Senate Bill 1425, the GHG emissions that result from the transport and use of water will be tracked and registered by CalEPA.

4.1.4 State Guidance for Local Jurisdictions

Per the goals of the 2017 Scoping Plan, by 2035 the state will need 50 percent of new cars sales to be ZEVs, 50 percent of transportation fuels to come from renewable sources, and a 7.5 percent reduction in VMT through SB 375 and other state strategies. While anticipated VMT-related emissions reduction is less than that anticipated from advances in technology and fuels, VMT reduction is necessary for GHG reductions in other sectors. Moreover, VMT reduction is expected to have important co-benefits, including improved public health.

The Scoping Plan recognizes that VMT reduction supports other important public health, equity, economic, and conservation goals. Strategies for VMT reduction influence the location and type of future new development, which in turn influences pollutant exposure, accessibility to jobs and services, transportation options, energy consumption, water infrastructure demand and costs, preservation of natural and working lands, food security, watershed health, and ecosystem balance.

More ambitious SB 375 GHG reduction targets will enable the state to make significant progress toward its emissions reduction goals, but these targets alone will not provide all of the emission reductions needed. Bridging the gap will require new state and local VMT-reduction measures. Such measures could include incentives for infill development, performance measures for transportation facilities, expansion of shared-mobility options, and pricing policies.

State policies, regulations, and strategies do not place any emissions reduction requirements on local jurisdictions, but local efforts to curb GHG emissions are critical to achieving the state's emissions reduction targets. CARB thus recommends that local jurisdictions leverage local land use authority to encourage sustainable development, invest in capital improvements that promote transit use and active transportation, and set an example for the local community by reducing emissions from municipal operations.

CARB advises local jurisdictions to prepare emissions reduction plans that accord with the U.S. Community Protocol for Accounting and Reporting of GHGs, developed by Local Governments for Sustainability (ICLEI). CARB further recommends that local jurisdictions quantify emissions and emissions reduction through ClearPath California, a tool prepared and maintained by ICLEI in coordination with various state agencies. The City of Oceanside has utilized ClearPath California to prepare its baseline GHG emissions inventory and future emissions forecasts.

The Scoping Plan notes that in addition to preparing CAPs and pursuing other emissions reduction projects and programs, local jurisdictions can also support statewide climate action through the development review process. In an effort to achieve no net increase in GHG emissions, the Scoping Plan encourages local jurisdictions to promote efficient development patterns and require development projects to incorporate design features that minimize their carbon footprints. At the same time, recognizing that not all projects can achieve net zero GHG emissions, the Scoping Plan urges local jurisdictions to establish evidence-based numeric thresholds to assess the significance of GHG emissions impacts associated with new development.

4.1.5 The California Environmental Quality Act (CEQA)

CEQA provides explicit direction to local jurisdictions regarding the assessment and mitigation of GHG emissions impacts associated with new development and long-range planning projects.

CEQA Guidelines Section 15130(b)(1)(B) establishes that assessment of cumulative GHG emissions impacts include “a summary of projections contained…in a planning document that describes or evaluates conditions contributing to the cumulative effect.” This section goes on to state that “such plans may include a general plan, a regional transportation plan, or plans for the reduction of GHGs.” This language provides the legal basis for local and regional climate action plans, which are often employed to mitigate the projected GHG emissions impacts associated with GPUs and other long-range planning efforts. CEQA Guidelines Section 15183.5 establishes that “lead agencies may analyze and mitigate the significant effects of GHG emissions at a programmatic level, such as in…a plan to reduce GHGs [and] later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review.” This language enables local jurisdictions to utilize their CAPs as a means of streamlining the review of GHG emissions impacts associated with proposed development projects.

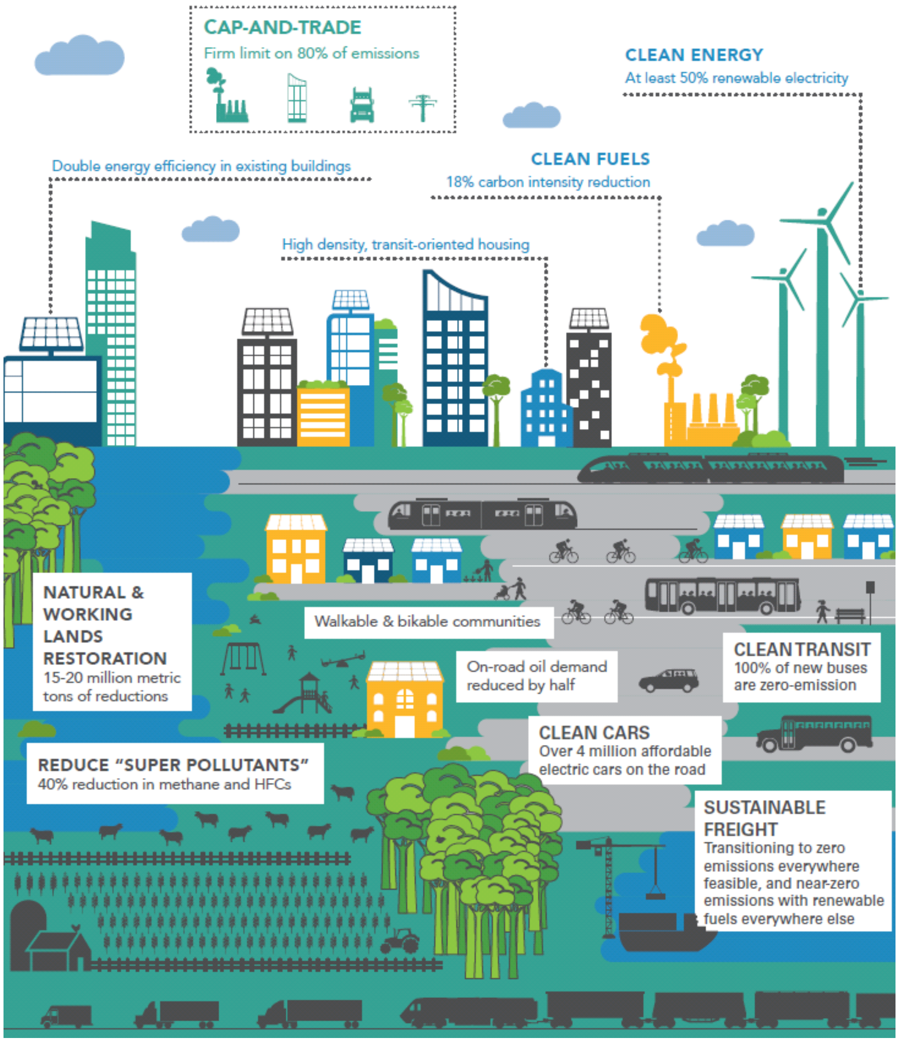
Taken together, these CEQA provisions motivate local jurisdictions to prepare and implement “CEQA-qualified” CAPs that support forward planning efforts, inform the allocation of municipal resources, and provide a degree of certainty to the development community. As the City pursues subsequent phases of the GPU, its CEQA-qualified CAP will help to ensure consistency with the state’s climate action goals and policies while streamlining the local development review process.

4.1.6 Toward a Carbon-Neutral Future

In September of 2018, Governor Jerry Brown issued Executive Order B-55-18, committing California to a carbon-neutral economy by 2045. SB 100 accompanies this executive order and mandates that all of California’s electricity supply be 100 percent renewable and emission-free by 2045. While it remains to be seen how these initiatives will affect climate action at the local level, they will inevitably spur innovation in a variety of fields. In particular, these initiatives will motivate significant changes in how electrical power is produced, distributed, and utilized. As part of its economic development strategy, the City might explore ways to recruit and support businesses that help to move California and the nation toward a carbon-neutral future.

CARB's 2017 Scoping Plan outlines a wide range of strategies designed to achieve these ambitious goals. These strategies are summarized in Figure 13.

Figure 13: California's 2030 Vision



Source: 2017 Scoping Plan (CARB)

CHAPTER 5

REGIONAL SETTING

5.1 Regional Setting

With ambitious and innovative approaches to GHG emissions reduction, the San Diego region is at the forefront of climate action, setting an example for other areas of the state as well as the rest of the country. In both the public and private sector, addressing the phenomenon of climate change is becoming standard practice in the San Diego region, with a growing understanding that climate action not only protects public health and safety but also enhances quality of life and creates economic opportunities. The City of Oceanside can take advantage of the region's strong knowledge base, policy framework, and funding commitment to further many of its climate action goals.

- SANDAG has planned and funded a significant expansion of regional transit service and active transportation facilities, created a blueprint for regional sustainability, supported Smart Growth at the local level through grant programs and policy guidance, and offered member jurisdictions a wide range of services and resources in support of their climate action efforts.

- Among the state's major electric utilities, SDG&E has achieved the highest percentage of renewable power in its energy portfolio (45 percent as of September 2018). SDG&E has also funded energy efficiency improvements for qualifying customers, provided training through its Energy Innovation Center, and promoted EV ownership through its Power Your Drive program.

Refer to Appendix A.2 for the regional emissions reduction efforts.

- In the business community, trade organizations like CleanTech San Diego have helped to position the region as a global leader in the green economy. Among its many initiatives, CleanTech San Diego leads the Smart Cities program, which deploy "Internet of Things" (IoT) technologies that reduce GHG emissions by improving connectivity in municipal operations.

- The San Diego Regional Green Business Network has encouraged hundreds of business in the region to make their operations more efficient, less wasteful, and cleaner through energy use benchmarking and other strategies.

- The Scripps Institution of Oceanography, the Environmental Policy Initiatives Center, and other research facilities in the region have contributed significantly to our understanding of the dynamics of climate change and what can be done to mitigate and adapt to its effects.

- Non-governmental organizations like the San Diego Foundation, Climate Action Campaign, San Diego Climate

Action Network, and the Sierra Club have promulgated a variety of climate action policies that have challenged both local government and the business community to address climate change in proactive, systematic, and inclusive ways.

While these efforts are noteworthy, this chapter focuses on the regional policies, programs, and resources that directly support climate action in the City of Oceanside. Most of these policies, programs, and resources are promulgated by SANDAG, of which the City of Oceanside is a member jurisdiction. While SANDAG's principal mission involves the planning and funding of regional transportation facilities, the agency also brings together the region's 19 local jurisdictions to coordinate on land use, housing, environmental stewardship, and other matters that impact public health, quality of life, and the regional economy. In recent years, SANDAG has taken on a prominent role in regional climate action, developing a Sustainable Communities Strategy (SCS) (as required by SB 375), preparing regional GHG emissions inventories, assisting member jurisdictions with preparing and implementing their CAPs, and coordinating with SDG&E and other agencies to promote energy efficiency, renewable energy, and a region-wide shift to zero-emission vehicles. The City of Oceanside has benefitted from SANDAG funding and technical assistance and continues to work with SANDAG to align the City's climate action efforts with regional goals and policies.

SANDAG has partnered with the San Diego Metropolitan Transit System to design, fund, and build the Mid Coast Trolley, which will connect Old Town with University City.

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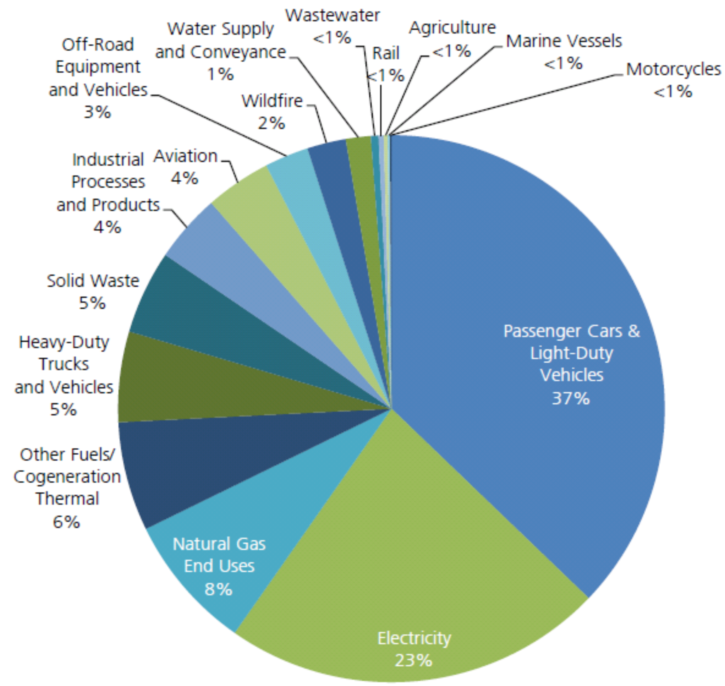
5.1.1 Greenhouse Gas Emissions in the San Diego Region

Periodically, SANDAG completes a comprehensive GHG emission inventory for the region. The inventory identifies and quantifies the sources of GHG emissions and allows for monitoring over time. In 2012, emissions totaled approximately 35 million metric tons of carbon dioxide equivalent (MMTC0_2e). Passenger vehicle trips make up the largest source of GHG emissions in the region, followed by electricity and natural gas consumption. This inventory will be updated with a 2016 baseline for San Diego Forward: The 2019-2050 Regional Plan.

Figure 14: GHG Emissions Inventory for the San Diego Region (2012)



Source: SANDAG White Paper on Climate Change

The 2012 regional inventory reveals both similarities and differences between the distribution of GHG emissions in the San Diego region and across the state. Similar to the statewide distribution, nearly 40 percent of emissions in the San Diego region stem from vehicle transportation. This speaks to the lack of convenient and cost-competitive transit options for many Californians – particularly those residing in suburban locations. Industry and agriculture generate substantially fewer emissions in the San Diego region than they do statewide. While manufacturing is the second largest economic sector in the San Diego region, only a small percentage of manufacturing in the region involves first-stage processing of raw materials (e.g., petroleum, metals, wood, fiber). Although agriculture remains an important economic sector in the San Diego region, animal husbandry and mechanized farming operations are relatively limited. Of note is the extent to which aviation (four percent) and wildfire (two percent) contribute to regional emissions; with the aviation industry growing and wildfire becoming more frequent and intense, the percentage of emissions stemming from these two sources could increase over time.

5.1.2 SANDAG and Senate Bill 375

SB 375 is the only statutory GHG reduction requirement for regional planning agencies, but SANDAG plays a role in reducing GHG emissions in other ways. In accordance with SB 375, SANDAG develops a SCS as an element of the Regional Plan. The SCS, among other strategies and goals, demonstrates how the region will coordinate regional transportation planning, regional housing needs allocation, and local land-use planning to meet the passenger-vehicle GHG-emission targets set by CARB *if there is a feasible way to do so*. These targets do not include reductions from improved vehicle efficiency and cleaner fuels. The per-capita passenger vehicle GHG targets for the 2015 Regional Plan were reductions of seven percent by 2020 and 13 percent by 2035 (from estimated 2005 emissions). The 2015 Regional Plan met and exceeded these targets. CARB is expected to adopt new, higher SB 375 GHG-reduction targets for regional planning agencies in 2018, and these will be in effect for the 2019 Regional Plan.

SANDAG's 2015 Regional Plan included many features designed to promote sustainability and reduce GHG emissions in order to be consistent with the intent and goals of SB 375. These features include:

- Emphasis on investments in transit, managed lanes, active transportation, transportation demand management (TDM) and transportation system management (TSM) that reduce VMT, energy consumption, GHG emissions, and air pollutant emissions
- De-emphasis of traditional highway investments
- An SCS, based on the regional growth forecast, that exceeds the SANDAG SB 375 GHG-reduction targets for VMT, energy consumption, GHG emissions, and air pollutant emissions

The 2015 Regional Plan is a balanced approach that provides many choices for people to get to work, school, or play. It does not represent "business as usual" investments in primarily highway expansion, and includes more investment in transit and active transportation than any previous Regional Transportation Plan (RTP).

Transit expenditures make up approximately 50 percent of the expenditures in the 2015 Regional Plan. There are five new light rail transit lines, complete double-tracking of the LOSSAN Rail Corridor and

SPRINTER rail corridor, new express bus services, and increased frequencies for all transit modes. The 2015 Regional Plan also funds Active Transportation, TSM, and TDM programs.

The SCS land use pattern demonstrates that the San Diego region is planning for compact, higher density development located near transit and within the already-urbanized areas of the region as envisioned by SB 375. Much of the San Diego region will remain undeveloped in the future because of the designated park, open space, national forest, and habitat lands. More than 80 percent of new housing will be attached multi-family. The land-use pattern accommodates 79 percent of all housing and 86 percent of all jobs within the portion of the region covered by the Urban Area Transit Strategy, where the greatest investments in public transit are focused. Meanwhile, the 2015 Regional Plan will maintain more than 55 percent of the region's land area as open space and parkland.

5.1.3 Climate Action Planning Across the San Diego Region

As of February of 2018, the majority of the local jurisdictions in the San Diego region had either adopted a CAP or were in the process of development. In addition, the Port of San Diego, SDCWA, San Diego Unified School District, and local universities have also developed CAPs.

For the most part, local CAPs in the San Diego region apply emissions reduction targets consistent with statewide emission limits (i.e., no more than six metric tons $C0_2e$ per capita by 2030 and no more than two metric tons $C0_2e$ per capita by 2050) and show downward emissions trends consistent with statewide objectives.

Local CAPs account for GHG reduction measures that typically address the following sectors: transportation and land use, electricity, natural gas, solid waste, water, and wastewater.

To achieve state-aligned targets, local CAPs first account for GHG reductions from state-level strategies and then identify additional measures that further reduce emissions at the local level. Local measures typically don’t address industrial or agricultural emissions.

In 2016, SANDAG began offering climate-planning services to 16 cities through the Energy Roadmap Program. The climate-planning services include updated GHG-emissions inventories for all cities at regular intervals as well as customized technical assistance from climate-planning consultants and dedicated SANDAG staff at no cost. As a part of the climate-planning services, SANDAG has developed a Regional Framework for Climate Action Planning (Regional Framework). The Regional Framework is a guidance document that identifies best practices for preparing local CAPs and monitoring their implementation. Created with input from local jurisdictions and agencies, the Regional Framework is consistent with state policy. The Regional Framework includes a series of appendices that cover relevant methodologies, data sources, state legislation, local applications, and emerging issues in significant detail.

CHAPTER 6

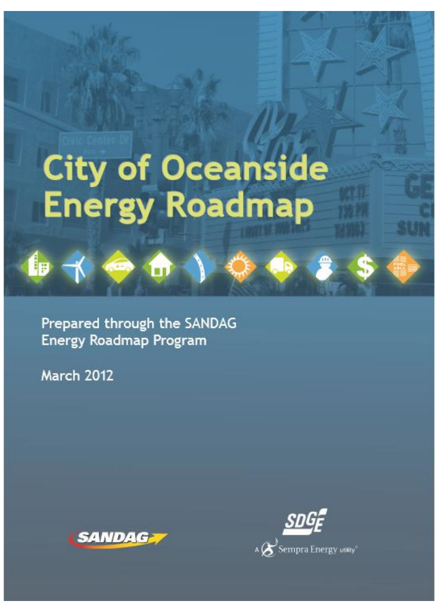
LOCAL SUSTAINABILITY EFFORTS

6.1 Local Sustainability Efforts

Reducing the City's carbon footprint requires both local government action as well as commitment from residents, business owners, and others in the community to reduce their reliance on fossil fuels, pursue clean and renewable energy sources, reduce, reuse, and recycle solid waste, conserve water, and carefully manage the City's land resources. The City is committed to reducing its dependence on fossil fuels in a manner that promotes economic prosperity and quality of life.

By using energy more efficiently, harnessing renewable energy, recycling waste, conserving water, and enhancing access to sustainable modes of transportation, the City can reduce costs, increase business activity, generate new green jobs, and improve the lives of Oceanside residents in sustainable ways.

A sustainable approach to growth includes efforts that promote renewable energy and energy efficiency, efficient land use patterns and multi-modal transportation options, solid waste reduction, water conservation, urban greening, local agriculture sources, and sustainable consumption. The City of Oceanside strives to provide a variety of services and programs that will reduce its carbon footprint and save money for Oceanside residents.



The ECAE builds upon the Energy Roadmap Program intended to reduce energy use

In 2013, the City prepared a GHG emissions inventory for community and municipal operations as an effort to establish a baseline for emissions and subsequent emission reductions. The Community Inventory includes GHG emissions generated within the City and many indirect GHG emissions that occur outside of the City resulting from community activities. The Municipal Inventory, a subset of the Community Inventory, identifies GHG emissions resulting from government operations. The City's CAP summarizes the emission sources and provides measures the City will take to achieve the State's 2020 and 2030 per capita GHG reduction targets. The CAP is provided as Appendix A.1.

The City has actively engaged with SANDAG to reduce GHG emissions and prepare for the impacts of climate change. The City participates in the SANDAG Energy Roadmap Program, which is funded by a Local Government Partnership (LGP) with SDG&E and provides free energy assessments and energy management plans to local jurisdictions. The City has benefitted from SANDAG funding and technical assistance and continues to work with SANDAG to align the City's climate action efforts with regional goals and policies.

Additionally, the City is a participant in the Institute for Local Government's Beacon Program. The Beacon Program is a statewide program recognizing cities and counties that are working to reduce GHG emissions, save energy, and adopt policies and programs that promote sustainability. In 2016, the City's efforts resulted in a Gold Level Award in Sustainability Best Practices. In 2018, the City received the Platinum Level Award in Sustainability Best Practices.

City of Oceanside
Sustainability Best Practices Activities

This document tracks and shares the City's GHG emissions reduction efforts in support of the Beacon Program

Considering municipal emissions only account for 2.5 percent of total community emissions for the City of Oceanside, it is important to recognize that personal choices and actions are also necessary to achieve significant GHG reductions and meet state and regional targets.

Recognizing that society tends to respond best to market-based solutions that encourage innovation, offer a range of options, and respect that different circumstances call for different approaches, the City does not seek to dictate individual lifestyle choices. However, through educational outreach and its own efforts to reduce GHG emissions in municipal operations, the City can help residents and other local stakeholders better understand the relationship between their personal choices and their carbon footprints. With transportation responsible for nearly a third of all GHG emissions in the United States, choosing to walk, bicycle, carpool, use transit, and/or purchase a low or zero-emission vehicle can contribute significantly to a sustainable lifestyle. With the production and distribution of consumer goods accounting for more than a quarter of total emissions, purchasing resilient goods with minimal packaging can appreciably reduce one's carbon footprint. With energy use in buildings responsible for nearly 20 percent of the country's total GHG emissions, installing energy efficient fixtures and sourcing renewable power can result in meaningful emissions reduction. Additionally, with food production responsible for almost 15 percent of total emissions nationwide, choosing local, organic, and plant-based food is another personal choice that promotes sustainability. Based on one's financial resources, access to mobility options, choice of employment, choice of housing, and other factors, there are myriad ways to reduce one's carbon footprint. More detail on individual choices is provided in Chapter 6. The sum of such individual choices will largely determine the extent and efficacy of community-wide emissions reduction efforts in Oceanside.

The following section includes actions the City has already undertaken or plans to undertake in support of the effort to reduce GHG emissions and become an increasingly sustainable community. Ideas to help residents reduce their own climate footprint are also addressed. This section is organized into the seven themes that have been identified in the ECAE:

1	Renewable Energy and Energy Efficiency
2	Smart Growth and Multimodal Transportation
3	Zero Waste
4	Water Conservation
5	Urban Greening
6	Local Agriculture
7	Sustainable Consumption

6.2 Renewable Energy and Energy Efficiency

Electricity consumption and natural gas use account for about 26 and 16 percent of Oceanside's GHG emissions, respectively. In order to help meet GHG emission reduction targets, the City is committed to providing green, renewable, and reliable energy to its citizens. In addition to providing environmental benefits, investing in renewable energy and energy efficiency can contribute to economic development and provide significant cost savings to Oceanside stakeholders.

6.2.1 City Efforts

The following actions demonstrate the City's commitment to investing in renewable energy and energy efficiency improvements.

- The City has installed PV systems at the following City facilities:
  - Melba Bishop Park
  - Fire Station #7
  - El Corazon Senior Center
  - Jones Road Training Facility
  - Fire Station #4 and #6
  - Martin Luther King Junior Park

  - City Operations Center (COC)
- The City has retrofitted more than 7,700 street lights with LED technology.
- The City has implemented a "Green Fleet" policy and is committed to having a 100 percent clean-and-green fleet by using fuel efficient, low-emission vehicles and equipment. Waste disposal vehicles servicing the City are Compressed Natural Gas (CNG)-powered.
- In 2015, the City won the SDG&E Energy Showcase Energy Champion Award recognizing the City's energy, solid waste, and conservation efforts.
- In 2013, the San Luis Rey Solar Panel Project was completed. This project provides an alternative source of energy for the San Luis Rey Water Reclamation Facility.

The City plans to continue and expand upon existing efforts to reduce its dependence on fossil fuels. By using energy more efficiently and harnessing renewable energy, the City can reduce GHG emissions while improving public health and quality of life. In addition to the actions listed above, the City plans to further reduce GHG emissions attributed to the energy sector by promoting energy measures that will increase community-wide building, equipment efficiency, and renewable energy use. The City will specifically continue to:

- Explore CCA as a means of sourcing utility-scale renewable energy;
- Expand solar PV systems at municipal facilities;
- Encourage energy efficiency and conservation in existing and proposed development; and
- Recruit businesses in "Cleantech" and other green sectors.

6.2.2 Individual Efforts

Oceanside residents and local business owners are encouraged to invest in energy efficiency. Reducing energy consumption through increasing the efficiency of energy technologies, reducing energy use, and using alternative sustainable sources of energy are effective ways to reduce GHG emissions and provide cost-savings opportunities. Oceanside residents and business owners are encouraged to:

- Install residential and commercial PV systems;
- Install energy efficient lighting and appliances;
- Eliminate wasted energy by turning off appliances, lights, and equipment when not in use;
- Replace or clean filters and vents in home cooling and heating equipment;
- Install energy efficient windows; and
- Replace incandescent light bulbs with compact fluorescent bulbs.

Many residents have switched to solar PV to reduce their overall energy consumption

Solar PV and energy efficiency upgrades not only reduce GHG emissions, but provide financial relief to families with high energy costs. There are multiple programs, including the California Solar Initiative, Energy Upgrade California, Energy Savings Assistance Program, and many others, that provide energy rebates, incentives, and low-income assistance programs to homeowners.

6.3 Smart Growth and Multimodal Transportation

Smart growth is a form of land development that accepts that growth and development will continue to occur and seeks to direct growth into already developed neighborhoods by creating more compact, walkable urban centers.

Mobility hubs are places of connectivity where different modes of travel – walking, bicycling, transit, and shared mobility – converge and there is a concentration of employment, housing, shopping, and/or recreation. Typical features can range from bikeshare, carshare, electric vehicles, to bike and pedestrian improvements.

On-road transportation sources account for nearly half of the City's community GHG emissions. The City can reduce VMT and encourage alternative modes of transportation by coordinating integrated land use and transportation design. SANDAG has identified Smart Growth Opportunity Areas (SGOAs) throughout the City that can accommodate future population, employment, housing growth, and **mobility hub** features in urbanized areas.

6.3.1 City Efforts

Smart growth improves accessibility to alternative modes of transportation, discourages single occupancy vehicle ridership, and encourages non-vehicular personal movement. By improving the connectedness of the City overall, GHG emissions attributed to transportation are likely to be reduced. The City has done the following to promote efficient land use and alternative forms of transportation for the community.

- Adopted the Coast Highway Vision and Strategic Plan to revitalize and enhance the Coast Highway corridor. The Plan promotes transit, pedestrian, bicycle, and multigenerational-friendly infill development.
- Created a Pedestrian Master Plan that establishes future planning and design standards for development, emphasizes connectivity, prioritizes improvements that close gaps between existing pedestrian facilities, and focuses on creating an accessible and safe travel network for pedestrians.
- The City's Circulation Element supports the idea of complete streets and the needs of bicyclists, pedestrians, transit, and rail users. The City has nine miles of bike paths, 17 miles of bike routes, 70 miles of bike lanes, and has been recognized by the League of American Bicyclists as a Bicycle Friendly Community.

- The Mission Avenue Improvement Project implements **sharrow** lanes to encourage shared bike and vehicular use, thereby promoting bicycling activity.
- The City is participating in the NCTD Technical Working Group (TWG). The TWG is undertaking a study to improve access to the transit system and encourage local and regional GHG reduction and housing goals. The TWG's goal is to review land use and development corridors that provide opportunities for more efficient transit.
- The City's adopted General Plan Housing Element focuses future housing growth onto existing transit-rich corridors while discouraging urban sprawl.
- In 2013, the City approved a Safe Routes to School (SRTS) project for Lincoln Middle School and Palmquist Elementary School to improve pedestrian safety.

A **sharrow** is a street marking that depicts a bicycle below two chevrons. The sharrow is a reminder to drivers to share the road with cyclists.

In addition to promoting smart growth development, the City plans to expand the EV charging infrastructure throughout the City. The use of ZEVs (including plug-in, battery, plug-in hybrid, and hydrogen fuel cell EVs) in place of traditional fossil fuel vehicles results in substantial GHG reductions. The City is committed to providing infrastructure necessary for these vehicles as well as incentives to car buyers, particularly low-income households interested in purchasing EVs.

NCTD offers services that are a vital part of San Diego's regional transportation network

6.3.2 Individual Efforts

Advances in technology, including Information and Communication Technologies (ICT), have changed how people work and communicate. ICT enables residents to work from home more efficiently and thus makes telecommuting a viable option. Considering that transportation sources are the largest single source of GHG emissions; reducing VMT attributed to commuting to and from work is important to reduce the City's carbon footprint. While the City ensures that land use policies and zoning regulations facilitate efficient land use to accommodate future population, housing, and employment growth, individuals can make conscious choices to reduce their transportation impacts.

- Purchase a fuel-efficient or ZEV;
- Choose to live near public transit and use public transit;
- Utilize alternative modes of transportation (i.e. walk or bike);
- Telecommute whenever possible; and
- Plan out trips in advance and combine multiple trips where possible.

The San Luis Rey River Trail is used for recreational purposes by other non-motorized users such as hikers, runners, and roller-bladers

As more Oceanside residents choose to reduce their single occupancy vehicle ridership, such as participating in SANDAG's iCommute, the City will experience a decrease in on-road transportation GHG emissions, which is currently the largest sector of community GHG emissions.

6.4 Zero Waste

Solid waste disposal accounts for approximately four percent of the City's community GHG emissions. Technologies and strategies for enhancing sustainability include the zero waste program, which promotes alternatives to reduce the percentage of solid waste deposited in landfills.

6.4.1 City Efforts

The City is committed to waste diversion and recycling with a goal of reaching a 75-90 percent diversion/recycling rate by 2020. In order to meet the target diversion/recycling rate, the City has accomplished the following:

- Adopted a Zero Waste Strategic Resource Management Plan. This plan outlines the policies that will help the City achieve a 75 percent or higher waste diversion rate by 2020;
- Achieved a 67 percent diversion/recycling rate;
- Committed to composting all residential green waste;
- Implemented a Construction and Demolition Recycling Program to support the CalGreen Building Code;
- Adopted a Single-Use Carryout Bag Ordinance;
- Adopted an Environmentally Preferable Purchasing Policy to procure recycled content products and eliminate wasteful packaging in City operations;
- Funded the purchase and installation of water refill stations in City facilities;
- Expanded residential donation programs;
- Encouraged landfill diversion by charging residents more for larger landfill carts;
- Required the separation of all recyclable material and green waste from other solid waste;
- Partnered with Oceanside Unified School District to adopt a zero waste education program (Zero Waste School Initiative); and
- Developed a program to reuse backyard produce from residential homes to feed people in need **(gleaning).**

By recycling green waste locally, the City minimizes the amount of waste and recyclable material getting transported outside of the City

Gleaning is the practice of collecting excess fresh produce (such as citrus) from farms, gardens, and backyards and providing to people in need.

Additionally, the El Corazon Compost facility contributes to the City's zero waste goals and helps the City reach its GHG emission reduction targets by reducing the amount of organic waste and recyclable material being transported outside of the City and into landfills. The facility supplies compost with a natural addition that enriches the soil, increases water absorption, and assists in aeration. The facility has successfully processed over one million tons of green waste into high quality soil amendments, mulch, and potting mixes.

The City plans to continue to reduce the percentage of solid waste deposited in landfills and comply with the State's goals for reduction in disposed organic waste. Additionally, the City plans to:

- Improve its composting operations and include food recovery to benefit low-to-moderate income residents while also supporting GHG emission reduction goals.
- Develop an ordinance to limit the sale of polystyrene, single use plastic, and other hard to recycle materials.
- Evaluate options for organic food waste collection systems for commercial and residential properties.
- Provide services to the community, including culinary arts training focused on sustainability and waste prevention, through the El Corazon Sustainability and Culinary Arts Kitchen.

6.4.2 Individual Efforts

The key to generating less waste is to reduce the amount people buy or consume and reuse products that are purchased. Making the choice to consume less provides more social and environmental benefits than recycling and composting alone. It is important to note that small daily choices and habits add up. If individuals commit to the following actions, the City will be closer to attaining its zero waste goal:

- Reduce needless consumption and the generation of waste.
- Reuse any item that can be reused, or give it to a person/charity that can reuse it.
- Recycle whatever you can and only dispose of what you must.
- Rot your food and yard waste through composting – nature's way of recycling.
- Donate excess food through gleaning. Gleaning reduces food waste that goes into landfills.
- Attend a class or workshop to learn about composting and vermicomposting.

6.5 Water Conservation

Water distribution and wastewater treatment account for approximately four percent of Oceanside's community GHG emissions. General strategies for reducing energy use associated with the water and wastewater sectors include increasing the efficiencies of local water and wastewater treatment and distribution facilities, reducing reliance on imported water sources, and reducing overall water use.

The City is committed to managing its water resources efficiently and ensuring a reliable water supply for future generations.

6.5.1 City Efforts

As a part of the water conservation efforts to achieve a 20 percent water use reduction mandated by Governor Brown's 2015 Executive Order, the City has done the following to conserve water resources.

Oceanside's reclaimed water is kept in a reservoir before it is pumped to the Oceanside Municipal Golf Course or a bird sanctuary

- Implemented turf removal at approximately 22 City owned facilities and parks. Over 131,228 square feet of irrigable turf has been removed, estimated to save approximately 5,774,032 gallons of water per year.
- Implemented mandatory water use efficiency measures (i.e. re-circulated water in fountains and water features).
- Provided incentives for water-efficient devices and recognizes residents who have made efforts to conserve water and use it wisely.
- Sponsored a Residential Landscape Transformation Program for homeowners who plan to replace their turf with water efficient plantings.
- Treated reclaimed water at the San Luis Rey Water Reclamation Facility. The facility produces up to 500,000 gallons of water per day, which is stored in a reservoir on-site and pumped to the Oceanside Municipal Golf Course and the Whelan Lake Bird Sanctuary.
- Implemented the Pure Water Oceanside Program that purifies water to create a new, local source of high-quality drinking water that is clean, safe, drought-proof, and environmentally sound. The program will produce enough water to provide more than 25 percent of the City's water supply.

The City will continue to reduce per-capita water consumption to comply with state requirements and meet established targets for GHG reductions.

6.5.2 Individual Efforts

The WaterSmart Program helps Oceanside residents understand their water usage and offers customized recommendations for the most effective ways to save water

Using water efficiently is critical to ensuring an adequate water supply for Oceanside. The following strategies will help Oceanside residents conserve water and help the City to reduce indoor and outdoor water consumption, thereby reducing emissions attributed to the water and wastewater sector:

- Enroll in the Oceanside WaterSmart Program to manage water use;
- Remove turf and replace with water-efficient landscape;

- Attend classes such as the "WaterSmart Landscape Design Workshop for Homeowners" to learn how to plant a water efficient landscape;
- Collect rainwater for outdoor water needs;
- Repair broken sprinkler nozzles and irrigation leaks;
- Use recirculated water in fountains and water features; and
- Conserve water with water-efficient showerheads and faucets.

6.6 Urban Greening

Planting trees in urban environments can help reduce GHG emissions by naturally sequestering carbon dioxide. Trees provide shade, reduce the temperature of streets and parking lots, and enhance the visual aesthetic of a community. Trees can provide valuable and viable services, including clean air, increased property values, and community enrichment. Expanding the City's tree canopy not only benefits the community, but also has many benefits to homeowners, including energy conservation. Trees can conserve energy with their shading and their cooling effect by releasing moisture into the air. This results in reduced energy costs and cost savings for homeowners.

6.6.1 City Efforts

The existing tree canopy is estimated at 16 to 18 percent, which is higher than many other jurisdictions in San Diego County. The City is dedicated to expanding the urban forest within the public realm and on private property. The City has committed to the following strategies to expand the tree canopy and contribute towards urban greening.

- Update the Street Tree Ordinance and prepare an Urban Forestry Plan;
- Update the Tree Policy Manual and Maintenance Manual;
- Increase the tree canopy in public parkways;
- Replace existing palm trees with broadleaf trees to provide a larger tree canopy;
- Sponsor community gardens in neighborhoods throughout Oceanside;
- Prioritize community gardens and urban agriculture operations in areas with limited access to fresh food; and
- Educate the community on the importance of plant diversity.

Additionally, the City has an established goal of planting 200 trees per year for the next 12 years. Through events such as Arbor Day, City staff can promote the importance of planting trees at various locations throughout the City.

Trees help to sequester atmospheric carbon dioxide while providing shade and filtering airborne toxins.

6.6.2 Individual Efforts

The City encourages residents to do the following to help increase the City's tree canopy and promote carbon capture:

- Coordinate with the City to replace trees removed from parkways;
- Plant trees on private property;
- Collaborate with organizations, such as Tree San Diego, to learn about the benefits of trees; and
- Replace concrete and asphalt surfaces with permeable paving.

6.7 Local Agriculture

Carbon sequestration is the removal of carbon dioxide and other GHG emissions from the atmosphere.

The preservation of agricultural lands enhances community sustainability and helps to promote **carbon sequestration**.

6.7.1 City Efforts

The City has approximately 3,450 acres of agricultural land in South Morro Hills. As an effort to preserve this agricultural land, the City plans to:

- Pursue opportunities for agritourism, as provided in the Agritourism Strategic Plan, to preserve areas designated as agricultural by providing supplemental income to farmers in an effort to keep farming viable in the City.
- Expand allowable agriculture activities and streamline the process for agriculture activity permits.
- Install recycled water for irrigation in South Morro Hills.
- Explore ways to reduce the cost of water for agricultural use.

South Morro Hills has a strong history as an agricultural area producing citrus fruits, avocados, flowers, palm trees, nuts, strawberries, herbs, and vegetables

In addition to preserving agricultural land, urban gardens can reduce the consumption of natural resources and GHG emissions associated with food production. There are currently two urban gardens that the City manages and oversees (one is located in the Crown Heights neighborhood and the other in the Eastside neighborhood). Each garden has plots that are assigned to residents living in the surrounding community and there is a common area for fruit trees that are cared for by community gardeners.

The City can encourage the expansion of urban gardens with the following strategies:

- Establish a population ratio goal for gardens within the City to ensure that gardens are equally accessible to all members of the community.

- Identify potentially feasible site locations (undeveloped open space, utility right-of-ways, public parks, and undeveloped lots in residential neighborhoods).
- Provide monthly homegrown community workshops, in partnership with Agri Service Inc., that highlight proper techniques for gardening, compost application, and seasonal application.

6.7.2 Individual Efforts

Urban agriculture can reduce the consumption of natural resources and GHG emissions associated with food production. The City encourages residents to pursue opportunities for community and/or private gardens to become a more sustainable community and reduce the City's carbon footprint. Residents are encouraged to:

- Attend Home Grown Gardening classes sponsored by Agri Service. These classes provide homeowners an opportunity to learn how to grow food in their own backyards or community gardens.
- Freeze, can, dry, and preserve local seasonal fruits and vegetables.

6.8 Sustainable Consumption

Sustainable consumption is an important component to reducing a community's carbon footprint. Fundamental changes in the way people produce and consume are indispensable for achieving GHG emission reductions.

6.8.1 City Efforts

Through the Green Oceanside Campaign, the City is committed to educating residents and business owners about the environmental impacts of their choices. The following list illustrates the efforts the City has already undertaken to raise awareness of sustainable practices.

Green Oceanside educates residents, businesses, and visitors about how to be better stewards of the earth

- The Green Oceanside Business Network recognizes businesses that are environmental leaders that incorporate sustainable practices.
- The Green Oceanside team provides environmental educational outreach for youth, residents, and businesses. Green Oceanside educates and helps raise awareness of sustainable practices and conservation of natural resources.
- The City launches the Zero Waste Schools Initiative, which facilitates and supports zero waste educational programs, infrastructure development, and purchasing/servicing policies and programs within all 23 schools in Oceanside.
- The City has a weekly Farmer's Market to support the availability of locally grown produce.
- The El Corazon Sustainability and Culinary Arts Kitchen operations are centered on the principle of utilizing local food resources. This includes sourcing from local farms, markets, and food service facilities with the goal of preventing the waste of edible food.

6.8.2 Individual Efforts

The Green Oceanside campaign educates residents how to be better stewards of the earth and to reduce their impact on the environment. The following personal actions help to achieve a sustainable community and reduce GHG emissions:

Farmers markets feature dozens of vendors offering a rich variety of fresh local produce, flowers, nursery items, and more

- Support local businesses by shopping local;
- Purchase locally-produced food;
- Avoid excessively packaged food;
- Consider a plant based diet;
- Pack a reusable water bottle;
- Purchase a reusable lunchbox; and
- Attend Green Oceanside workshops to learn about sustainability.

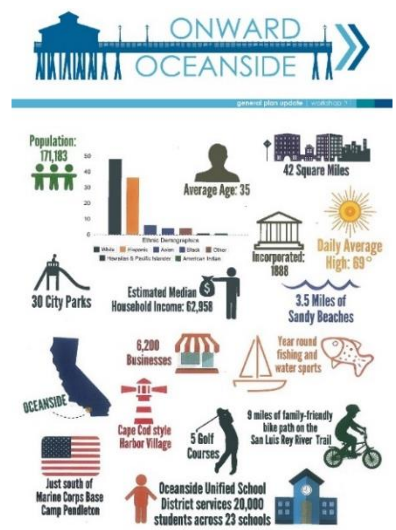
The City will continue to pursue GHG reduction in local government operations while encouraging emissions reduction in the community at-large through a combination of requirements, incentives, and community outreach efforts. In addition to efforts made by the City, goals and policies to encourage residents to make personal choices regarding sustainability and GHG emission reductions are critical to long-term strategies at reducing the City's carbon footprint. Achieving the City's GHG emission reduction goals will require a collaborative effort between local government, residents, and business owners. Through implementation of the actions listed in the preceding section, the City can move deliberately toward a more sustainable and economically prosperous future.

CHAPTER 7

PUBLIC OUTREACH

7.1 Public Outreach

The ECAE effort has involved extensive public outreach, and public input has contributed significantly to the formulation of ECAE goals, policies, and action items. To inform stakeholders of this planning effort and solicit their input, the EDE team developed a project webpage, hosted stakeholder interviews with key constituencies, conducted an online survey, held a public workshop, met with members of the business community in various forums, solicited public input through "pop-up" outreach activities at numerous community events, sponsored a high school speech contest and other youth outreach efforts, conducted a public scoping meeting for the associated Environmental Impact Report, and encouraged public engagement through press releases, email blasts, and articles in the Oceanside Tide newsletter.



The online survey asked respondents to:

- Rank how familiar they are with the concept of climate change;
- Express how important it is for the City to reduce GHG emissions in an effort to curb climate change;
- Identify the greatest potential climate change impacts facing Oceanside;
- Select the top three concerns that have the greatest potential to hinder the City's efforts to reduce GHG emissions;
- Describe the actions they have taken over the last five years to reduce energy and/or water consumption in their homes or place of business;
- Identify the actions they are planning to make over the next five years to improve the sustainability/efficiency of their home and/or place of business;
- Rank how optimistic they are that the City can both reduce GHG emissions and grow the local economy;
- Rate the GHG reduction strategies that are least and most appropriate for Oceanside;
- Describe what other GHG reduction strategies the City should consider;
- Identify if they believe the City's GHG reduction strategy should include mandates as well as voluntary, incentive-based measures;
- Select the quality of life factors that can be promoted by GHG efforts;
- Nominate individuals and organizations in the community that merit recognition in the Climate Action Plan (CAP); and
- Express their additional thoughts regarding the CAP and ECAE Element.

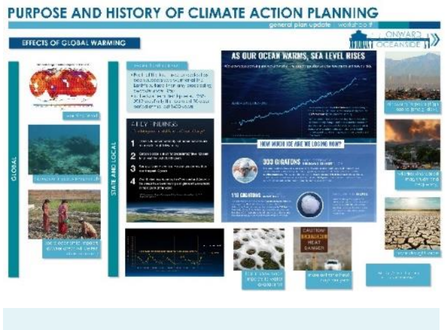
Many of respondents indicated that they are very familiar with the concept of climate change, its causes, and effects. They expressed a deep sense of urgency regarding the need to act now to address climate change. Most respondents said that it is extremely important for the City to reduce GHG emissions in an effort to curb climate change and that the City should attempt to reduce emissions as much as possible.

Please note that the results of the online survey are not necessarily a statistical representation of the population.

7.1.1 Climate Change Impacts

Survey respondents identified the following as the greatest potential climate change impacts facing Oceanside:

- Drought conditions
- Sea level rise and associated coastal hazards
- Impacts to habitats and wildlife
- Increased frequency of wildfires



Workshop participants were educated on the purpose and history of climate action planning and its effects in Oceanside

A few respondents indicated that they believe climate change will result in a devastating collapse of the human population, potentially leading to extinction. Others believe that climate change is a natural occurrence beyond human control. Respondents identified the lack of political will, lack of awareness or understanding of climate change, and insufficient funding as the top three concerns that have the greatest potential to hinder the City's efforts to reduce GHG emissions. A few others expressed the belief that it does not matter what Oceanside does because its actions will not have a big enough impact on the rest of California or the world. Others recognized that local climate action builds upon broader regional, state, national, and international efforts to reduce GHG emissions.

7.1.2 Personal Actions

Respondents are generally very optimistic that the City can both reduce GHG emissions and grow the local economy. Many respondents have already implemented changes to reduce energy and/or water consumption in their name/or place of business. Such changes include:

- Implementing water conservation measures in home and/or place of business (e.g. installed drought-tolerant landscaping, gray water system, water saving shower heads and low-flow faucet aerators, insulated water pipes, etc.)
- Improving the energy efficiency of home and/or place of business (e.g. added insulation, installed energy efficient appliances, weatherstripped windows, switched to LED lighting, etc.)
- Becoming less reliant on the automobile (i.e. choosing to walk, bike, carpool, or use public transit instead of driving alone).

Other changes included switching to an electric vehicle and prioritizing locally sourced food. A few respondents also reduced their overall consumption of water by taking shorter showers and installing rain water cisterns/barrels. The personal actions described above were also identified as the actions that respondents would like to make in the future.

7.1.3 Greenhouse Gas Reduction Strategies

Respondents generally ranked the following GHG reduction strategies as the most appropriate for Oceanside:

- New residential developments constructed to allow for easy implementation of gray water systems that allow water from sinks, showers, washing machines, and tubs to be reused for irrigation.

- Composting services for residents, businesses, and schools, and permit food scraps to be placed in greenwaste bins.
- Economic incentives to encourage green building (e.g. density bonuses, reduced permit fees, expedited processing, etc.).
- Expanded recycled water infrastructure.
- City purchasing policy that favors use of recycled content and reusable products as well as other environmentally preferable products and services.

One of the most frequent comments that arose was the desire for the City to set a goal of reaching 100% clean energy and to establish a **Community Choice Energy (CCE)** program. SDG&E would partner with the CCE to deliver that energy through the existing transmission and distribution system. Those within a CCE service area may choose to opt out of the program and continue to utilize SDG&E as their energy provider.

CCE allows cities and counties to purchase renewable energy for residents and businesses in their area.

Other popular suggestions for reducing GHGs include providing more multi-modal transportation, placing solar at public facilities along City streets, and holding public event/relations campaigns that spread awareness and education. Respondents recognize the biggest challenge to promoting public transit use is how inconvenient it currently is to use. Several respondents commented that there is a need to provide more frequent service, expand routes/improve connectivity, upgrade transit facilities, and address the difficulties associated with walking long distances to transit stops as well as final destinations after using transit services. Respondents contemplated providing a local shuttle service, encouraging the use of private transportation services (e.g. go go grandparent), and implementing parking strategies that limit free parking.

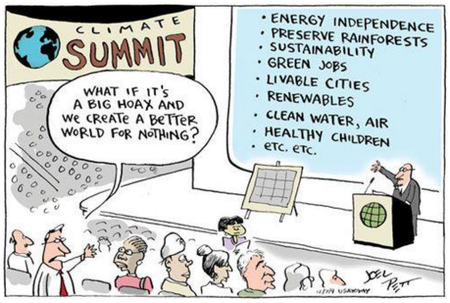
The majority of respondents believe the City's GHG reduction strategy should include mandates as well as voluntary, incentive-based measures. The City should become a model for other cities and take a more proactive goal in climate change preventions. Such methods include encouraging CCE, becoming 100% solar and partnering with solar companies, and providing more multi-modal transportation.

Respondents recognize that many of the strategies and measures to reduce GHG emissions will also have important additional benefits commonly associated with quality of life. Air quality, water quality, transportation options, and locally sourced food were identified as the top quality of life factors that would experience beneficial effects. Other factors included reducing waste, recycling, reusing, and making e-waste recycling more accessible, agricultural preservation, more agri-developments. Such actions and strategies enhance quality of life and help create thriving communities.

CHAPTER 8

CO-BENEFITS OF CLIMATE ACTION

8.1 Co-Benefits of Climate Action



Even in the absence of climate change, many GHG emissions reduction strategies would still be worth undertaking, given their contributions to public health, economic security, and environmental quality. Mitigating climate change is ostensibly about maintaining global temperatures below levels that could trigger potentially catastrophic impacts. More fundamentally, it is about preserving both the natural and built environment for future generations. Mitigating climate change helps to sustain the environmental, economic, and social systems that promote human survival, well-being, and progress.

Climate action relates symbiotically to a wide range of environmental, economic, and social initiatives, including:

- Environmental measures that further smart growth, air pollution control, solid waste reduction, water conservation, and habitat preservation;
- Economic development policies that promote emerging green industries, cost-saving technologies, and Shop Local campaigns; and
- Social programs that support environmental justice, subsidies for energy efficiency upgrades for lower-income households, and public outreach efforts that promote sustainable choices.

These symbiotic relationships often provide for reduced exposure to pollutants and other hazards, cleaner and more attractive built environments, new business and employment opportunities, reduced energy costs, increased access to essential goods and services, new venues for recreation and social interaction, etc. This chapter looks at how climate action can, and often does, produce benefits beyond GHG reduction.

8.2 Economics

Efforts to mitigate climate change can result in substantial economic benefits. These benefits stem primarily from cost savings achieved through efficiency measures, reduced risk of climate-related hazards, and entrepreneurial and employment opportunities driven by market demand for sustainable products and services.

- Changes in land-use regulations, zoning, and transportation infrastructure that create denser, mixed-use, multi-modal communities that provide housing and other essential goods

and services to growing populations of young professionals, single-person households, and seniors.
- Reduced air pollution, enhanced walkability, and protected open space result in better health outcomes, which lead to improve worker productivity.
- Multimodal transportation options provide easier access to schools, jobs, and recreation, which increases economic opportunities for those with limited resources.
- Improved energy and water efficiency, as well as the sourcing of renewable power, saves money and stimulates job creation. Job growth in the San Diego region has been fueled by a burgeoning "cleantech" sector, which produces products and services related to renewable energy, energy efficiency, clean transportation, and smart grid. The cleantech sector provides roughly 7,300 jobs in the San Diego region, with an average annual salary of $87,000.

With the support of SANDAG and the Center for Environmental Policy Initiatives (EPIC), the City has prepared a benefit-cost analysis (BCA) of those CAP emissions reduction measures that result in quantifiable emissions reduction. This analysis shows local residents and businesses achieving a positive rate of return on investments in rooftop solar PV systems. In addition, resident and businesses are saving from water conservation measures and local water sourcing implemented by the City's Water Utilities Department, smart growth policies that reduce dependence on the automobile, expanded EV charging infrastructure, and TDM strategies implemented by local businesses.

Table 2, below, is an excerpt from the BCA that illustrates the return on investment that local commercial and industrial operations can expect from installation of solar PV systems. The BCA indicates that businesses can see as much as a four-fold return on investment from these systems, due to the associated energy cost savings.

TABLE 2: SOLAR PHOTOVOLTAIC PROMOTION PROGRAM

Participant Group	BCR	Payback Period (years)	Participant $/MT CO_2E	GHG Reduced in 2025 (MT CO_2e)
Commercial and Industrial – System Owner	1.45	10.6	$7	16,450
Commercial and Industrial – Power Purchase Agreement	4.55	<1	$4	1,453

All dollar values are in 2018$
Source: Energy Policy Initiatives Center, USD 2018

Local households and businesses can pursue energy efficiency and renewable energy measures that reduce both energy and maintenance costs, as well as their exposure to volatile fossil fuel energy prices. The associated cost savings leaves households with more residual income to spend within the local economy and affords businesses an advantage over competitors who remain reliant on finite energy sources.

Proactively assessing and preparing for climate change can have substantial economic benefits in the future. Climate change has the potential to present extraordinary costs to the City. Such costs include damage wrought by sea-level rise and more intense rain events, increasing energy demand and wildfire risk brought on by rising temperatures, and prolonged drought that strains the local water supply and disrupts agricultural operations. While there is considerable uncertainty on the timing and severity of such impacts, as well as the ability to avoid, mitigate, and/or adapt to them, there are policy interventions, technological innovations, and behavioral changes that can enhance resiliency and limit economic impacts. Weighing the costs and benefits of climate adaptation strategies can inform decision-making and justify early, cost-effective investments that will assist in protecting the community from future impacts.

8.3 Public Health and Quality of Life

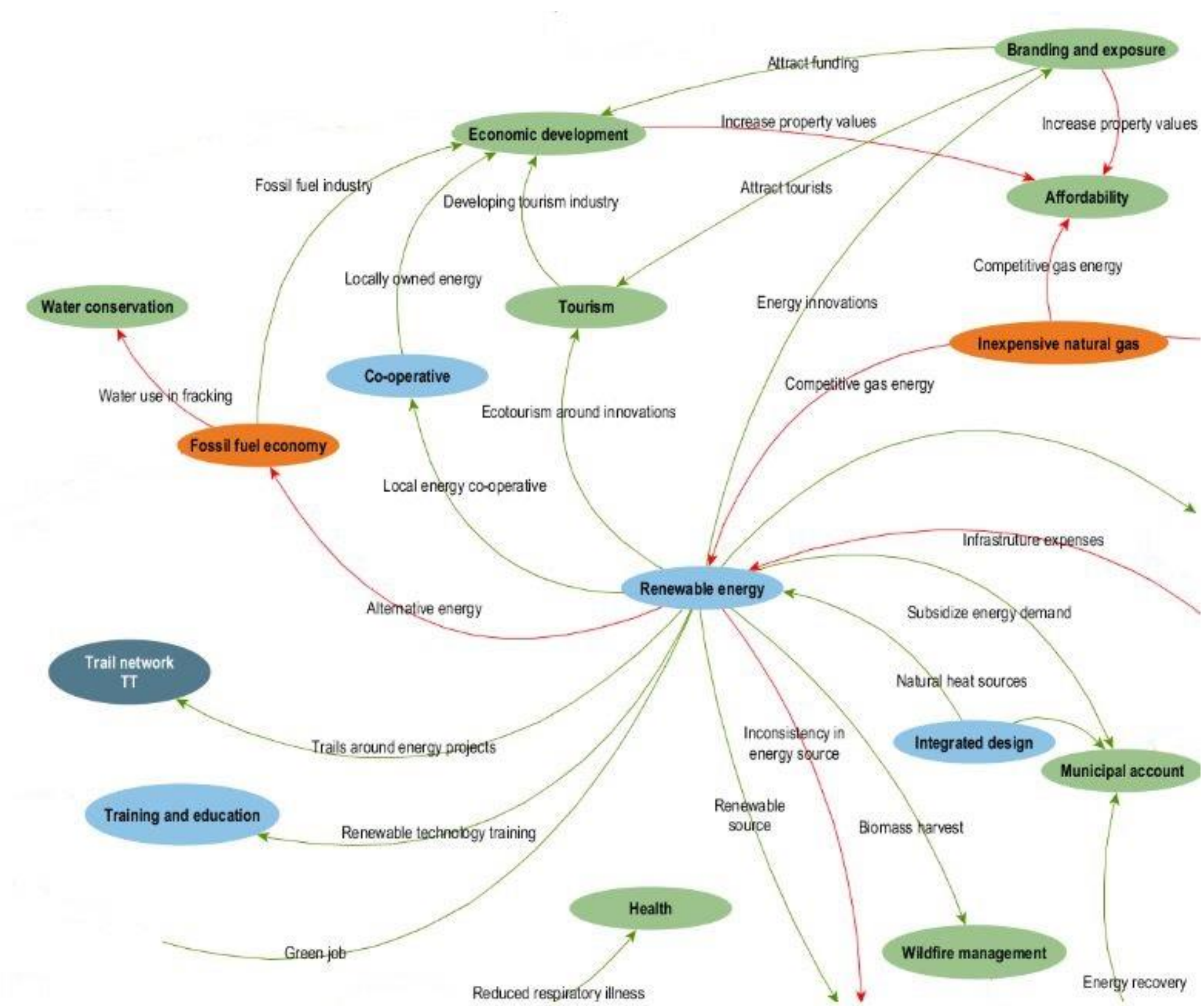
Efforts to reduce GHG emissions closely align with the goals and policies for creating a livable community. Many key strategies for reducing GHG emissions can also improve the overall health, safety, and quality of life for residents. The 2017 Scoping Plan quantifies 2030 statewide health benefits from climate action, projecting approximately 3,300 avoided premature deaths, $1.2 billion to $1.8 billion in avoided health impacts, and $1.9 billion to $11.2 billion in avoided damages based on the social cost of carbon.

Impacts to public health from climate change include: increased heat-related illnesses, asthma, allergies, and other cardiovascular and respiratory diseases; disruption in food and water; and population displacement. Impacts from climate change will not affect communities in the same way. The health impacts of climate change may disproportionately affect vulnerable populations including children, the elderly, people with chronic illness, low-income populations, and those unable to afford food or fuels for cooling and transportation. Working to create healthy communities builds a foundation for climate resiliency that benefits all segments of the population.

The expansion of pedestrian and bicycle facilities encourages physical activity and social interaction that result in measurable public health benefits. The expansion of the urban forest provides additional shade, visual interest, and wildlife that invite people into the public realm. Community gardens offer yet another reason for people to spend time outdoors and in the company of others. Coupled with the wide range of community events sponsored by the City (e.g., farmers and sunset markets, concerts in the park, athletic competitions), these initiatives promote a wide variety of community benefits while reducing VMT and associated GHG emissions. Figure 15, below, illustrates the inter-relationships between these initiatives and other elements that contribute to quality of life, economic development, ecological balance, and other benefits.

The City hosts a variety of community events such as farmers and sunset markets, concerts in the park, and athletic competitions.

Figure 15: Inter-relationships between Renewable Energy Initiatives and Other Priorities



8.4 Funding Opportunities

Climate action planning can enhance the City's eligibility for state and regional grant funding. The ECAE and CAP position the City to receive financial support for the implementation of projects and programs. They not only reduce the City's carbon footprint, but also enhance quality of life and economic opportunity.

State revenue from CARB's cap-and-trade program provides funding for communities that implement GHG emissions reduction strategies. Local jurisdictions and MPOs (e.g., SANDAG) are eligible for grants that subsidize sustainability planning as well as brick-and-mortar projects that implement smart growth components and expand alternative transportation options. Priority is given to projects that focus on low-income communities. Projects that implement affordable housing and "mobility hub" features in the City's SGOAs (e.g., redevelopment of the Oceanside Transit Center) would be eligible for state cap-and-trade funding.

Through the Smart Growth Incentive Program (SGIP) and Active Transportation Program (ATP), funded by the regional TransNet sales tax, SANDAG provides grant funding to local jurisdictions in the San Diego region for both planning and capital improvement projects that promote smart growth and alternative transportation. These programs enable and showcase projects that exemplify SANDAG's SCS and leverage regional transportation facilities to create walkable, transit-oriented environments. Oceanside has received SGIP funding for roadway and streetscape improvements on Mission Avenue and Seagaze Avenue. These improvements have enhanced pedestrian safety, increased on-street parking, added landscaping and other "green street" elements, and spurred revitalization of adjacent private property. Fostering a strong sense of place and economic revitalization, Mission Avenue from Coast Highway to Nevada Street now exemplifies how public improvements can motivate private investment that furthers the City's long-range planning goals.

Figure 16, below, summarizes the potential co-benefits of general categories of climate action. It is notable that most forms of climate action contribute to cleaner air and water, increased physical activity and social engagement, and improved visual quality, all of which contribute to positive public health outcomes.

It is important to understand the inter-relationships between climate action strategies and associated benefits, trade-offs, and barriers. Analysis of these inter-relationships informs both policy development and implementation by bringing light to those strategies that produce the most benefits with the fewest economic, environmental, and/or social costs. Developed by the British Columbia Provincial Government, the MC3 project includes conceptual maps that reveal linkages between specific climate action strategies and other key concerns. Figure 16, below, is an excerpt from one of these conceptual maps that illustrates 1) how renewable energy strategies relate to other priorities, and 2) how renewable energy initiatives are both facilitated and/or compromised by various factors. Appendix A.3 includes the conceptual maps developed by the MC3 project.

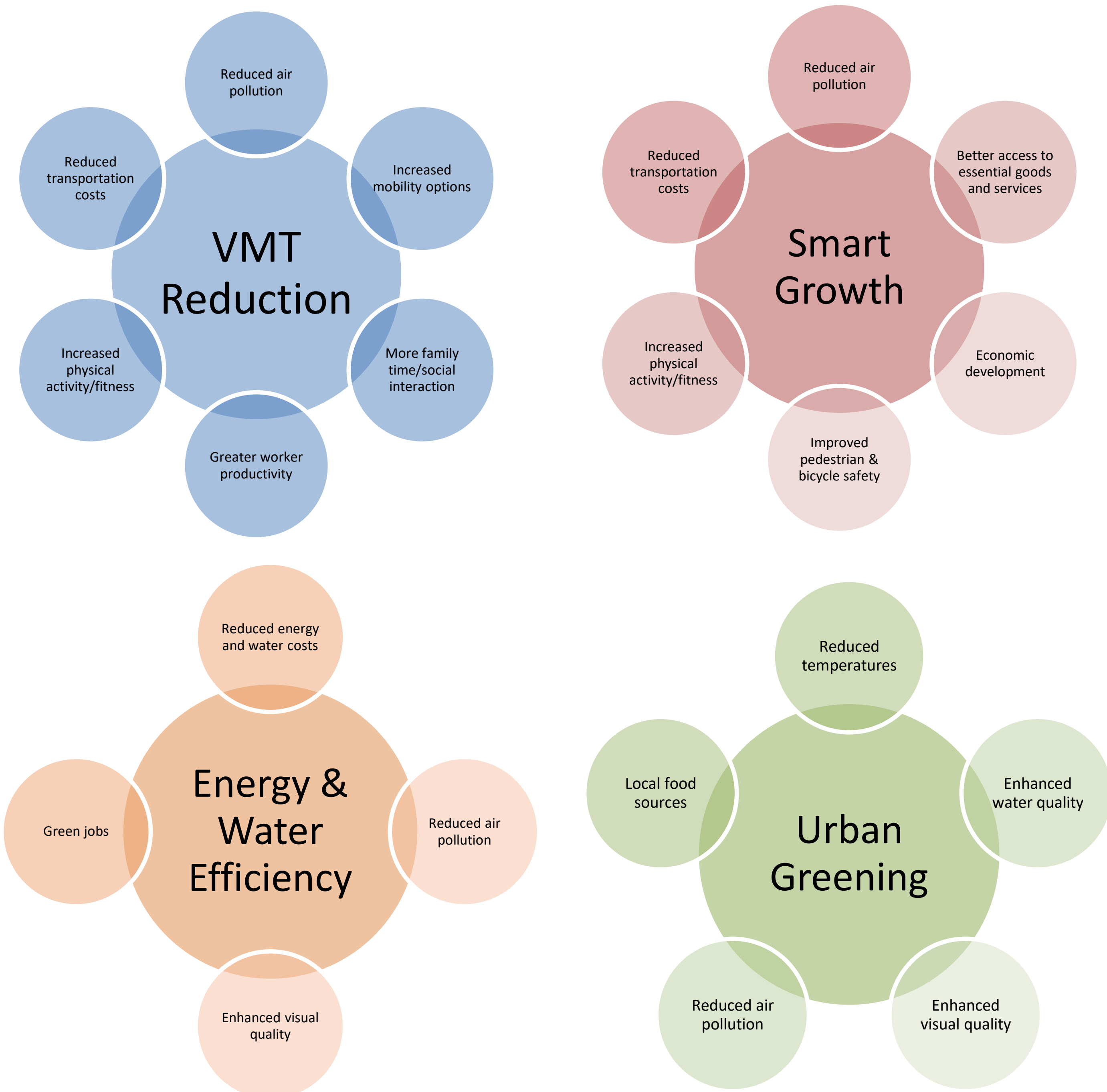
The light blue nodes in Figure 16 represent climate action strategies, the green nodes represent benefits, and the orange nodes represent problems (i.e., trade-offs, barriers, or challenges). The dark blue nodes represent strategies that link to other models, and the initials displayed on these nodes refer to the following:

- EI – energy innovation
- UD – urban densification
- MD – Mixed-used and downtown revitalization
- BS – building stock
- EC – ecological capital
- TT – trails and transportation
- WW – waste and water

Relationships in Figure 16 are classified as either positive (green) or negative (red) depending on whether an effect is enhancing/promoting or diminishing/counteracting.

On balance, climate action and related sustainable practices continue to show net positive impacts on quality of life and the economic bottom line. One of the greatest challenges facing the City, state, nation, and the international community is ensuring that these positive impacts extend to stakeholders, regardless of socioeconomic status.

Figure 16: GHG Emissions Reduction Strategies to Potential Co-Benefits



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CHAPTER 9

ECAE CONSISTENCY

9.1 ECAE Consistency with City of Oceanside General Plan

The ECAE aligns with applicable policies of the City's existing General Plan elements, including the Land Use Element (LUE), Circulation Element (CE), Housing Element (HE), Community Facilities Element (CFE), and the Environmental Resources Management Element (ERME). While most of these existing elements are somewhat dated, many of their respective goals and policies remain relevant to current conditions. For example, most of these elements encourage efficient land use and the siting of new development in proximity to employment opportunities, commercial goods, public transit, and recreational facilities. Following adoption of the ECAE and EDE, the City intends to initiate updates of these existing elements, which will provide the opportunity to further align goals and policies.

9.1.1 Land Use Element (LUE)

The LUE guides the City's review of proposed new development, providing policy direction regarding architectural quality, intensity/density, and site design. The element also addresses the relationship between development, community enhancement, and natural resource management, as part of the effort to minimize energy consumption and adverse impacts to both the built and natural environment. Like the LUE, the City's ECAE provides a policy framework for reducing energy consumption and associated emissions, accommodating population, housing, and employment growth through efficient land use, and providing a range of sustainable transportation options.

The LUE was adopted in 1986 and reformatted in 2002. A fundamental goal of the ECAE is to expand the City's housing inventory and employment base in ways that preserve natural resources, enhance quality of life, and ensure that future generations enjoy economic stability, social equity, and a healthy environment. The LUE policies that support responsible stewardship of the City's limited land resources are essential to realizing this goal.

In many respects, the relationship between the ECAE and the LUE is rooted in the concept of sustainability. The land use and transportation-related policies of the ECAE echo LUE policies that call for "consistent, significant, long term preservation and improvement of the environment" and the maintenance of a "safe, attractive, desirable, and well-balanced community." Below are some of the key linkages between the ECAE and LUE.

- Advocate for compact in-fill development that reduces sprawl and dependency on the automobile, including policies that encourage the placement of housing in close proximity to employment opportunities, commercial goods, public transit, and recreational facilities.

- Consider the long-term effects of all proposed developments, including impacts on natural habitat, energy resources, walkability, transit use, and social cohesion. These policies mirror ECAE policies that promote sustainable development.

- Acknowledge the extent of alternative transportation systems that positively contribute to the quality of life and visual quality of the City.

9.1.2 Circulation Element (CE)

The CE provides goals, objectives, and policies intended to maintain and improve the City's transportation network and enhance mobility options for current and future residents, visitors, and workers. Last updated in 2012, the CE includes several policies that promote sustainability, smart growth development, multimodal transportation, and walkability. Like the ECAE, the CE acknowledges the critical relationship between land use and transportation to improve mobility within the City.

Both the CE and the ECAE include goals and policies that encourage GHG emissions reduction through reduced dependence on private automobiles. This common overarching goal is reflected in the following shared policies:

- Encourage transit-oriented development within areas served by public transit.

- Promote the development of a multimodal transportation system that allows for the efficient and safe movement of people and goods with minimal impact to the environment.

- Expand the City's active transportation network as outlined in the City's Pedestrian and Bicycle Master Plans.

- Encourage traffic management strategies that reduce traffic volumes and improve traffic flow.

- Promote the use of alternative-fuel vehicles, including full-electric and hybrid vehicles.

Complete streets are designed, built, and operated for the safety and comfort of all road users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities.

- Encourage **"complete street"** improvements that accommodate a wide range of mobility options.

9.1.3 Housing Element (HE)

The HE is a state-mandated element that requires the City to demonstrate sufficient capacity for new housing development consistent with the Regional Housing Needs Assessment (RHNA). For the current Housing Element cycle (2010 – 2020), the City had to demonstrate capacity for more than 6,200 new dwelling units provided for all economic segments of the community. This capacity is reflected in the Housing Sites Inventory (HIS) of the HE, which lists both vacant and underutilized properties bearing land use and zoning designations that allow for new housing at appropriate densities. The vast majority of these properties are located in urbanized, transit-served areas, consistent with the smart growth policies of the ECAE.

Both the HE and the ECAE establish goals and policies that promote smart growth as a means of providing for the housing and employment needs of residents while minimizing environmental impacts. As summarized below, policies in both elements provide for efficient land use, multi-modal transportation options, preservation of natural resources, and energy efficiency, all of which contribute to reducing the City's carbon footprint.

The ECAE echoes many of the goals and policies of the HE:

- Encourage renewable energy and energy efficiency features in new housing developments, such as PV systems, energy efficient lighting, cogeneration heating and energy facilities, and retrofitting existing housing with energy efficient devices.

- Encourage transit-oriented development within the City's SGOAs.

- Encourage the use of alternative transportation as a means to reduce air pollution and GHG emissions.

- Support innovative ways to meet housing needs, including adaptive reuse of existing non-residential buildings and underutilized commercial sites.

- Encourage energy efficiency and conservation through LEED-certified ZNE development.

9.1.4 Community Facilities Element (CFE)

The CFE addresses the community's need for public services and facilities, with the fundamental goal of ensuring that such services and facilities keep pace with the City's growing population. While the CFE is now somewhat outmoded (prepared in 1990 and has never been updated), the services and facilities it addresses – public safety, recreational amenities, public schools, water and sewer utilities, stormwater systems, etc. – remain as important to quality of life today as they were nearly 30 years ago. Like the ECAE, the CFE encourages a sustainable approach to the provision of public services and facilities, including thorough review of the social, economic, and environmental factors that contribute to demand for such services and facilities.

- Promote compact infill development that allows for cost-effective provision of public services and facilities.
- Promote the preservation of open space and enhance the visual character of the City.
- Encourage expansion of bicycle routes throughout the City, as well as a comprehensive networks of sidewalks, pathways, and trails.
- Encourage pedestrian and bicycle accessibility when siting and designing public schools and other public facilities.
- Promote the preservation of natural landforms and the maximum use of natural drainage courses, as well as vegetative measures to protect and stabilize land areas.
- Encourage water conservation and programs that educate the community about its importance.

9.1.5 Environmental Resources Management Element (ERME)

The ERME is designed to conserve natural resources and open space. The ERME calls for comprehensive assessment of the City's natural resources as part of the effort to identify and mitigate the environmental impacts of new development on eco-systems and geologic assets. Like the ECAE, the ERME promotes planned management, wise utilization, and preservation of natural resources to ensure the health, safety, and welfare of both present and future generations.

- Reduce dependence on imported water.
- Promote interagency coordination on air quality improvement.
- Discourage the development of agricultural land that can still be economically cultivated as part of the effort to minimize the extension of public services.
- Align with GHG emissions reduction measures in the CAP that support the preservation of agricultural resources through conservation easements, carbon-farming, and the expansion of local food sourcing operations.

9.1.6 Public Safety Element (PSE)

The PSE identifies risks associated with geologic hazards, flooding, and wildfire. Adopted in 1975, the PSE does not directly acknowledge climate change and its potential to increase the City's exposure to both natural and human-induced hazards. However, the element does speak to the need for civil disaster preparedness through coordinated emergency operations, which are essential to mitigating the immediate impacts of climate-induced phenomena like extreme rainfall, coastal storm surge, and wildfire.

SB 379 Jackson requires that all cities and counties update their safety elements before January 1, 2022 to include assessment of the risks associated with climate change impacts. Updating the PSE to address climate change impacts is a logical next step following the adoption of the ECAE and CAP. With respect to the EDE, an update of the PSE provides an opportunity to address the potential impacts of climate change on the local economy and the City's efforts to expand its employment base and promote a business-friendly environment.

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CHAPTER 10

THEMES, GOALS, AND POLICIES

RENEWABLE ENERGY AND ENERGY EFFICIENCY	
GOAL ECAE-1a:	**THE OCEANSIDE COMMUNITY WILL SIGNIFICANTLY REDUCE ITS DEPENDENCE ON FOSSIL FUELS.**
Policy ECAE-1a-1:	Incentivize the installation of solar photovoltaic systems in existing development, through community outreach and education, permit streamlining, and support of creative financing programs.
Policy ECAE-1a-2:	Require that new development supply a portion of its energy demand through renewable sources, to the extent practical and financially feasible.
Policy ECAE-1a-3:	Continue to pursue the expansion of solar photo-voltaic systems in municipal facilities, to both reduce the carbon footprint of municipal operations and achieve long-term cost savings.
Policy ECAE-1a-4:	Continue to explore Community Choice Aggregation (CCA) as a means of sourcing utility-scale renewable energy.
Policy ECAE-1a-5:	Explore opportunities for district heating/energy facilities, including cogeneration systems, central solar heating, and the use of local biomass as a fuel source.
Policy ECAE-1a-6:	Collaborate with MCB Camp Pendleton to identify opportunities for utility-scale renewable energy facilities.
Policy ECAE-1a-7:	Allow for renewable energy storage facilities in appropriate locations, as technological advances and market conditions enhance the viability of renewable energy storage.
Policy ECAE-1a-8:	Continue to oppose offshore petroleum extraction and related onshore facilities.
Policy ECAE-1a-9:	Ensure that land use and development standards allow for wind energy generation facilities while protecting aesthetic resources, neighborhood character, and the City's overall visual quality.
Policy ECAE-1a-10:	Remain open to sourcing energy from biomass, hydropower, hydrogen, nuclear fission and other alternatives to fossil fuel, while advocating for the responsible use, containment, reprocessing, and disposal of waste material.
Policy ECAE-1a-11:	Remain open to tidal and wave energy harvesting as a potential clean energy source, while being mindful of potential impacts on marine biology, aesthetic resources, and maritime navigation.
Policy ECAE-1a-12:	Participate in state and regional efforts to promote alternative fuels (e.g., biodiesel, bioalcohol, chemically stored electricity, biomass), to the extent practical and financially feasible.
GOAL ECAE-1b:	**THE CITY WILL ENCOURAGE EFFICIENCY AND CONSERVATION IN EXISTING DEVELOPMENT.**
Policy ECAE-1b-1:	Incentivize energy efficiency retrofitting of existing development through community outreach and education, disclosure and benchmarking requirements, permit streamlining, creative financing programs, and regional partnerships.
Policy ECAE-1b-2:	Utilize data gathered through energy use disclosure and benchmarking to inform outreach efforts and incentive programs.
Policy ECAE-1b-3:	In dedicating resources to energy efficiency and conservation in the residential sector, prioritize lower-income households that may lack the financial means to invest in retrofitting and/or other means of reducing energy use.
Policy ECAE-1b-4:	Assist lower-income households in accessing financial incentives for energy efficiency and renewable power upgrades.

Policy ECAE-1b-5:	Prepare outreach and educational materials for homeowners, business owners, and construction professionals that highlight opportunities for energy efficiency and conservation in conjunction with the renovation and expansion of existing development.
Policy ECAE-1b-6:	Encourage cogeneration/trigeneration in large-scale industrial facilities, to the extent practical and financially feasible.
GOAL ECAE-1c:	**THE CITY WILL ENCOURAGE ENERGY EFFICIENCY AND CONSERVATION IN NEW DEVELOPMENT.**
Policy ECAE-1c-1:	Explore possible incentives for LEED-certified and zero net energy (ZNE) development, including permit streamlining and fee reductions or waivers.
Policy ECAE-1c-2:	Encourage passive solar building design in new development.
Policy ECAE-1c-3:	Develop outreach and educational materials promoting energy efficiency and conservation that can be distributed to new homeowners and new businesses at point of sale.
Policy ECAE-1c-4:	Establish an ongoing dialogue with commercial and industrial brokers and property management entities to promote the benefits of energy efficiency and conservation.
Policy ECAE-1c-5:	Explore the possibility of establishing "reach" codes that promote energy efficiency beyond the requirements of the CALGreen Building Code.
Policy ECAE-1c-6:	Provide forums through which LEED-certified and Zero Net Energy (ZNE) development can be acknowledged and celebrated.
Policy ECAE-1c-7:	As an alternative to natural gas, encourage building electrification, including electric heat pump appliances, space heaters, and water heaters.
Policy ECAE-1c-8:	Encourage the development community to pursue financial incentives for energy efficiency offered by San Diego Gas and Electric (SDG&E).
GOAL ECAE-1d:	**THE CITY WILL PROMOTE AWARENESS OF THE EMBODIED ENERGY IN CONSTRUCTION MATERIALS AND ENCOURAGE THE USE OF MATERIALS WITH LOWER EMBODIED ENERGY.**
Policy ECAE-1d-1:	Support state and/or federal efforts to develop life cycle carbon accounting frameworks for analyzing carbon emissions from building construction.
Policy ECAE-1d-2:	Prepare outreach and educational materials for homeowners, business owners, and construction professionals that identify the embodied energy in commonly-used construction materials.
Policy ECAE-1d-3:	Encourage the use of locally-produced construction materials, including salvaged lumber.
GOAL ECAE-1e:	**THE CITY WILL BE A WELCOMING AND SUPPORTIVE ENVIRONMENT FOR GREEN BUSINESS.**
Policy ECAE-1e-1:	Recruit businesses in "cleantech" and other green sectors, with emphasis on new firms that can supply and service Oceanside homeowners and businesses.
Policy ECAE-1e-2:	To encourage domestic production of consumer goods, amend land use policies and zoning standards to allow for small-scale, low-intensity manufacturing in commercial zoning districts.
Policy ECAE-1e-3:	Work with MCB Camp Pendleton to identify opportunities for utility-scale renewable energy facilities.
Policy ECAE-1e-4:	Consider ways to brand Oceanside as a green community.
Policy ECAE-1e-5:	Participate in regional efforts to develop renewable energy storage facilities.

SMART GROWTH AND MULTIMODAL TRANSPORTATION	
GOAL ECAE-2a:	**THE CITY WILL ACCOMMODATE FUTURE POPULATION, EMPLOYMENT, AND HOUSING GROWTH WITHIN ALREADY URBANIZED AREAS.**
Policy ECAE-2a-1:	In areas served by transit, promote land use intensities that increase transit ridership and, in turn, the quality and frequency of transit service.
Policy ECAE-2a-2:	In the City's commercial corridors, promote a mix of land uses that contributes to a sense of place, creates synergies between local businesses, and affords residents the opportunity to live, work, and play within a walkable radius.
Policy ECAE-2a-3:	Develop parking standards and programs that ensure the efficient use of both public and private parking facilities.
Policy ECAE-2a-4:	Streamline the review and approval process for transit-oriented development within the City's designated Smart Growth Opportunity Areas.
Policy ECAE-2a-5:	Explore opportunities to implement "mobility hub" features within Smart Growth Opportunity Areas and other areas amenable to active transportation and shared mobility options.
Policy ECAE-2a-6:	Work with the development community to identify new sources of financing for mixed-use and other forms of urbanized development, including the implementation of the El Corazon Specific Plan.
Policy ECAE-2a-7:	Where appropriate, encourage the repurposing of declining strip commercial centers into mixed-use communities or other uses that continue to provide essential commercial goods and services while affording new housing options for current and future residents.
Policy ECAE-2a-8:	Prioritize capital improvements in areas suitable for mixed-use development.
Policy ECAE-2a-9:	Pursue regional, state, and federal grant funding that incentivizes mixed use development.
GOAL ECAE-2b:	**THE CITY WILL PRESERVE AND ENHANCE NATURAL HABITAT, PARKLAND, AND OTHER OPEN SPACE THAT CONTRIBUTES TO ENVIRONMENTAL HEALTH AND QUALITY OF LIFE.**
Policy ECAE-2b-1:	Update the Environmental Resources Management Element to incorporate economically feasible habitat conservation policies and actions consistent with the goals and objectives of the North County Multiple Habitat Conservation Program (MHCP).
Policy ECAE-2b-2:	In conjunction with infill and redevelopment projects, pursue opportunities to integrate public open space into the City's urbanized corridors.
Policy ECAE-2b-3:	Maintain the health and visual quality of the City's watersheds and support the siting of public amenities and gathering spaces in proximity to these important natural resources.
GOAL ECAE-2c:	**THE CITY WILL CONTINUE TO EXPAND ITS ACTIVE TRANSPORTATION NETWORK.**
Policy ECAE-2c-1:	Pursue grant funding and other resources for implementation of the priority projects identified in the City's Pedestrian Master Plan and Bicycle Master Plan.
Policy ECAE-2c-2:	Continue to prioritize and pursue grant funding for Safe Routes to School.
Policy ECAE-2c-3:	Support SANDAG's efforts to implement the Inland Rail Trail.
Policy ECAE-2c-4:	Ensure that capital improvements are consistent with the City's Complete Streets policies, as articulated in the Circulation Element.

Policy ECAE-2c-5:	Implement the right-of-way improvements recommended in the Coast Highway Vision and Strategic Plan.
Policy ECAE-2c-6:	Where appropriate, implement "complete street" right-of-way improvements such as those recommended in the Coast Highway Vision and Strategic Plan.
GOAL ECAE-2d:	**THE CITY WILL ACTIVELY SEEK REGIONAL TRANSPORTATION FUNDING FOR PROJECTS THAT EXPAND MOBILITY OPTIONS FOR THE OCEANSIDE COMMUNITY.**
Policy ECAE-2d-1:	Participate actively in the development of the Regional Transportation Improvement Plan (RTIP).
Policy ECAE-2d-2:	Pursue TransNet funding for active transportation infrastructure.
Policy ECAE-2d-3:	Consider partnerships with NCTD and adjacent cities to enhance eligibility for grant funding.
GOAL ECAE-2e:	**BY 2035, AT LEAST TEN PERCENT OF OCEANSIDE RESIDENTS WILL COMMUTE TO WORK BY PUBLIC TRANSIT.**
Policy ECAE-2e-1:	Collaborate with the North County Transit District (NCTD) to address "first mile/last mile" challenges faced by prospective transit users.
Policy ECAE-2e-2:	Actively support efforts to double-track the entire Los Angeles-San DiegoSan Luis Obispo (LOSSAN) rail corridor.
Policy ECAE-2e-3:	Encourage the electrification of the Sprinter line.
Policy ECAE-2e-4:	Through TDM programs and other means, encourage employers to participate in regional rideshare programs, including SANDAG's iCommute.
Policy ECAE-2e-5:	Collaborate with NCTD to identify areas with the greatest demand for expanded bus service.
GOAL ECAE-2f:	**BY 2035, ZERO EMISSION VEHICLES (ZEVs) WILL COMPRISE AT LEAST 20 PERCENT OF AUTOMOBILES OWNED AND OPERATED BY OCEANSIDE RESIDENTS.**
Policy ECAE-2f-1:	Promote the installation of public electric vehicle charging facilities at convenient locations throughout the City.
Policy ECAE-2f-2:	Explore incentives for electric vehicle charging facilities in multi-family developments.
Policy ECAE-2f-3:	In partnership with the local business community, San Diego Gas and Electric, and other stakeholders, explore ways to reduce the cost of electric and other zero emission vehicles to Oceanside residents, specifically low-income households in proximity to air quality hotspots near I-5 and state highways.
Policy ECAE-2f-4:	Conduct public outreach and education on the benefits of electric and other zero emission vehicles.
Policy ECAE-2f-5:	Recruit and support businesses advancing ZEV technology and rendering ZEVs more accessible to Oceanside residents.
Policy ECAE-2f-6:	Continue to streamline the permit review and approval process for electric vehicle charging facilities on private property.
Policy ECAE-2f-7:	Transition the municipal vehicle fleet to electric and other zero emission vehicles, to the extent feasible.
Policy ECAE-2f-8:	Consider ways to reduce vehicle idling, particularly in proximity to schools and other sensitive receptors.

ZERO WASTE	
GOAL ECAE-3a:	**THE CITY WILL ACHIEVE 75 PERCENT TO 90 PERCENT WASTE DIVERSION BY 2020.**
Policy ECAE-3a-1:	Reaffirm the City's commitment to its 2010 Zero Waste Resolution by reintroducing the resolution to the City Council and identifying new opportunities for, as well as new constraints upon, the City's waste reduction and diversion efforts since the resolution's adoption.
Policy ECAE-3a-2:	Continue to enhance organics waste recycling opportunities for both the commercial and residential sector in accordance with the City's Zero Waste goals, and State Organics mandates.
Policy ECAE-3a-3:	Continue to support and expand community composting programs including but not limited to backyard composting, community garden composting, school on-site composting, and multi-family composting initiatives.
Policy ECAE-3a-4:	Reduce residential agricultural food waste by developing and implementing community gleaning initiatives to capture and repurpose surplus food for food insecure communities.
Policy ECAE-3a-5:	Continue to develop the City's Organics Waste-to-Energy Biosolids Masterplan and implement programs, infrastructure, and services that will help the City maximize the potential of beneficial reuse and renewable energy generation from organic waste.
Policy ECAE-3a-6:	Continue to support community zero waste programs that manage resources for their highest and best use through source reduction, reuse, recycling, composting, and redesign.
Policy ECAE-3a-7:	Adopt an Extended Producer Responsibility (EPR) resolution to guide product stewardship and EPR policies and programs for difficult to recycle materials.
Policy ECAE-3a-8:	Continue to expand the Green Oceanside Business Network and the number of local businesses completing the City's Sustainability Scorecard.
Policy ECAE-3a-9:	Continue to expand the City's Green Oceanside educational sustainability initiative to include additional interactive opportunities through the Green Oceanside mobile app, through expanded staffing of the Green Oceanside booth and other avenues.
Policy ECAE-3a-10:	Continue to support the City's Green Oceanside Unified Environmental Compliance Inspection Team and its efforts to provide service evaluations, technical assistance, and other resources to local businesses.
Policy ECAE-3a-11:	Coordinate with the City's waste management contractor to ensure that rate structures, waste cart options, and other policies and programs are promoting waste reduction and recycling to the fullest extent possible.
Policy ECAE-3a-12:	Continue to develop and disseminate outreach and educational materials that assist residents and business owners in understanding the scope of California's Single-Use Carryout Bag Ban (SB 270) and what more they can do to reduce disposable plastics waste.
Policy ECAE-3a-13:	Engage local dry cleaning operations to explore alternatives to disposable plastic sheeting as a means of protecting dry cleaned materials.
Policy ECAE-3a-14:	Improve monitoring and enforcement of the City's construction waste diversion requirements.

GOAL ECAE-3b:	**THE CITY WILL COMPLY WITH THE STATE'S GOALS FOR REDUCTION IN DISPOSED ORGANIC WASTE (50 PERCENT BY 2020 AND 75 PERCENT BY 2025).**
Policy ECAE-3b-1:	Ensure compliance with SB 1383 and associated requirements for organics recycling in all sectors.
Policy ECAE-3b-2:	Implement food recovery programs to meet the State's goal of 20% edible food waste reduction by 2025.
Policy ECAE-3b-3:	Continue to develop and disseminate outreach and educational materials and provide educational public presentations that provide residents and business owners with strategies to reduce food waste through better menu planning, purchasing habits, zero waste culinary training, and inventory control.
Policy ECAE-3b-4:	Continue to develop and enhance opportunities for food donation and food recovery to feed food insecure populations through partnerships and service opportunities between government agencies, and private and non-profit partners, as a means to minimize edible food waste.
Policy ECAE-3b-5:	Continue to develop and enhance opportunities for animal feed programs to ensure the highest and best use of resources prior to food waste recycling or landfilling.
Policy ECAE-3b-6:	Promote "farm-to-table-to-farm" practices that encourage local food sourcing and containment of the local organic waste stream.
Policy ECAE-3b-7:	Continue to develop the El Corazon Food Recovery and Culinary Arts Training Facility. Facility operations, culinary arts training program, and meal/catering food product will be developed and implemented with the focus on sustainability, zero waste, and food recovery.
GOAL ECAE-3c:	**IN LIGHT OF LIMITATIONS ON THE AMOUNT OF RECYCLABLE MATERIAL THAT CAN BE EXPORTED FOR PROCESSING, THE CITY WILL CONTINUE TO PROMOTE A CULTURE OF SUSTAINAIBLE MATERIALS MANAGEMENT AMONG RESIDENTS, BUSINESS OWNERS, AND OTHER LOCAL STAKEHOLDERS.**
Policy ECAE-3c-1:	To reduce contamination of recyclable waste, continue to develop and disseminate outreach and educational materials about to how to properly sort and separate commingled recyclables from organics recyclables, household hazardous waste and landfill materials, to ensure resources maintain value are properly managed.
Policy ECAE-3c-2:	Continue to implement the District Wide Zero Waste School's Initiative, working with the Oceanside Unified School District to achieve their 75% recycling goals by 2020, and supporting the establishment of higher recycling/zero waste goals post 2020.
Policy ECAE-3c-3:	Educate residents and business owners on ways to reduce the amount of junk mail and/or excess packaging they receive.
Policy ECAE-3c-4:	Advocate for statewide policy for sustainable packaging materials management.
Policy ECAE-3c-5:	Prohibit the use of polystyrene and other single-use plastics in local restaurant food packaging, and pursue a straws-upon-request campaign or policy.
Policy ECAE-3c-6:	Continue to support and expand reuse collaboratives and partnerships through the City's Curb Up program, and enhance existing services to provide curbside textile, small and large item donation services to residents.

WATER CONSERVATION	
GOAL ECAE-4a:	THE CITY WILL BE AMONG THE MOST WATER EFFICIENT LOCAL JURISDICTIONS IN THE SAN DIEGO REGION.
Policy ECAE-4a-1:	Continue to support WaterSmart Analytics and other programs that assist residents and business owners in conserving water.
Policy ECAE-4a-2:	Continue to work with the State to shape the framework for long-term water use efficiency through Executive Order B-37-16, which calls for eliminating water waste, achieving drought resilience, increasing efficiency in agricultural water use, and establishing water use and water loss targets.
Policy ECAE-4a-3:	Enforce mandatory water use efficiency measures and State prohibitions on wasteful water use practices.
Policy ECAE-4a-4:	Encourage a watershed approach to low water use and sustainable landscaping practices through education on climate, soil, plants, water efficiency, irrigation, and design.
Policy ECAE-4a-5:	Further reinforce water efficiency through market-based rebates, results oriented programs, contests designed to reinforce and promote water efficient lifestyles, and other incentives designed to encourage and empower residents and businesses to reduce their water footprint.
Policy ECAE-4a-6:	Continue to leverage funding from the San Diego County Water Authority, Metropolitan Water District, San Diego Gas and Electric, and other state and regional agencies to subsidize local water conservation efforts.
Policy ECAE-4a-7:	Leverage the collective buying power of the Oceanside community to pursue discounts for local residents and businesses on water efficiency products, low-water landscaping, water use audits, and other goods and services that promote water conservation.
Policy ECAE-4a-8:	Seek out partnerships with industry leaders as well as local businesses to participate in cost-share ventures that might include water efficiency services, products, installations, and training.
Policy ECAE-4a-9:	Maintain a water rate structure that promotes water use efficiency.
Policy ECAE-4a-10:	Promote the expansion of the City's tree canopy, on both private property and within the public right-of-way, as means of reducing stormwater runoff, evapotranspiration, heat gain, and other phenomena that impact water supply and demand.
Policy ECAE-4a-11:	Develop a Pure Water Oceanside advanced water treatment system to create a new, local source of high-quality, drought-proof, and environmentally sound. Pure Water Oceanside will increase local, sustainable water supplies, improve groundwater quality, and enhance resiliency through drought and climate change, producing enough water to serve one fourth of Oceanside's residential customers each day.
GOAL ECAE-4b:	THE CITY WILL LOCALLY SOURCE 50 PERCENT OF ITS TOTAL POTABLE WATER DEMAND BY 2050.
Policy ECAE-4b-1:	Continue to expand the harvesting of local groundwater, with emphasis on renewable energy sources to power groundwater recovery and treatment.
Policy ECAE-4b-2:	Facilitate groundwater recharge through an IPR project.
Policy ECAE-4b-3:	Continue to explore opportunities for cost-effective, low-impact harvesting and processing of seawater for potable use.

URBAN GREENING	
GOAL ECAE-5a:	**BY 2035, THE CITY WILL EXPAND ITS TREE CANOPY TO AT LEAST 25 PERCENT COVERAGE CITYWIDE.**
Policy ECAE-5a-1:	Prepare an urban forestry plan that includes a complete inventory of the City's street trees.
Policy ECAE-5a-2:	Update the City's Street Tree Ordinance to require one-to-one replacement of trees removed from the public right-of-way, parkways, and other public spaces.
Policy ECAE-5a-3:	Collaborate with local and regional tree advocacy groups to sponsor awareness campaigns and stewardship efforts.
Policy ECAE-5a-4:	Consider a tree replacement requirement and/or an in-lieu fee to mitigate for mature trees lost to new development.
Policy ECAE-5a-5:	Pursue opportunities to increase the tree canopy on City-owned properties, including parks.
Policy ECAE-5a-6:	Prioritize street tree planting in lower-income neighborhoods.
Policy ECAE-5a-7:	Encourage new development to incorporate shade trees, to the extent practical and financially feasible.
GOAL ECAE-5b:	**THE CITY WILL INCREASE PERMEABLE AND PLANTED SURFACE WITHIN DEVELOPED AREAS.**
Policy ECAE-5b-1:	Integrate green infrastructure (i.e., natural areas that provide habitat, flood protection, stormwater filtration, and improved air quality) into capital improvement projects, to the extent feasible and appropriate.
Policy ECAE-5b-2:	Replace concrete and asphalt surfaces in the public right-of-way with permeable paving, to the extent feasible and appropriate.
Policy ECAE-5b-3:	In coordination with adjacent private property owners, identify hardscaped spaces within the public right-of-way that can be rendered permeable and plantable.
GOAL ECAE-5c:	**IN THE DEVELOPMENT REVIEW PROCESS, THE CITY WILL CONTINUE TO RECOGNIZE LANDSCAPE AS AN INTEGRAL COMPONENT OF SITE DESIGN.**
Policy ECAE-5c-1:	Ensure that what qualifies as "landscape" in the City's governing documents includes plantable area and plant material capable of sequestering atmospheric carbon.
Policy ECAE-5c-2:	Develop a policy and/or zoning standards that clarify the review and approval process for modifications to approved landscape plans.
AGRICULTURE	
GOAL ECAE-6a:	**THE CITY WILL PRESERVE LOCAL AGRICULTURE AS A MEANS OF ENCOURAGING EFFICIENT LAND USE PATTERNS, LIMITING TRANSPORTATION-RELATED GHG EMISSIONS, SUPPORTING LOCAL FOOD SOURCING, AND MAINTAINING ECOLOGICAL BALANCE.**
Policy ECAE-6a-1:	Collaborate with local farmers to prepare agricultural easement grant applications to the Sustainable Agricultural Lands Conservation Program (SALC).
Policy ECAE-6a-2:	Support agritourism as an additional means of revenue generation for local farmers, thereby enhancing the economic sustainability of local agriculture.
Policy ECAE-6a-3:	Direct future housing and employment growth to the City's urban areas.
Policy ECAE-6a-4:	Provide recycled water for irrigation in South Morro Hills.

Policy ECAE-6a-5:	Explore ways to reduce the cost of water for agricultural use.
Policy ECAE-6a-6:	Evaluate agricultural zoning standards to ensure an expeditious review and approval process for farming operations and related facilities.
GOAL ECAE-6b:	**THE CITY WILL BE A FRIENDLY ENVIORNMENT FOR URBAN AGRICULTURE.**
Policy ECAE-6b-1:	Adopt an Urban Agriculture Incentive Zone (UAIZ) that would encourage farming as an interim use on vacant residential and commercial properties.
Policy ECAE-6b-2:	Amend home occupation standards to allow for non-resident workers in support of horticultural operations in residential zoning districts.
Policy ECAE-6b-3:	Prioritize community gardens and urban agriculture operations in areas with limited access to fresh food.
GOAL ECAE-6c:	**THE CITY'S AGRICULTURAL COMMUNITY WILL REDUCE FARMING-RELATED GHG EMISSIONS THROUGH IMPROVED SOIL MANAGEMENT.**
Policy ECAE-6c-1:	Encourage soil management practices that sequester atmospheric carbon (i.e., carbon farming).
Policy ECAE-6c-2:	Consider opportunities to mitigate GHG emissions associated with new development through agricultural soil management programs.
SUSTAINABLE CONSUMPTION	
GOAL ECAE-7a:	**THE OCEANSIDE COMMUNITY WILL BECOME INCREASINGLY AWARE OF THE ROLE CONSUMER CHOICE PLAYS IN CLIMATE CHANGE AND OTHER ENVIRONMENTAL IMPACTS.**
Policy ECAE-7a-1:	Raise awareness of sustainable goods and services through Green Oceanside and other outreach and education programs.
Policy ECAE-7a-2:	Conduct "shop local" and "shop small" campaigns that educate local consumers on the environmental benefits of patronizing local businesses.
Policy ECAE-7a-3:	Develop marketing programs and materials that encourage residents, business owners, workers, and visitors to purchase locally-produced food.
Policy ECAE-7a-4:	Develop marketing programs and materials that encourage residents, business owners, workers, and visitors to utilize reusable, recyclable, and/or compostable packaging.
GOAL ECAE-7b:	**THE OCEANSIDE COMMUNITY WILL BECOME INCREASINGLY AWARE OF THE LINKAGE BETWEEN SUSTAINABLE CONSUMPTION AND PUBLIC HEALTH.**
Policy ECAE-7b-1:	In collaboration with local schools and community groups, develop marketing programs and materials that highlight the health benefits of fresh, plant-based, minimally-processed food.
Policy ECAE-7b-2:	Showcase local businesses that provide healthy food options.
GOAL ECAE-7c:	**THE OCEANSIDE COMMUNITY WILL HAVE INCREASINGLY GREATER ACCESS TO SUSTAINABLE GOODS AND SERVICES.**
Policy ECAE-7c-1:	Utilize SANDAG's Healthy Communities Assessment Tool or a similar protocol to evaluate the availability of healthy food options across the City and report findings to decision-makers.
Policy ECAE-7c-2:	Encourage local businesses to provide healthy food and other sustainable goods and services through the Oceanside Green Business Network and other programs.

Policy ECAE-7c-3:	As part of the business licensing process, query local retailers and service providers on their efforts to procure and market sustainable goods and services.
Policy ECAE-7c-4:	Recruit businesses that provide healthy food and other sustainable goods and services.
Policy ECAE-7c-5:	Promote symbiotic relationships between the local agricultural community, local food processing operations, and local retailers.
GOAL ECAE-7d:	**IN MUNICIPAL OPERATIONS, THE CITY WILL EXEMPLIFY SUSTAINABLE PURCHASING PRACTICES.**
Policy ECAE-7d-1:	Continue to observe Administrative Directive AD-57, which calls for the purchase of environmentally preferred products and services whenever possible.
Policy ECAE-7d-2:	Continue to pursue grant funding for energy efficiency and renewable energy retrofitting of municipal facilities.
Policy ECAE-7d-3:	Continue to observe Administrative Directive AD-36, which calls for a 100 percent clean-and-green vehicle fleet.

CHAPTER 11

IMPLEMENTATION

11.1 Implementation

Implementation of the ECAE falls within the purview of a variety of City disciplines, including: Development Services, Water Utilities, Public Works, and Neighborhood Services. These and other City disciplines will periodically convene as an ECAE Implementation Committee to delegate implementation tasks, monitor the status of implementation, and provide direction and resources as needed.

Policies related to **energy efficiency and renewable energy** will be implemented through code amendments, incentive programs, capital improvement projects, and public outreach activities. Implementation of these policies will require coordination with SANDAG, SDG&E, neighboring jurisdictions, the real estate industry, the Chamber of Commerce, and other local and regional stakeholders.

Policies related to **smart growth and multimodal transportation** will be implemented through planning efforts, code amendments, incentive programs, and capital improvement projects. Implementation of these policies will require coordination with SANDAG, NCTD, CalTrans, federal and state wildlife agencies, the development community, neighboring jurisdictions, and other local and regional stakeholders. Staff will pursue grant opportunities to provide funding for planning efforts and capital improvements that facilitate smart growth and the expansion of viable transportation options.

Policies related to **solid waste management (zero waste)** will be implemented through City programs and capital improvement projects. Implementation of these policies will require coordination with Waste Management of North County, CalRecycle, the local business community, local school districts, and other local and regional stakeholders. Public outreach will be an important component of the implementation effort.

Policies related to **water conservation** will be implemented through City programs and capital improvements projects. Implementation of these policies will require coordination with the California State Water Resources Control Board, state and regional water authorities, consultants, neighborhood jurisdictions, and other local and regional stakeholders. Public outreach will be an important component of the implementation effort.

Policies related to **urban greening** will be implemented through planning efforts, code amendments, incentive programs, and City operations, including ongoing street tree installation and maintenance. Implementation of these policies will require coordination with local property owners, consultants, local and regional advocacy groups, and other local and regional stakeholders.

Policies related to **local agriculture** will be implemented through planning efforts, code amendments, incentive programs, and pilot projects. Implementation of these policies will require coordination with the local farming community, the San Diego County Farm Bureau, the California Department of Food and Agriculture, and other local and regional stakeholders.

Policies related to **sustainable consumption** will be implemented through City programs, with considerable focus on public outreach and education. Implementation of these policies will require coordination with the business community, local school districts, local advocacy groups, and other local and regional stakeholders.

Each ECAE policy has been placed into one of four categories to indicate the staffing commitment necessary for effective implementation.

- **Aspirational/Opportunistic** – Policies will be implemented as circumstances allow.
- **Current Staffing Commitment** – Policies will be implemented in conjunction with existing City protocols and programs.
- **Initial New Staffing Commitment** – Policies will be implemented through one-time efforts (e.g., the preparation and adoption of new ordinances).
- **Ongoing New Staffing Commitment** – Policies will require ongoing staff effort over the long term.

Each policy is color-coded to indicate its associated ECAE theme, as follows:

Energy Efficiency and Renewable Energy

Land Use and Transportation

Solid Waste Management (Zero Waste)

Water Conservation

Urban Greening

Agriculture

Sustainable Consumption

ASPIRATIONAL/OPPORTUNISTIC			
Policy 1a-5	Policy 1d-3	Policy 2c-3	Policy 4a-11
Policy 1a-6	Policy 1e-3	Policy 2d-3	Policy 5a-3
Policy 1a-10	Policy 1e-5	Policy 2e-2	Policy 5a-5
Policy 1a-11	Policy 2a-1	Policy 2e-3	Policy 6a-1
Policy 1a-12	Policy 2a-2	Policy 2e-5	Policy 6a-5
Policy 1b-6	Policy 2a-6	Policy 2f-8	Policy 6c-1
Policy 1c-5	Policy 2a-7	Policy 3c-4	Policy 6c-2
Policy 1c-7	Policy 2a-9	Policy 4a-8	
Policy 1d-1	Policy 2b-2	Policy 4a-10	

CURRENT STAFFING COMMITMENT			
Policy 1a-3	Policy 2f-7	Policy 3b-4	Policy 4b-2
Policy 1a-4	Policy 3a-2	Policy 3b-5	Policy 4b-3
Policy 1a-8	Policy 3a-3	Policy 3b-6	Policy 6a-3
Policy 1e-1	Policy 3a-4	Policy 3b-7	Policy 7a-1
Policy 1e-4	Policy 3a-5	Policy 3c-1	Policy 7a-2
Policy 2b-3	Policy 3a-6	Policy 3c-2	Policy 7a-3
Policy 2c-1	Policy 3a-8	Policy 3c-6	Policy 7a-4
Policy 2c-2	Policy 3a-9	Policy 4a-1	Policy 7a-5
Policy 2c-4	Policy 3a-10	Policy 4a-2	Policy 7c-2
Policy 2c-5	Policy 3a-11	Policy 4a-3	Policy 7c-4
Policy 2c-6	Policy 3a-12	Policy 4a-5	Policy 7d-1
Policy 2d-1	Policy 3b-1	Policy 4a-6	Policy 7d-2
Policy 2d-2	Policy 3b-2	Policy 4a-9	Policy 7d-3
Policy 2f-6	Policy 3b-3	Policy 4b-1	

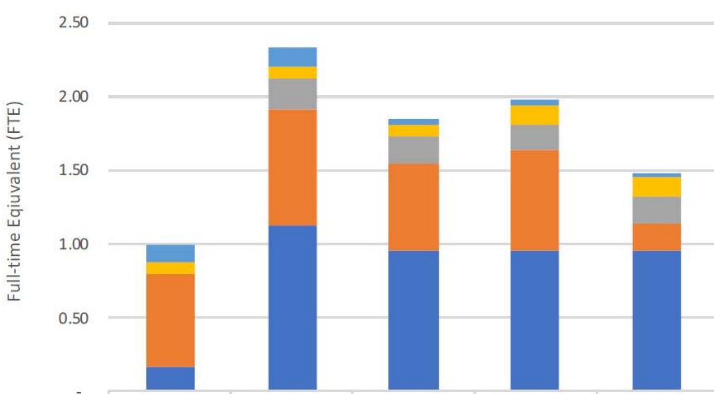
INITIAL NEW STAFFING COMMITMENT			
Policy 1a-2	Policy 2a-3	Policy 3c-5	Policy 6a-6
Policy 1a-7	Policy 2a-4	Policy 5a-2	Policy 6b-1
Policy 1a-9	Policy 2b-1	Policy 5a-4	Policy 6b-2
Policy 1c-1	Policy 2e-4	Policy 5a-7	Policy 7c-1
Policy 1c-2	Policy 3a-1	Policy 5c-1	
Policy 1d-2	Policy 3a-7	Policy 5c-2	
Policy 1e-2	Policy 3a-13	Policy 6a-2	

ONGOING NEW STAFFING COMMITMENT			
Policy 1a-1	Policy 1c-8	Policy 3a-14	Policy 5b-3
Policy 1b-1	Policy 2a-5	Policy 3c-3	Policy 6a-4
Policy 1b-2	Policy 2a-8	Policy 4a-4	Policy 6b-3
Policy 1b-3	Policy 2e-1	Policy 4a-7	Policy 7b-1
Policy 1b-4	Policy 2f-1	Policy 4a-12	Policy 7b-2
Policy 1b-5	Policy 2f-2	Policy 5a-1	Policy 7c-1
Policy 1c-3	Policy 2f-3	Policy 5a-6	Policy 7c-3
Policy 1c-4	Policy 2f-4	Policy 5b-1	Policy 7c-5
Policy 1c-6	Policy 2f-5	Policy 5b-2	

11.1.1 Implementation Cost Analysis

An analysis of the staff resources needed to effectively implement the CAP was conducted by the Energy Policy Initiatives Center (EPIC), a non-profit research and academic unit of the University of San Diego. The EPIC analysis concludes that the City will need to devote at least one full-time employee equivalent (FTE) in the first year of CAP implementation, as much as 2.3 FTE in the second year, with an average of 1.8 FTE needed for implementation in the third, four, and fifth years following CAP adoption. The necessary staffing resources over this five-year period will be provided by a number of City disciplines. Figure 17 below shows how staffing resources for CAP implementation will be allocated by Development Services, Water Utilities, Neighborhood Services, Economic Development, and Public Works.

Figure 17: Staffing Resources for CAP Implementation



	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23
Public Works	0.12	0.12	0.03	0.03	0.03
Neighborhood Services	0.08	0.08	0.08	0.13	0.13
Economic Development	-	0.22	0.19	0.18	0.18
Development Services	0.63	0.78	0.59	0.68	0.19
Water Utilities	0.18	1.13	0.96	0.96	0.96
Total	1.00	2.33	1.84	1.97	1.48

As indicated in Figure 17, Development Services and Water Utilities will provide the vast majority of staffing resources needed to implement the CAP, with Economic Development, Neighborhood Services, and Public Works supplying significantly smaller percentages of total staffing resources. Staffing needs are highest in the first two years of implementation due to the need to adopt new policies and ordinances addressing smart growth, TDM, solar PV, and other CAP priorities. Thereafter, staffing resources will be focused on implementation of CAP-related City programs (community gardens, public outreach, zero waste, and water conservation efforts).

CHAPTER 12

LOCAL CLIMATE ADAPTATION

12.1 Local Climate Adaptation

Climate change is a global phenomenon that has widespread impacts on human health and safety, economic communities, water supply, ecosystem function, and the provision of basic services. Climate change is currently affecting and will continue to affect the physical environment throughout California, the San Diego region, and the City of Oceanside. Climate adaptation involves strategies to minimize, prevent, and anticipate adverse effects of climate change. Communities with a climate adaptation plan can prevent and reduce negative environmental impacts, save resources, retain finances, and prevent loss of human life. The effects of climate change vary by location and the nature of the built environment. In efforts to reduce the City’s GHG emissions and react to the negative impacts related to climate change, the City understands that adaptation strategies need to be developed and implemented.

Based on the latest discoveries related to impacts from GHG emissions, San Diego’s Regional Planning Agency, known as SANDAG, has prepared adaptation efforts for reacting to climate change for local governments. SANDAG's Community-Based Organizations Working Group has provided information regarding the effects of climate change through the "White Papers" writings. SANDAG predicts that by the year 2050, the San Diego region will be susceptible to the effects of climate change through:

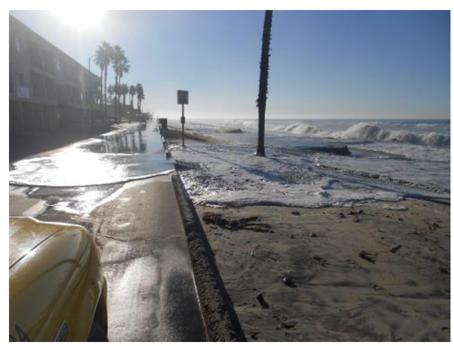
- 16 percent fewer rainy days;
- 8 percent increase of more rainfall during large rainstorms;
- 12 percent decrease in the runoff and streamflow due to less snowpack and greater evaporation;
- At least a 0.7 to 1.6 feet increase in sea-level rise;
- Longer wildfire events;
- Threats to habitats and animals; and
- Seven times as many days with extreme heat per year leading to decreased public health.

While the ECAE focuses on the need to reduce GHG emissions, it is essential that the City acknowledge the need to develop an adaptation plan for potential environmental impacts related to climate change.

In efforts to prepare for the potential climate change impacts, the City of Oceanside has identified several climate adaptation strategies based on the City's location, characteristics, and SANDAG’s planning efforts to reduce climate related risks and prepare for current and future impacts of climate change. The Vulnerability Assessment located within the City's draft Local Coastal Program Update (LCPU) identifies several impacts due to climate change and acknowledges that cities must prepare adaptation strategies to adapt and react to impacts. Several adaptation strategies have been developed based on the LCPU's Vulnerability Assessment and are incorporated into this chapter. The adaptation strategies developed in this chapter address sea level rise and associated coastal hazards, increased temperatures, wildfires, biodiversity/habitat, and drought and flooding. Each adaptation strategy focuses on protection and preparedness based on each impact. A description of each impact directly related to climate change and the adaptation strategies for each are described below.

12.2 Impacts Related to Sea Level Rise and Associated Coastal Hazards

The City of Oceanside is a unique coastal city because of its coastal amenities such as the approximately 1,950-foot long wooden pier, Small Craft Harbor, approximately 3-miles of coastal beaches, and the pedestrian and vehicle coastal path known as "The Strand." Oceanside's coastal area is unique to the region and is considered one of the gems of North County San Diego, which is why the City must develop strategies to protect and retain its coastal lands and everything associated within the coastal area.



Coastal flooding on the Strand

Many science-based sea-level rise methodologies for local governments in California have been provided by the Ocean Protection Council, which analyzes and assesses the risks associated with sea-level rise and future and existing developments. According to data collected at the La Jolla tide gauge from SANDAG, it is anticipated that the sea-level will increase at least 4.8 to 7.2 inches by 2030 and increase to an additional level of at least 8.4 to 14.4 inches by 2050. The result of sea-level rise could drastically damage Oceanside's coastal lands and private and public properties. The City of Oceanside's LCPU provides a map exhibit that shows the extent of coastal inundation associated with various sea-level rise scenarios. This map shows a majority of the City's coastal lands being inundated from sea-level rise coupled with high tides and/or 100-year storm events.

King Tide Event at Wisconsin Street

The vulnerability assessment within the LCPU establishes and focuses on strategies to prepare Oceanside with objectives to better prepare for sea-level rise and its consequences, such as coastal erosion, increased storm-wave run-up, beach loss, and slope failure on coastal bluff faces. Acknowledging that sea-level rise could impact the shorelines of Oceanside, the City has considered several adaptation strategies in reaction to the impacts, listed below.

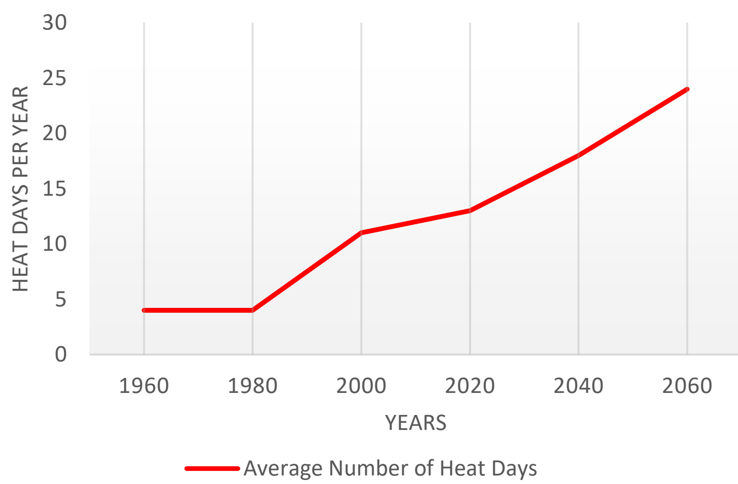
12.2.1 Potential Adaptation Strategies

- The City of Oceanside has teamed up with SANDAG to participate in the regional shoreline monitoring program, which measures coastal erosion and the changes in beach width over time. The benefits of the monitoring could establish the need for sand replenishment projects or programs.
- The City has been exploring the ideas of groins, jetties, and coastal reefs to assist in retaining beach sand on the shoreline.
- Provide the citizens of Oceanside with education regarding the risks associated with coastal erosion, storm surge events, tsunamis, and sea-level rise impacts.
- The City of Oceanside will implement and develop a Coastal Hazard Adaptation Plan within the LCP amendment to identify the effects of sea level rise over the future years and develop specific adaptation strategies to address the coastal impacts.
- Beach sand pumping and dredging of the Oceanside Small Craft Harbor mouth and possibly the Del Mar Camp Pendleton beaches. The City is in the process of establishing an opportunistic beach fill program that would identify construction projects that could export sandy material to the City’s beaches. The City will develop a program to enable developers to conduct monitoring, permitting, and hauling of their project sand to the beaches.

12.3 Impacts Related to Increased Temperatures

California has been experiencing higher temperatures or heat waves/days within periods from April to October, where the maximum temperatures exceed historical temperatures. Due to climate change, the number of heat days are expected to increase substantially by the year 2090. Heat waves can be defined as five or more consecutive extreme heat days. These events have been historically infrequent, but with the rise in climate change, the heat waves are becoming more prevalent and longer during the summer months. Temperatures can reach above 103.9° F or higher during these heat waves. The Scripps Institution of Oceanography at the University of California has discovered that San Diego experiences an average of two to four extreme heat days/heat waves per year. The Cal – Adapt Climate tools map shown below provides data that describes the increase in average heat days.

Figure 18: Number of Extreme Heat Days by Year



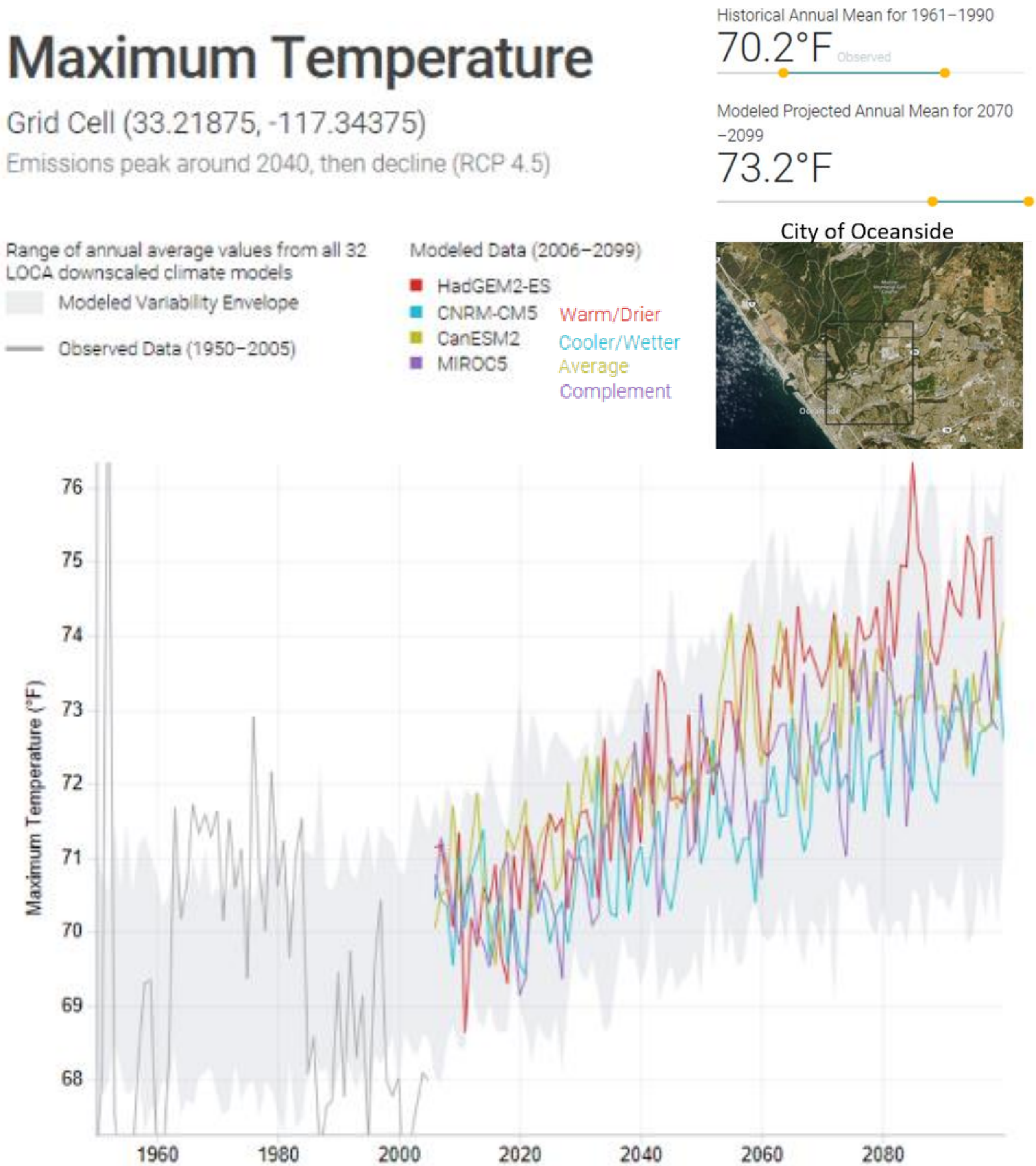
Source: Cal – Adapt Climate Tools, Heat Days per Year Graph, Figure 4

The City of Oceanside's historical average of extreme heat days and high temperatures (days over 70.2° F) has been increasing since the year 2000. By 2050, the number of extreme heat days could increase to an even higher rate. With the exception of a few odd years, the recorded historical duration of heatwaves in the City has been less than five days. By mid-century, the duration of heatwaves could increase to more than

10 days and up to 24 days by the end of the century. The average maximum temperatures for hot and cooler days could drastically increase by the end of the century. Currently, the City of Oceanside is experiencing average temperatures in the mid 70's for the warmer months and mid 60's in the cooler months. By the end of the century, the average warmer temperatures could increase up to the 80's and mid 70's for the cooler months. Figure 19, below, describes the increase in temperatures and shows how climate change is increasing the average temperatures for the City.

Per SANDAG White Paper Climate Change writings, SANDAG predicts that Oceanside temperatures could increase of up to 5° F and the City could experience up to at least 15 extreme heat days by the year 2050. These heat events have direct health impacts to the population. In response to the uprising temperatures and in order to safeguard the population for these extreme heat events, the City of Oceanside has developed several adaptation strategies, listed below.

Figure 19: Maximum Temperature in Oceanside due to Increasing Climate Change



Source: Cal - Adapt Climate Tools Figure 5

12.3.1 Adaptation Strategies

- Develop methods in association with SDG&E to develop clean energy for cooling buildings and reducing carbon footprints for homes, business, and civic institutions.
- Incorporate cooling strategies or development policies that would enable urban design that establishes cooling of buildings, and public and private spaces. Developing structures with a passive design that utilizes the environment to heat or cool buildings and reduce the need for mechanized power.
- Establish an urban forestry plan with tree canopy requirements to develop potential shade tree designated areas and landscaping to reduce the effects of heating and the urban island effect.
- Establish health care awareness and education to the public on the potential health risks of heat and warming temperatures.
- Improve parking lot shading and landscaping in new developments and promote planting of additional trees and landscaping within existing parking lots.
- Invest in renewable energy supply for the City.

12.4 Impacts Related to Wildfires

Wildfire in Loma Alta Creek 2017

Oceanside and the surrounding region have been experiencing an increase in wildfire events due to climate change. The terrain, vegetation, Santa Ana wind patterns, temperature increases, and decreased moisture due to longer periods of drought have contributed to the increase in wildfire activities. Oceanside's CAP identifies increase in the incidence of wildfires as one of the major impacts due to climate change. Oceanside has experienced many wildfires in the past decade, which supports that the increased temperatures, changes in precipitation patterns, and effects of climate change are becoming a direct contributor to fire impacts.

In addition to increased threats to the population and the City, the increased frequency of wildfires results in the release of harmful air pollutants into the atmosphere that can lead to respiratory health issues for residents.

12.4.1 Potential Adaptation Strategies

- Develop new and larger fire suppression zones to reduce impacts from fire threats and reduce emergency response cost. Map and identify locations that are at fire risk.
- Establish development regulations that would place urban development outside of potential fire zones.
- Educate the public on proper campfire usage to prevent potential fire impacts, the effects of air quality and health risks related to wildfires, and proper evacuation routes.
- Leverage the City's community Emergency Response team to integrate energy preparedness in case of wildfires.
- Promote the usage of fire-resistant building design, materials, and landscaping.
- Encourage the removal of eucalyptus and other plant species vulnerable to fire events.


El Salto Falls and Loma Alta Creek

12.5 Impacts Related to Biodiversity/ Habitat Hazards

The effects of climate change (i.e. wildfires, increased temperatures, sea-level rise, and drought) can drastically impact habitat and wildlife on land and within the sea. The change in precipitation patterns are disrupting the creation and sustainability of habitat areas and temporary bodies of water.

As a result, the habitat has become threatened and the ecosystem is either dying off or negatively impacted. The extreme heat waves and droughts can affect the growing cycle of vegetation. Listed below are the adaptation strategies the City of Oceanside has developed to ensure protection and reduce impact on the City's habitat.

12.5.1 Adaptation Strategies

- Map locations of existing native habitat areas and species to identify and protect native species and lands.
- Enforce the City of Oceanside's MHCP (Multiple Habitat Conservation Program) when reviewing potential

Buena Vista Lagoon

development proposals to preserve habitat and open space by directing forecasted growth into appropriate areas.

- Monitor the health of coastal wetlands/river habitats that filter polluted runoff.
- Collaborate with environmental agencies to establish, identify, and develop corridors and linkages between undeveloped lands and areas.
- Monitor and control invasive species.
- Develop areas for potential conservation easements for protection of vulnerable habitats.

12.6 Impacts Related to Drought/Flooding

South Coast Highway Flooding 2010

Climate change has not only increased drought, but the infrequent rain events the region and the City are experiencing have become more intense. According to current research and studies, the region has not experienced many winter rain events in the recent decades, but the rain events that do occur have become more intense. These intense rain events are leading to more frequent watershed flooding. The City of Oceanside's creeks, lakes, rivers, and other water bodies may overflow outside of their safe boundaries during these heavy rain events, which could impact public and private property. Impacts due to flooding will increase if climate change produces more dramatic storm events over the years, so the City must develop specific adaptation strategies to react to future flood events. The San Luis Rey River is an important visual and recreational amenity, and it is also prone to flooding and wildfire, both of which threaten adjacent development.

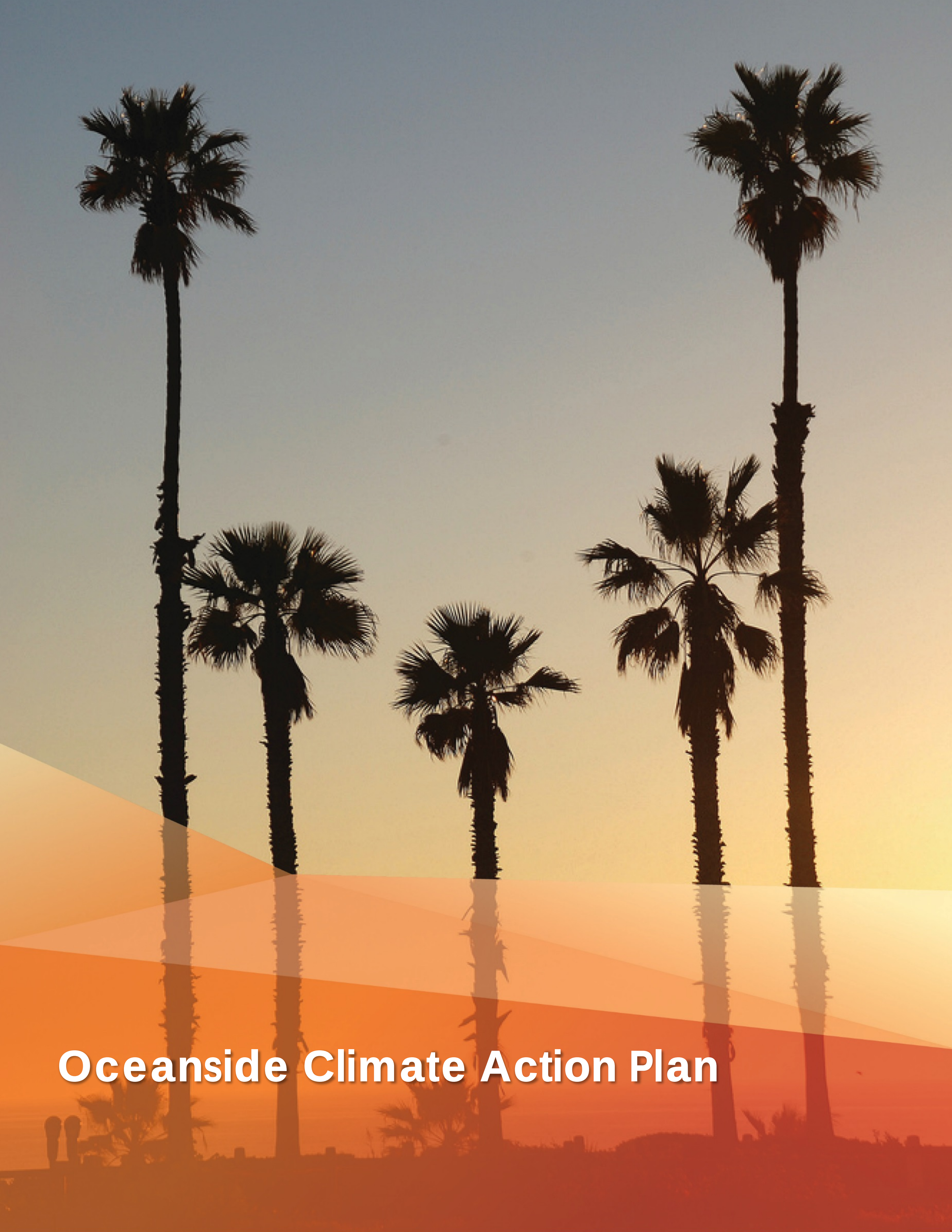
12.6.1 Adaptation Strategies

- Map locations of potential floodplains and flooding related to flooding from storm events.
- Educate the public regarding water conservation.
- Promote conversions of turf grass to drought tolerant landscaping
- Encourage residents to install greywater systems.
- Advocate for alternative water supply techniques, such as ground water and sea water desalination.
- Implement storm water catchment and water reserve systems.
- Encourage the use of native landscaping with deep roots that provide a sponge effect to absorb urban run-off from storm events.

- Replace water dependent landscaping with drought tolerant landscaping to save water and provide a buffer for flood capturing.

APPENDIX A.1

CLIMATE ACTION PLAN



Oceanside Climate Action Plan

~~Public Review Draft~~Final

Oceanside Climate Action Plan

April~~January~~ 2019

Prepared for:

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ARB	Air Resources Board
BAU	Business-As-Usual
CAP	Climate Action Plan
CCE	Community Choice Energy
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFD	Community Facilities District
CH_4	Methane
CIP	Capital Improvements Project
City	City of Oceanside
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSI	California Solar Initiative
EEM	energy efficient mortgages
EIR	environmental impact report
EO	Executive Order
Energy Code	California Energy Code
EPA	Environmental Protection Agency
EV	Electric Vehicle
GHG	greenhouse gas
GWP	global warming potential
HERO	Home Energy Renovation Opportunity
IPCC	Intergovernmental Panel on Climate Change
JPA	Joint Powers Authority
kW	kilowatts
kWh	kilowatt-hours
LIWP	Low-Income Weatherization Program
MPO	metropolitan planning organization
MT	metric tons
N_2O	nitrous oxide
NCTD	North County Transit District
NOAA	National Oceanic & Atmospheric Administration
OTC	Oceanside Transit Center
PACE	Property Assessed Clean Energy
ppm	parts per million
PV	photovoltaic

ReCAP	Regional Climate Action Planning Framework
RPS	Renewable Portfolio Standard
SASH	Single-Family Affordable Solar Housing
SALC	Sustainable Agricultural Lands Conservation
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDG&E	San Diego Gas & Electric
SGOA	Smart Growth Opportunity Areas
TDM	Transportation Demand Management
VMT	vehicle miles traveled
ZEV	Zero Emission Vehicle

Executive Summary

The City of Oceanside's (City) Climate Action Plan (CAP) seeks to align with state efforts to reduce greenhouse gas (GHG) emissions while balancing a variety of community interests: e.g., quality of life, economic development, and social equity. The CAP outlines measures the Oceanside community will take to make progress towards meeting the State of California's 2050 GHG reduction goal.

While federal and state measures are contributing significantly to GHG emissions reduction, climate action at the local level is essential in reducing global emissions to sustainable levels. In California, achieving the State's 2050 GHG reduction target will require local jurisdictions to complement state measures such as low-carbon fuel standards, vehicle fuel-efficiency standards, and the Cap-and-Trade Program.

Reducing the City's carbon footprint requires both local government action as well as a commitment from residents, business owners, and others in the community to reduce their reliance on fossil fuels; pursue clean and renewable energy sources; reduce, reuse, recycle, and compost solid waste; conserve water and carefully manage the City's land resources. Indeed, given that the vast majority of the City's GHG emissions are generated by activities in the private sector, the bulk of the GHG reduction measures outlined in the City's CAP address emissions associated with residential, commercial, industrial, and agricultural uses.

Nevertheless, the City recognizes its role as an exemplar for the Oceanside community and is thus committed to reducing GHG emissions from municipal operations. Led by the Water Utilities and Public Works Departments, the City has already significantly reduced its GHG emissions through a variety of means, including methane (CH_4) cogeneration, streetlight retrofitting, solar photovoltaic installation at numerous municipal facilities, solid waste diversion, energy efficiency retrofitting in municipal buildings, and the Green Oceanside campaign's community education programs. The City will continue to pursue GHG reduction in local government operations while encouraging emissions reduction in the community at-large through a combination of requirements, incentives, and community outreach efforts.

As climate action planning continues to evolve, through advancements in climate science, technology, and public policy, the City's CAP will need to be periodically updated. These updates will be informed by new GHG emissions inventories, which will show how the City's emissions are trending and reveal which emissions reduction measures are most effective. In light of new information, and as new constraints and opportunities arise, the City will adjust its emissions reduction strategy to achieve state-aligned targets.

While the City is on track to meet its state-aligned emissions reduction targets for 2020 and 2030 without additional emissions reduction measures, it is understood that meeting long-term reduction targets requires aggressive action and that taking action now will better position the City to reach long-term reduction targets. Thus, the City intends to begin implementing the CAP measures outlined herein as soon as possible following the CAP's adoption.

Local Context

Oceanside is a 42-square-mile coastal community in northern San Diego County that borders Marine Corps Base Camp Pendleton, the cities of Carlsbad and Vista, and unincorporated areas of San Diego County. The Pacific Ocean serves as the western boundary for the City. The City is situated on the periphery of the San Diego metropolitan area and features a largely suburban land use pattern. However, the City's downtown and coastal areas are becoming increasingly urbanized. As of 2017, Oceanside was home to approximately 175,000 residents, 60,000 households, and 2,900 brick-and-mortar businesses. As these numbers indicate, the City is predominantly residential, with the vast majority of existing housing units constructed between 1970 and 2000.

The City boasts one of the most robust transit hubs in Southern California, the Oceanside Transit Center (OTC). The OTC serves three different passenger rail operations (Amtrak, Metrolink, and the North County Transit District) that provide service to San Diego, Escondido, Orange County, Los Angeles, and other Southern California destinations. The North County Transit District also operates its Breeze bus service from the OTC.

While once heavily dependent on Camp Pendleton, the City's economy has significantly diversified over the past 25 years. Prominent economic sectors present in Oceanside today include health care, sports and active lifestyle product manufacturing, farm-to-table culinary arts, biotechnology, warehousing and distribution, and information/communication technology. Moreover, with a variety of unique coastal amenities, Mission San Luis Rey, Guajome Regional Park, and the SoCal Sports Complex, Oceanside has seen significant growth in its hospitality sector. A number of new lodging uses have been established in recent years, and more hotel development is anticipated in the near future.

Despite recent employment growth, the City's jobs-to-housing ratio remains among the lowest in the San Diego region. Roughly 80 percent of the City's working population commutes to jobs outside of the City, with many of these jobs located on Camp Pendleton, within the Highway 78 corridor, and in the cities of Carlsbad and San Diego (with a strong concentration in the Sorrento Valley area). Many residents also commute to work in Orange County. According to the U.S. Census, the average one-way commute time for Oceanside residents is over 26 minutes, which is similar to the state average. Nearly 80 percent of Oceanside workers drive to work alone.

Oceanside has roughly 3,200 acres of agricultural land in the South Morro Hills Community. With high demand for housing, this area faces intense development pressure. Moreover, the long-term viability of farming is threatened by the cost of water, the cost of labor, and international competition. In an effort to improve the long-term viability of farming in South Morro Hills, the City is exploring ways to facilitate agritourism uses that will provide farmers with additional revenue.

As the City has little remaining vacant land available for new development, it is anticipated that housing and employment growth will occur primarily through infill and redevelopment of already urbanized areas within the City's transit-served commercial corridors, including Coast Highway, Mission Avenue, Oceanside Boulevard, and Vista Way.

Regulatory Background

STATE

In 2005, the State of California adopted legislation that called for the establishment of statewide GHG emissions reduction targets. Since then, California has continued to expand its legislative framework for clarifying and achieving these targets. Executive Order S-3-05 set emissions reduction targets for 2010, 2020, and 2050. These and other interim targets through 2030 were later codified in the Global Warming Solutions Acts of 2006 (Assembly Bill 32) and 2016 (Senate Bill 32). As directed by the legislature, the California Air Resources Board has adopted and periodically revised a State Scoping Plan that outlines the program framework designed to meet the State's GHG emission reduction targets. Concurrently, the California Air Resources Board has developed tools to improve preparedness for climate-related phenomena such as sea-level rise, more frequent and more intense wildfires, and diminished water supply. Since the original Scoping Plan was adopted in 2011, the State has identified local governments as essential partners in meeting the statewide emissions reduction goals. In keeping with this expectation, the California Environmental Quality Act has been revised to require local governments to address the impacts of GHG emissions in both long-range planning and project review.

REGIONAL

The San Diego Association of Governments (SANDAG) is the region's transportation planning agency. In addition to planning and implementing transportation infrastructure and a variety of mobility programs, SANDAG promotes regional GHG emissions reduction through its Sustainable Community Strategy, Electric Vehicle Readiness Plan, and other policies and programs. SANDAG's recently established Climate Framework aids local jurisdictions with CAP preparation and implementation. Oceanside has relied upon the Climate Framework to produce a benefit-cost analysis of the emissions reduction measures outlined in this document. This benefit-cost analysis is attached to the CAP as Appendix D.

SANDAG's regional growth forecasts and recommendations for sustainable transportation options and land use development patterns are expected to play a key role in reducing the City's GHG emissions related to automotive travel.

CITY OF OCEANSIDE

This CAP is being prepared concurrently with the City's focused General Plan Update. The focused General Plan Update will include a new General Plan element, the Energy and Climate Action Element, which will include goals and policies that support the emissions reduction measures.

Plan Purpose

The City of Oceanside CAP demonstrates the City's commitment to developing programs, standards, guidelines, and incentives that support sustainable land use patterns, healthy living, and community character. The CAP integrates the City's past and current GHG reduction efforts with additional measures that seek to balance GHG reduction with other priorities, including quality of life, economic development, and fiscal responsibility. By using energy more efficiently, harnessing renewable energy, reducing, reusing, recycling, and composting waste, conserving water, and enhancing access to sustainable modes of transportation, the City can reduce costs, increase business activity, generate new green jobs, and improve the lives of Oceanside residents in sustainable ways.

To ensure that Oceanside remains on track to achieve the long-term GHG emissions reduction goals of the State, the City will implement reduction measures proactively. Success in implementing these measures will require the City to invest in both capital improvements and human resources to develop sustainable infrastructure, implement new policies and programs, elicit the active participation of the Oceanside community at-large, and monitor progress in reducing the City's carbon footprint.

Inventories

The City, with help from the Energy Policy Initiatives Center of the University of San Diego and the CivicSpark AmeriCorps Program, prepared community and municipal GHG inventories based on emissions in 2013, the earliest year for which the most complete and reliable data was available (see Appendix B). The 2013 "baseline" emissions serve as a starting point against which future inventories may be compared and GHG emissions targets adjusted. The results of the 2013 community inventory are shown in **Figure ES-1**.

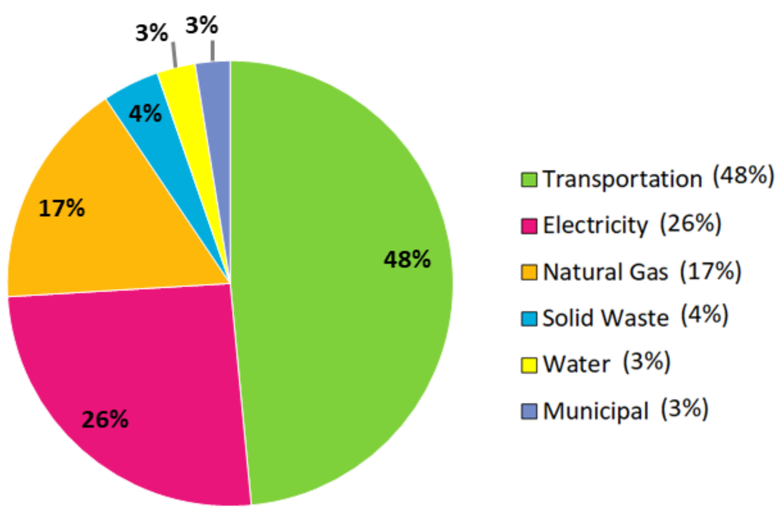


Figure ES-1 Community GHG Emissions by Source for the Baseline Year (2013)

Municipal emissions are a subset of community emissions and account for about 2.5 percent of community emissions. The results of the 2013 municipal inventory are shown in **Figure ES-2**.

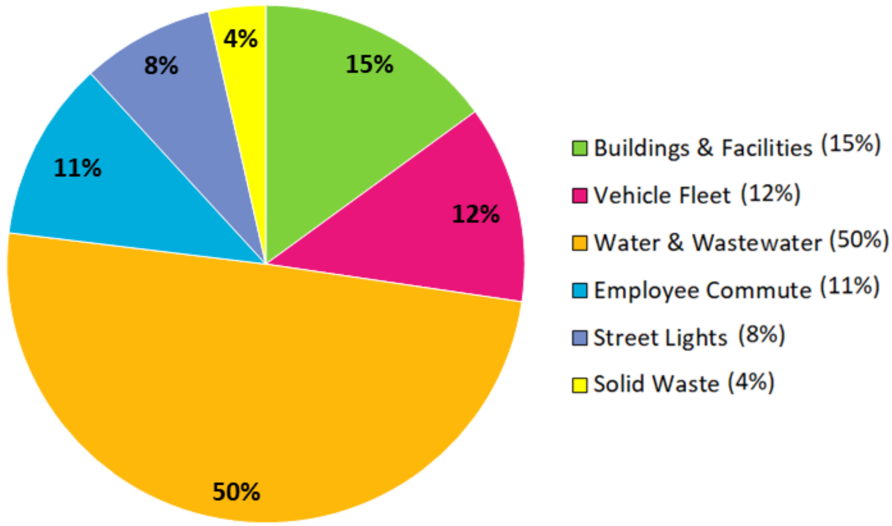


Figure ES-2 Municipal GHG Emissions by Source for the Baseline Year (2013)

Forecasts and Target Setting

Future GHG emissions were initially forecasted under two conditions: "Business-as-Usual" (BAU) and an "Adjusted Business-as-Usual." The BAU condition reflects projected growth in population, employment, and automotive use under existing conditions – i.e., without the benefit of federal, state, or local GHG reduction measures.

Programs and policies implemented at the state and federal levels, including California's Advanced Clean Cars Program and Renewable Portfolio Standards and the federal Corporate Average Fuel Economy standards, will affect local emission levels. Therefore, under the Adjusted BAU scenario, future emissions estimates account for legislation adopted at the state and federal levels. Both the BAU and Adjusted BAU forecasts are shown in **Figure ES-3**.

The City is on track to meet its state-aligned emissions reduction targets for 2020 and 2030 without additional emissions reduction measures. However, it is understood that meeting long-term reduction targets requires aggressive action. The sooner the City takes action, the better positioned it will be to reach long-term reduction targets. Therefore, the City has developed near-term local GHG emissions targets that are more aggressive than State targets and require continuous effort to achieve. Near-term local GHG emissions targets will ensure that local emissions remain on a trajectory that is consistent with the state's 2050 GHG emissions target, which represents the level necessary to help stabilize the climate in the latter half of the 21st century. The City's local GHG emissions targets are expressed in terms of metric tons (MT) of carbon dioxide equivalent (CO_2E) in **Figure ES-3**.

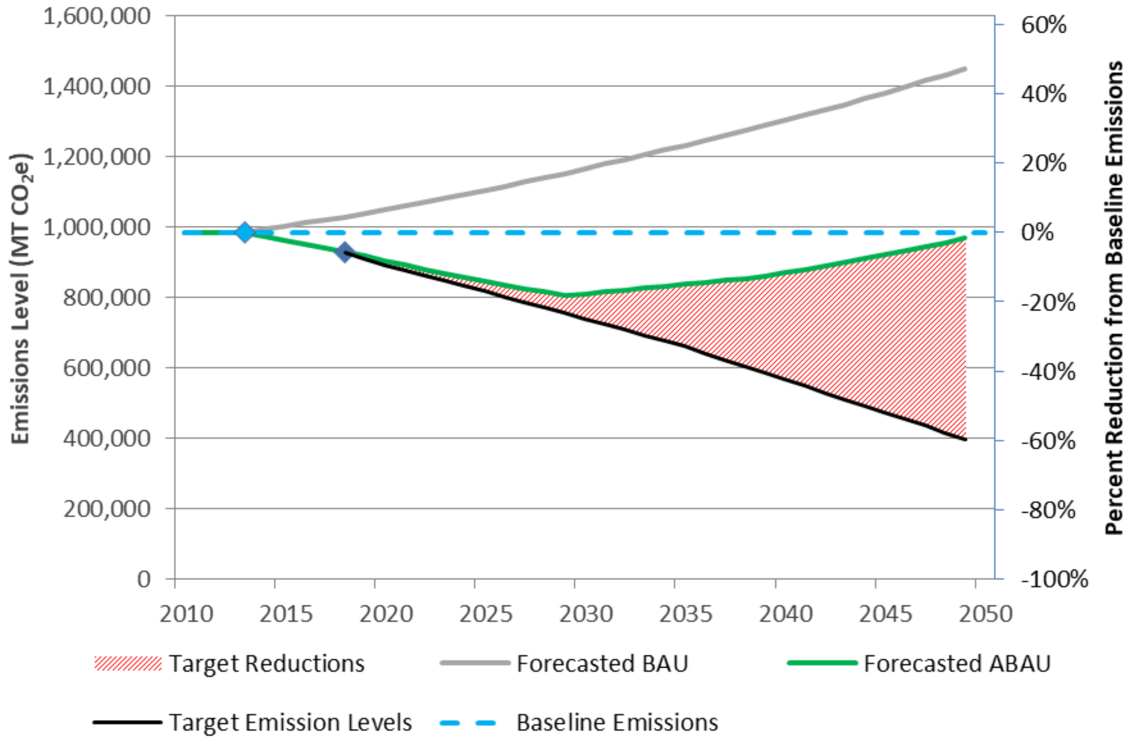


Figure ES-3 Community Emissions Inventory, Forecast, and Targets

Reduction Measures

Due to ongoing efforts by the City, as well as state and federal programs, the City has achieved emission levels of 5.8 MT CO_2e per capita. Continued implementation of existing programs is anticipated to result in emission levels of approximately 4.4 MT CO_2e per capita by 2030. Thus, the City is already well positioned to achieve emission levels consistent with state-aligned targets through 2030. However, growth in population, employment, and vehicle use would result in increased emissions beyond 2030, and without additional reduction measures local emissions would exceed state-aligned targets beyond 2037. **Figure ES-4**, below, illustrates the near-term emission reductions that would be achieved by CAP reduction measures. As **Figure ES-4** shows, without additional reduction measures (i.e., beyond those specified in the CAP), local emissions begin to trend upward around 2030. Meanwhile, state-aligned reduction targets become more aggressive, resulting in a significant gap between these targets and local emission levels. It will thus be necessary for the City to redouble its emission reduction efforts in the years ahead–particularly if future federal and state actions do not produce significant emissions reduction.

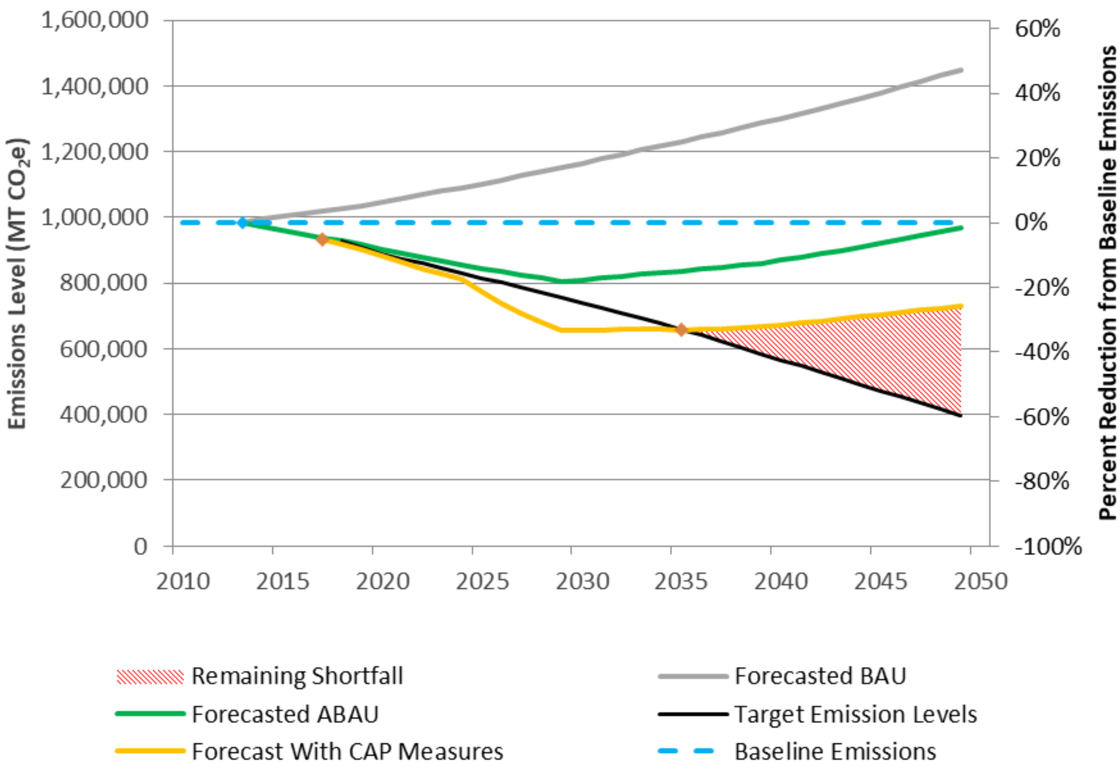


Figure ES-4 Reduced Community Emissions Forecast

Implementation

The Oceanside CAP itself will not achieve the above-noted emission reduction targets. The CAP must be implemented through a variety of concrete actions, and regular monitoring must be performed to ensure policies and programs are functioning as they were intended. The Implementation Chapter of the CAP outlines an implementation timeline, departmental responsibilities, potential funding sources, and monitoring requirements. The six key components of implementation are summarized in **Figure ES-5**, below.

Figure ES-5 Key Components of Implementing the Oceanside Climate Action Plan

01 | Introduction

Chapter 1 **Introduction**

The City of Oceanside (City) is committed to continuing to provide a high quality of living in a way that supports sustainable land use patterns, healthy living, and community character. By using energy more efficiently, harnessing renewable energy to power buildings, reducing, reusing, recycling, and composting waste, conserving water, and enhancing access to sustainable transportation modes, the City can keep dollars in its local economy, create new green jobs, and improve residents' quality of life in sustainable ways. To that end, the City has implemented a number of sustainability and conservation efforts through the Green Oceanside Campaign. The City seeks to continue these efforts in partnership with the local community and regional groups. The Climate Action Plan (CAP) integrates the City's past and current greenhouse gas (GHG) reduction efforts with additional measures that seek to balance GHG reduction with other priorities, including quality of life, economic development, and fiscal responsibility.

PURPOSE

The Oceanside CAP has three primary purposes:

1. Present the City's plan for achieving sustainability by utilizing resources effectively and reducing GHG emissions.
2. Provide a framework for the City to effectively implement this CAP by promoting economic competitiveness, obtaining funding for program implementation, and tracking and monitoring the progress of CAP implementation over time.
3. Streamline environmental review of future development.

Climate Change Science

The term "climate" refers to the meteorological patterns in an area such as average seasonal temperatures, precipitation, and wind patterns. Climate is generally defined as the "average weather" over at least a three-decade period (U.S. Environmental Protection Agency [EPA] 2017). Whereas "weather" refers to changes in temperatures, precipitation, and wind patterns from day to day, climate may remain relatively constant over long-periods, even several millennia.

Global climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind. While the effects of climate change vary regionally, the primary effect of global climate change has been a rise in average global tropospheric temperature of 0.07 degrees Celsius per decade since 1880 and an average rate of 0.17 degrees Celsius per decade since 1970 (National Oceanic & Atmospheric Administration [NOAA] 2017a). Climate change modeling based on year 2000 emissions rates shows that further warming is likely to occur, which would induce further changes in the environment within the current century.

These climate changes are occurring due to the "greenhouse effect," which is an atmospheric process wherein incoming solar energy is trapped in the earth's atmosphere, similar to the glass walls of a greenhouse capture solar energy; gases that contribute to this greenhouse effect are called GHGs. A visual representation of the greenhouse effect is shown in **Figure 1**.

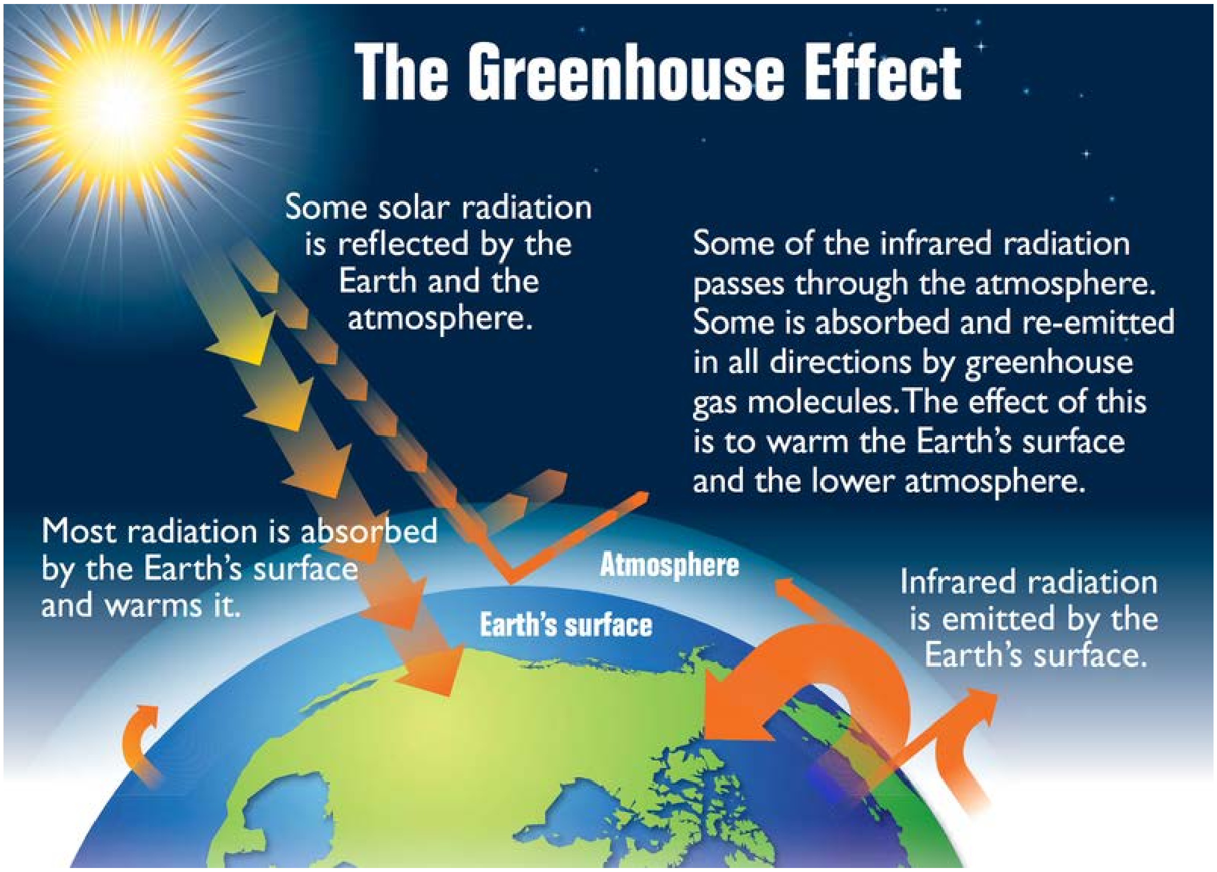


Image Source: Climate Change Indicators in the United States, Second Edition (U.S. EPA 2012).

Figure 1 The Greenhouse Effect

Human-generated GHGs from transportation, energy production, and industry have raised the concentration of carbon dioxide (CO_2) in the atmosphere from an estimated 280 parts per million (ppm) in pre-industrial times, to approximately 350 ppm in 1990, 379 ppm in 2005, and 406 ppm in February 2016 (NOAA 2017b). GHG are generated from both natural processes and human activity. Human-generated GHGs are thought to have significantly contributed to the changes in the global atmospheric concentrations since the beginning of the industrial age. These relatively recent increases in human-generated GHG emissions are largely the result of increasing energy consumption, particularly through the combustion of fossil fuels.

Different GHGs have varying amounts of time that they remain stable in the atmosphere (i.e. atmospheric lifetime) and a varying capacity to trap heat in the atmosphere (i.e. global warming potential [GWP]). Most GHGs have long atmospheric lifetimes, staying in the atmosphere hundreds or thousands of years. GWP is reported as a unitless factor representing the potential for the gas to affect global climate relative to the potential of CO_2 over a period of time. The GWP of a GHG is related to its atmospheric lifetime as well as many other factors such as the chemical reactivity of the GHG. For example, although methane (CH_4) has a shorter atmospheric lifetime than CO_2, it has a 100-year GWP of 28; this means that CH_4 has 28 times more effect on global warming than CO_2 over a 100-year period. Emissions GHGs are generally reported in metric tons (MT) of CO_2 equivalents (CO_2e); where CO_2e is calculated using the mass emissions of an individual GHG multiplied by its GWP. The CO_2e metric provides a consistent methodology for comparing the potential of GHG emissions to contribute to global climate change. It should be noted, the GWP of certain gases have been adjusted over time as greater understanding of the effects on global warming is gained. This CAP reports CO_2e using the 100-year GWP Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, which is consistent with the reporting methodology used by the California Air Resources Board (ARB) in the development of the 2017 Scoping Plan (IPCC 2014, California ARB 2017a).

The three most prevalent GHGs, CO_2, CH_4, and nitrous oxide (N_2O) are emitted by many common activities, such as on-road travel, and consequently represent over 96 percent of the GHG emissions in California (California ARB 2017a). These GHGs are reported in this CAP as further described below.

Carbon Dioxide (CO_2) is the most important anthropogenic GHG and accounts for more than 75 percent of all GHG emissions caused by humans. Because CO_2 is the reference gas for establishing GWP, by definition its GWP is 1. The primary sources of human-generated CO_2 in the atmosphere include the burning of fossil fuels (including motor vehicles), gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon).

Methane (CH_4) is the second most abundant GHG and has a GWP of 28. The atmospheric lifetime of methane is relatively short (12 years). Methane is the main component of natural gas. Sources of human-generated emissions of CH_4 include using natural gas, burning fossil fuels, landfill outgassing, certain agricultural practices, and mining coal.

Nitrous Oxide (N_2O) is a powerful GHG, with an atmospheric lifetime of 121 years and a GWP of 298. Human-generated sources of N_2O include combustion of fossil fuels, agricultural processes (e.g., fertilizer application), and nylon production. In the United States, more than 70 percent of N_2O emissions are related to agricultural soil management practices, particularly fertilizer application.

Other GHGs include numerous perfluorocarbons (PFC), sulfur hexafluoride (SF_6), and hydrofluorocarbons (HFC). These GHGs are emitted in extremely small quantities by certain industrial processes, however may have GWPs in the order of the tens of thousands. These “high-GWP gases” are subject to specific California ARB regulations.

Local Implications of Climate Change

Although climate change is anticipated to affect all areas of the planet, there are numerous implications of direct importance to California. Statewide average temperatures are anticipated to increase by between 4.7 and 10.5 degrees Fahrenheit by 2100 (California Energy Commission [CEC] 2006). Impacts of global warming in California will include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, increased magnitude and frequency of wildfires, and more drought years (California ARB 2017a). Several recent studies have explored the possible negative consequences that climate change, left unchecked, could have in California. The CEC recently developed the Cal-Adapt website that provides a synthesis of existing California climate change scenarios based on input from the state's scientific and research community. Based on generalized projections, climate change impacts in Oceanside will include reduced air quality, diminished water supplies, higher seasonal temperatures (including more extreme heat days), sea level rise, and potential loss of protected species and habitats (California ARB 2017a).

Benefits of the Climate Action Plan

This CAP benefits the City in many direct and indirect ways.

- **Local Control**—This CAP allows the City to identify strategies to reduce resource consumption, costs, and GHG emissions in all economic sectors in a way that maintains local control over the issues and fits the character of the community. It also may position the City for funding to implement programs tied to climate goals.
- **Energy and Resource Efficiency**—This CAP identifies opportunities for the City to increase energy efficiency and lower GHG emissions in a manner that is most feasible in the community. Reducing energy consumption through increasing the efficiency of energy technologies, reducing energy use, and using alternative sustainable sources of energy are effective ways to reduce GHG emissions. Energy efficiency also provides opportunities for cost-savings.
- **Increased Public Health**—Many of the GHG reduction strategies identified in this CAP also have local public health benefits. Benefits include local air quality improvements; creating a more active community through implementing sustainable living practices; and reducing health risks, such as heat stroke, which are elevated by climate change impacts such as increased extreme heat days.
- **Demonstrating Consistency with State GHG Reduction Goals**—A GHG reduction plan may be used to demonstrate that the City is aligned with state goals for reducing GHG emissions to a level considered less than cumulatively considerable.
- **Meet California Environmental Quality Act Requirements**—The California Environmental Quality Act (CEQA) requires impacts from GHG emissions to be reviewed for discretionary projects (such as proposed development projects). This CAP will serve as a Qualified GHG Reduction Strategy consistent with CEQA Guidelines. Environmental review will be simplified; and future development within Oceanside that is consistent with the guidance contained herein would not substantially contribute to global climate change.

Regulatory Setting

In response to rising concern associated with increasing GHG emissions and global climate change impacts, several plans and regulations have been adopted at the international, national, and state levels with the aim of reducing GHG emissions. International, federal, and state actions to stabilize GHG emissions and reduce impacts associated with climate change have been implemented beginning as early as 1988. The government agencies discussed below work jointly, as well as individually, to address GHG emissions through legislation, regulations, planning, policy-making, education, and a variety of programs.

Federal

United States Environmental Protection Agency

The U.S. EPA provides technical expertise and encourages voluntary reductions from the private sector. One of the voluntary programs is the Energy Star program, a joint program of U.S. EPA and the U.S. Department of Energy, which promotes energy-efficient products and practices. Tools and initiatives include the Energy Star Portfolio Manager, which helps track and assess energy and water consumption across an entire portfolio of buildings, and the Energy Star Most Efficient, which provides information on exceptional products that represent the leading edge in energy-efficient products.

Corporate Average Fuel Economy Standards

The federal Corporate Average Fuel Economy standards determine the fuel efficiency of certain vehicle classes in the U.S. Current Corporate Average Fuel Economy standards require vehicle manufacturers of passenger cars and light-duty trucks to achieve an average fuel economy of 35.5 miles per gallon by 2016 (Phase I) and an average fuel economy of 54.5 miles per gallon by 2025 (Phase II). With improved gas mileage, fewer gallons of transportation fuel would be combusted to travel the same distance, thereby reducing nationwide GHG emissions associated with vehicle travel.

On April 13, 2018, the U.S. EPA issued the *Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model year 2022-2025 Light-duty Vehicles* notice. The U.S. EPA notice stated that assumptions of the previous Corporate Average Fuel Economy determination for Phase II standards have significantly changed and that the current standards will remain in effect while the U.S. EPA initiates a rulemaking process to further consider appropriate standards (U.S. EPA 2018). Following a legal challenge by a collation of 16 states, the U.S. Court of Appeals for the Second Circuit issued an April 23, 2018 ruling that overturned the U.S. EPA notice (U.S. Court of Appeals 2018).

State

California Air Resources Board

The California ARB, a part of the California EPA, is responsible for the coordination and administration of both federal and state air pollution control and climate change programs within California. In this capacity, the California ARB conducts research, sets the California Ambient Air Quality Standards, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. The California ARB establishes emissions standards for motor vehicles sold in California, consumer products, and various types of commercial equipment.

State GHG Emission Reduction Targets

EXECUTIVE ORDER S-3-05

On June 1, 2005, California Governor Arnold Schwarzenegger announced through Executive Order (EO) S-3-05, the following GHG emissions targets:

- By 2010, California shall reduce GHG emissions to 2000 levels
- By 2020, California shall reduce GHG emissions to 1990 levels
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels

ASSEMBLY BILL 32—THE CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

Assembly Bill 32 requires the California ARB to reduce statewide GHG emissions to 1990 levels by 2020. As part of this legislation, the California ARB was required to prepare a "Scoping Plan" that demonstrates how the state will achieve this goal. The Scoping Plan was adopted in 2011 and, in it, local governments were described as "essential partners" in meeting the statewide goal, recommending a GHG reduction level 15 percent below 2005 to 2008 levels by 2020.

EXECUTIVE ORDER B-30-15

On April 29, 2015, California Governor Jerry Brown announced through EO B-30-15, the following Interim GHG emissions target:

- By 2030, California shall reduce GHG emissions to 40 percent below 1990 levels

The emission reduction target of 40 percent below 1990 levels by 2030 is an interim-year goal to make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050.

SENATE BILL 32—CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

Approved in September 2016, Senate Bill (SB) 32 updates the California Global Warming Solutions Act of 2006. Under SB 32, the state would reduce its GHG emissions to 40 percent below 1990 levels by 2030. In implementing the 40 percent reduction goal, the California ARB is required to prioritize emissions reductions to consider the social costs of the emissions of GHGs; where "social costs" is defined as "an estimate of the economic damages, including, but not limited to, changes in net agricultural productivity; impacts to public health; climate adaptation impacts, such as property damages from increased flood risk; and changes in energy system costs, per metric ton of [GHG] emission per year."

Climate Change Scoping Plan

As directed by the California Global Warming Solutions Act of 2006, in 2008, the California ARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Original Scoping Plan). The California ARB has periodically revised GHG emissions forecasts and prepared supplemental revisions to the Original Scoping Plan. The Original Scoping Plan identified focus areas comprising major components of the state's economy to evaluate and describe the larger transformative actions that will be needed to meet the state's GHG emission reduction targets. The Original Scoping Plan described local jurisdictions as "essential partners" in achieving the state's emission reduction targets. Guidance in the Initial State Scoping Plan was for local governments to "reduce [GHG] emissions by 15 percent from current levels [2005 to 2008] by 2020. On a per-capita bases that means reducing annual emissions of 14 tons of carbon dioxide equivalent for every man, woman and child in California down to about 10 tons per person by 2020" (California ARB 2008).

In 2014, the California ARB adopted the comprehensive *First Update to the Climate Change Scoping Plan: Building on the Framework* (First Update to the Scoping Plan). The First Update to the Scoping Plan ". . . highlights California's success to date in reducing its GHG emissions and lays the foundation for establishing a broad framework for continued emission reductions beyond 2020" (California ARB 2014).

In November 2017, the California ARB released *The 2017 Climate Change Scoping Plan Update, The Strategy for Achieving California's 2030 Greenhouse Gas Target* (2017 Scoping Plan). Measures under the 2017 Scoping Plan Scenario build-on existing programs such as Low Carbon Fuel Standard, Advanced Clean Cars Program, Renewable Portfolio Standards (RPS), Sustainable Communities Strategy, Short-Lived Climate Pollutant Reduction Strategy, and the Cap-and-Trade Program. Additionally the 2017 Scoping Plan proposes new strategies to reduce GHG emissions from natural and working lands. The 2017 Scoping Plan identifies State strategy for achieving the State's 2030 Interim GHG emission reductions target codified by SB 32. Guidance from the 2017 Scoping Plan calls for local governments to achieve emissions "of no more than six metric tons CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050" (California ARB 2017a).

Assembly Bill 1493, Clean Car Standards

Known as "Pavley I," AB 1493 standards were the nation's first GHG standards for automobiles. AB 1493 requires the California ARB to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible. Additional strengthening of the Pavley standards (referred to previously as "Pavley II," now referred to as the "Advanced Clean Cars Program"), adopted in 2012, is applicable for vehicle model years 2017 to 2025.

Executive Order S-1-07, Low Carbon Fuel Standard

Executive Order S-01-07 mandates: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, and (2) that a Low Carbon Fuel Standard for transportation fuels be established in California.

Senate Bill 375, Sustainable Communities Strategy

SB 375, the 2008 Sustainable Communities and Climate Protection Act, provides for a new planning process that coordinates land use planning, regional transportation plans, and funding priorities to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans developed by metropolitan planning organizations (MPOs) to incorporate a Sustainable Communities Strategy in their plans. The goal of the Sustainable Communities Strategy is to reduce regional vehicle miles traveled (VMT) through land use planning and consequent transportation patterns. SB 375 also includes provisions for streamlined CEQA review for some infill projects, such as transit-oriented development.

Renewable Portfolio Standard

The RPS requires energy providers to derive 33 percent of their electricity from qualified renewable sources by 2020 and 50 percent of their energy from qualified renewable sources by 2030. This is anticipated to lower emission factors (i.e., fewer GHG emissions per kilowatt-hour used) from utilities across the state.

California Code of Regulations Title 24, Parts 6 & 11

California Code of Regulations (CCR), Title 24, Part 6 is the Energy Efficiency Standards or California Energy Code (Energy Code). CCR Title 24, Part 11 is the California Green Building Standard Code or CalGreen. These codes, originally enacted in 1978, establish energy-efficiency and green building standards for residential and non-residential buildings in order to reduce California's energy consumption, water use, and waste generation. New construction and major renovations must demonstrate their compliance with the current Energy Code and CalGreen through submission and approval of a Title 24 Compliance Report to the local building permit review authority and the CEC. By reducing California's energy consumption, water use, and waste generation, statewide GHG emissions may also be reduced. The Energy Code and CalGreen are updated periodically to incorporate and consider new energy-efficiency technologies and methodologies as they become available. The current 2016 Energy Code and 2016 CalGreen, became effective January 1, 2017. The CEC Impact Analysis for the 2016 Energy Code concludes that the 2016 Energy Code results in an 11.7 percent reduction in electricity demand and a 21.1 percent reduction in natural gas use from newly constructed single-family homes (CEC 2015b). Additionally, the 2016 Energy Code results in a 4.6 percent reduction in electricity demand and a 0.5 percent reduction in natural gas use from newly constructed non-residential buildings (CEC 2015b).

The next version of the Energy Code, known as the 2019 Energy Code, was adopted May 9 and will take effect on January 1, 2020. The 2019 Energy Code will include provisions for smart residential photovoltaic (PV) systems, updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements. The new Energy Code aims to reduce energy use in new homes by requiring that all new homes include individual or community solar PV systems or community shared battery storage system that achieves equivalent time-dependent value energy use reduction. Accounting for solar PV requirements, the CEC's preliminary estimates indicate that homes built under the 2019 Energy Code will result in 53 percent less energy use than those built under the 2016 standards.

Senate Bill 1383

In September 2016, Governor Brown signed SB 1383, establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants in various sectors of California's economy. As it pertains to the California Department of Resources Recycling and Recovery (CalRecycle), SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The law grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that not less than 20 percent of currently disposed edible food is recovered for human consumption by 2025. The bill also codifies the California ARB's Short-Lived Climate Pollutant Reduction Strategy, in order to achieve reductions in the statewide emissions of short-lived climate pollutants.

Senate Bill 97

SB 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. The legislation directed the California Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the Resources Agency to certify and adopt the State CEQA Guidelines.

CEQA Guidelines Section 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments that became effective in 2010. CEQA Guidelines Section 15183.5 describes the criteria needed in a GHG reduction plan that would allow for the tiering and streamlining of CEQA analysis for development projects. A plan for the reduction of GHG emissions must contain the following six components to be qualified for tiering CEQA documents:

1. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

2. Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;

3. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;

4. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

5. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and

6. Be adopted in a public process following environmental review.

Regional

San Diego Association of Governments

The San Diego Association of Governments (SANDAG) is the council of governments and transportation planning agency for San Diego County and the 18 cities located within its territory. SANDAG is responsible for cooperative regional planning and furthering an efficient multi-modal transportation system countywide. As the MPO and Regional Transportation Planning Agency, SANDAG supports freeway construction projects, regional and local road improvements, train and bus transportation, railroad crossings, call boxes, ridesharing, congestion management efforts and long-term planning studies.

The California ARB is required to review and update regional SB 375 targets at least every eight years. Following the California ARB Board Hearing on March 22, 2018, the regional GHG emission reduction targets from automobiles and light duty trucks are:

- 15-percent reduction from the 2005 per capita amount by 2020
- 19-percent reduction from the 2005 per capita amount by 2035

To achieve these targets, SANDAG developed and adopted the San Diego Forward. The strategy set forth in San Diego Forward is to "focus housing and job growth in the urbanized areas where there is existing and planned infrastructure, protect sensitive habitat and open space, invest in a network that gives residents and workers transportation options that reduce GHG emissions, promote equity for all, and implement the plan through incentives and collaboration" (SANDAG 2015).

City Setting

The City of Oceanside is a 42-square-mile community of approximately 175,000 residents, 60,000 households, and 2,900 brick-and-mortar businesses. The City of Oceanside is a coastal community in northern San Diego County. Surrounding areas include Camp Pendleton to the north and the cities of Carlsbad to the south and Vista to the east. The median age is approximately 35 years old; 24 percent of the population is younger than 18 years old and approximately 13 percent of the population is at least 65 years old. The median household income in Oceanside is approximately $58,000 per year.

Plan Structure

The remainder of this CAP includes the following chapters:

- **Chapter 2** summarizes the City's historic and future GHG emissions and the reduction targets the City has established.
- **Chapter 3** details the reduction measures that will be implemented to meet the targets identified in Chapter 2.
- **Chapter 4** includes the implementation of the reduction measures, potential funding sources, and how the CAP will be monitored and updated over time.

02 Emissions Inventory, Forecast, and Targets

Chapter 2 Emissions Inventory, Forecast, and Targets

GHG Emissions Inventory

GHG emissions inventories are the foundation of planning for future emissions reductions. Establishing an inventory of emissions helps to identify and categorize the major sources of emissions produced over a single calendar year. The Community Inventory identifies GHG emissions that result from the activities of residents and businesses in the City. The Community Inventory accounts for GHG emissions generated within the City and many indirect GHG emissions that occur outside the City that result from community activities (e.g., electricity generation). Emissions not accounted for in the Community Inventory include upstream emissions inherently associated with production of food and goods, marginal emissions associated with certain agricultural processes, and the community's contribution to regional shipping, airfare, and rail freight. The Municipal Inventory identifies GHG emissions that result from government operations in the City and are a subset of the Community Inventory.

The City prepared Community and Municipal Inventories for the year 2013, which will now serve as the GHG emissions baseline against which future inventories may be compared. Detailed GHG inventory reports prepared by the Energy Policy Initiatives Center of the University of San Diego and the CivicSpark Americorps Program are included as Appendix A and Appendix B. The emission sources evaluated in the inventories are provided in **Table 1**, below.

Table 1 Community and Municipal Sources Evaluated in the Inventories

▪ Electricity	▪ Building and Facilities
▪ Natural Gas	▪ Vehicle Fleet
▪ On-road Transportation	▪ Water and Wastewater
▪ Waste	▪ Employee Commute
▪ Water	▪ Street Lights
▪ Wastewater	▪ Solid Waste

Baseline Year (2013) Community Emissions Summary

The Community Inventory includes the GHG emissions that result from activities within the community, including municipal operations. In the baseline year (2013), the community produced 984,012 MT CO_2e emissions. As shown in **Figure 2** and **Table 2**, below, the on-road transportation sources accounted for the greatest percentage of emissions, contributing 48 percent (477,178 MT CO_2e) of the community's emissions. Electricity use contributed over a quarter (approximately 26 percent) of the community's emissions, producing 256,070 MT CO_2e. Natural gas use contributed approximately 16 percent of the community's emissions, producing 162,447 MT CO_2e. The remaining sources (solid waste, water and wastewater, municipal) accounted for about 9 percent of total emissions.

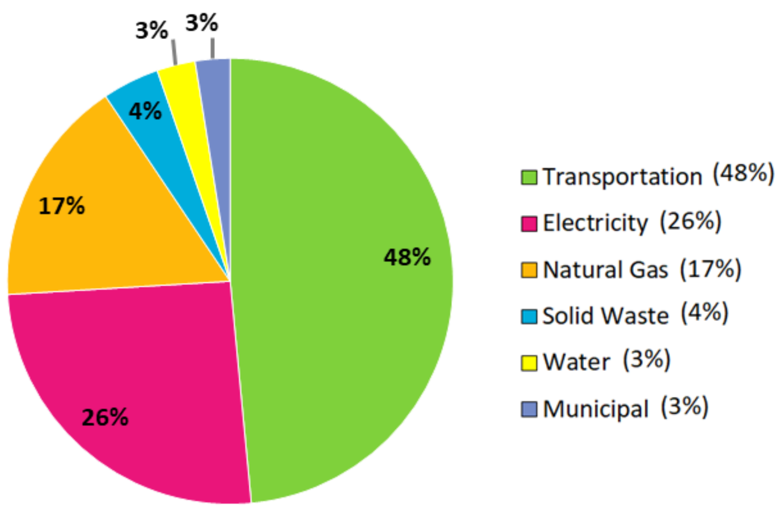


Figure 2 Community GHG Emissions by Source for the Baseline Year (2013)

Table 2 Communitywide GHG Emissions by Source for the Baseline Year (2013)

Source	Activity	Emissions (MT CO_2e)	Percent of Inventory
Transportation	1,014,698,962 VMT	477,178	48.5%
Electricity	675,419,693 kWh	251,524	25.6%
Natural Gas	3,072,959 MMBtu	162,447	16.5%
Solid Waste	120,718 tons	40,615	4.1%
Water*	18,736 Million Gallons	27,420	2.8%
Municipal	Municipal Operations	24,828	2.5%
Municipal Water Facilities	*Community Water Treatment & Distribution*	*7,767*	-
Municipal Wastewater Facilities	*Community Wastewater Treatment*	*3,999*	-
Total	-	984,012	100.0%

*Emissions associated with water and wastewater treatment at City-operated facilities were accounted for as Municipal emissions. Water emissions include upstream emissions from import of water to the City.

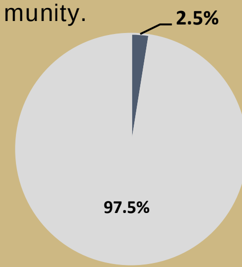
Baseline Year (2013) Municipal Emissions Summary

The Municipal Inventory is a subset of the Community Inventory. The Municipal Inventory includes emissions from activities conducted as part of government operations in the City.

The City's municipal emissions were 24,828 MT CO_2e in 2013, which represents 2.5 percent of the total community emissions. As shown in **Figure 3** and **Table 3** below, the water and wastewater emissions accounted for the greatest percentage of emissions, contributing 50 percent (12,313 MT CO_2e) of the emissions. At 15 percent (3,720 MT CO_2e), building and facilities energy use is the second largest source of emissions in 2013, followed by vehicle fleet at 12 percent (3,066 MT CO_2e), employee commute at 11 percent (2,793 MT CO_2e), street lights at 8 percent (2,054 MT CO_2e), and solid waste at 4 percent (882 MT CO_2e).

Municipal Emissions

Municipal emissions account for 2.5% of total Community emissions. However, municipal emissions are more directly controllable by the City and can be used to showcase sustainability efforts in the Community.



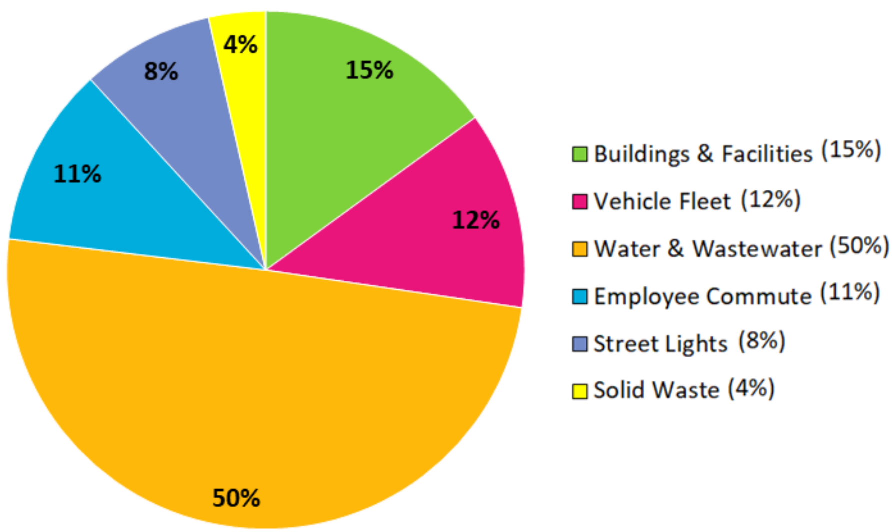


Figure 3 Municipal GHG Emissions by Source for the Baseline Year (2013)

Table 3 Municipal GHG Emissions by Source for the Baseline Year (2013)

Source	Emissions (MT CO_2e)	Percent of Inventory
Water & Wastewater*	12,313	49.6%
Building & Facilities	3,720	15.0%
Vehicle Fleet	3,066	12.3%
Employee Commute	2,793	11.2%
Street Lights	2,054	8.3%
Solid Waste	882	3.6%
Total	24,828	100.0%

* Water and wastewater includes 7,767 MT CO_2E for water treatment, 3,999 MT CO_2E for wastewater treatment, and 547 MT CO_2E of other unspecified Water Utilities Department energy use.

Inventory Forecast

Forecasting future GHG emissions allows the City to understand the variables that will affect emissions in the future. Increases in population, employment, and vehicle miles traveled may affect how to best plan to reduce emissions in the future. GHG emissions are initially forecasted under two conditions: a BAU and an Adjusted BAU, or ABAU, condition. The BAU condition reflects projected growth in population, employment, and automotive use and does not consider policies that will reduce emissions in the future (i.e., the policies and related efficiency levels in place in 2013 are assumed to remain constant through 2050).

The Adjusted BAU condition describes emissions based on projected growth and considers state programs that will achieve GHG reductions in the future. State programs, described in the Regulatory Setting section of Chapter 1, include state-adopted or approved legislation that will affect future emissions such as California's Advanced Clean Cars Program, the California Energy Code, and RPS. By evaluating the two conditions, the City is able to see the effect that existing policies may have on future emissions and thus be better informed about how local actions can provide additional emissions reductions.

Projected growth is estimated using data from regional planning scenarios developed by SANDAG with input from the City. Growth forecasts and associated emissions calculation methods are detailed in the GHG Inventory Report located in Appendix A. The City is expecting growth in population, employment, and vehicle miles traveled during the forecast period. The City also expects growth in its municipal services. **Table 4** below shows the growth projections used to develop the emissions forecasts.

Table 4 Growth Indicators for 2013, 2020, 2030, 2035 and 2050

Community Sector	Growth Indicator	2013	2020	2030	2035	2050
Residential Energy Solid Waste Water & Wastewater	Population	170,361	177,840 (+4%)	184,941 (+9%)	188,597 (+11%)	189,377 (+11%)
Commercial Energy	Commercial Employment	30,030	34,647 (+15%)	45,206 (+51%)	51,637 (+72%)	76,958 (+156%)
Industrial Energy	Industrial Employment	6,002	7,685 (+28%)	10,561 (+76%)	12,380 (+106%)	19,945 (+232%)
Transportation	Vehicle Miles Traveled	1,014,698,962	1,058,495,996 (+4%)	1,118,974,444 (+10%)	1,150,497,401 (+13%)	1,250,495,302 (+23%)
Municipal Source	**Growth Indicator**	**2013**	**2020**	**2030**	**2035**	**2050**
Buildings & Facilities Employee Commute Vehicle Fleet Solid Waste Facilities	Municipal Employment	840	940 (+12%)	1,147 (+37%)	1,266 (+51%)	1,704 (+103%)
Water & Wastewater Street Lights	Population	170,361	177,840 (+4%)	184,941 (+9%)	188,597 (+11%)	189,377 (+11%)

Forecasts are made for several milestone years: 2020, 2030, 2035, and 2050. The 2020 forecast year parallels the goals identified in AB 32, which identifies a statewide GHG reduction target by 2020. The 2030 forecast year parallels the goals identified in SB 32, which establishes a statewide GHG reduction target by 2030. The 2035 forecast year corresponds to the horizon year of the City's General Plan. The 2050 forecast year parallels the goals identified in Executive Order S-03-05, which establishes a statewide GHG reduction target by 2050.

Community Forecasts

Community BAU Forecast

Under the BAU condition, projected emissions scale with the community's projected growth in population, employment, and vehicle miles traveled. The community's BAU emissions in 2020 are estimated to be 1,047,245 MT CO_2e (5.9 MT CO_2e per capita), or 6.4 percent above the baseline level. By 2030, emissions are estimated to increase to 18.3 percent above the baseline level to 1,164,466 MT CO_2e (6.3 MT CO_2e per capita). By 2035, emissions are estimated to increase to 25.2 percent above the baseline level to 1,231,500 MT CO_2e (6.5 MT CO_2e per capita). By 2050, emissions are estimated to increase to 47.3 percent above the baseline level to 1,449,240 MT CO_2e (7.7 MT CO_2e per capita) (**Figure 4** and **Table 5**, below).

Community Adjusted BAU Forecast

Under the Adjusted BAU condition, projected emissions also scale with the community's projected growth in population, employment, and vehicle miles traveled. However, the Adjusted BAU condition also accounts for state and federal regulations, notably vehicle emission regulations that increase fuel efficiency and thereby reduce emissions. The community's Adjusted BAU emissions are anticipated to decrease through 2030, at which point they are estimated to be 810,293 MT CO_2e (4.4 MT CO_2e per capita), or 17.7 percent below the baseline level. Existing California Renewable Portfolio Standard mandates do not extend beyond 2030. Subsequent to 2030, the City's Adjusted BAU emissions show an increasing emissions trend as growth in the residential, commercial, and industrial energy sectors emissions outpace transportation reductions achieved by Clean Cars Programs.

By 2050, emissions are estimated to increase to 1.7 percent below the baseline level to 967,458 MT CO_2e (5.1 MT CO_2e per capita) (**Figure 4** and **Table 6**, below).

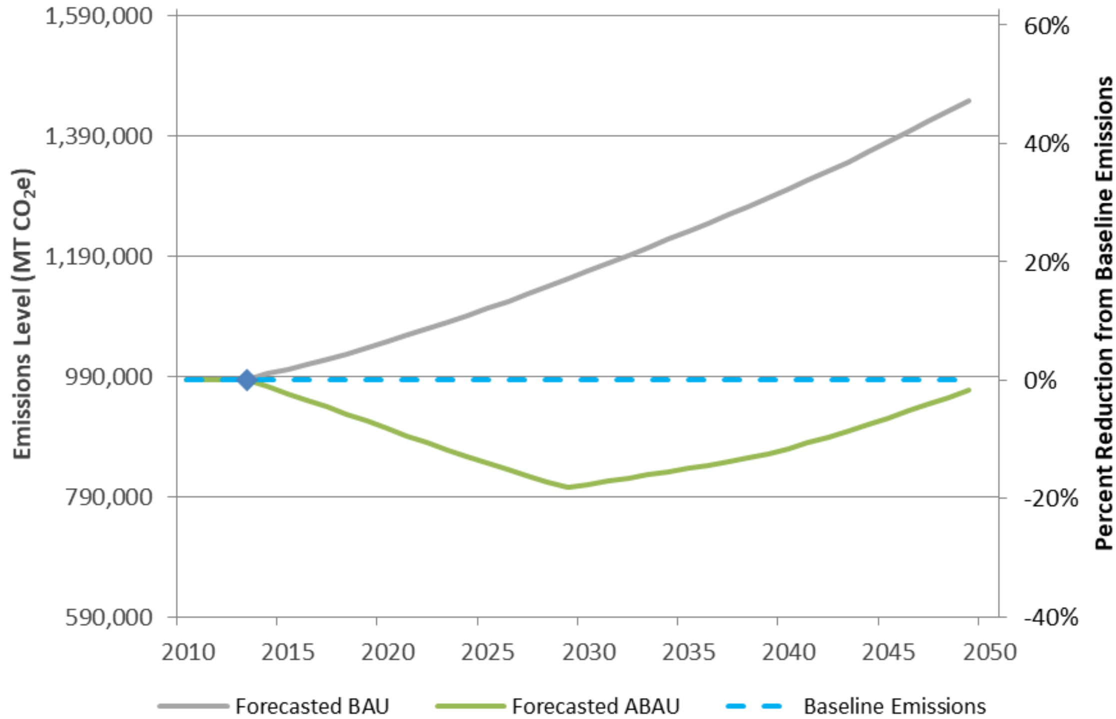


Figure 4 Community BAU and Adjusted BAU Emissions

Table 5 Community BAU

Sector	BAU MT CO_2e					
	2013	2020	2030	2035	2040	2050
Residential Energy	222,963	229,668	238,839	242,675	243,009	243,611
Commercial Energy	159,370	185,470	241,992	276,417	315,739	401,146
Industrial Energy	41,957	53,453	73,459	86,116	100,953	134,395
Transportation	483,037	499,795	528,352	543,237	558,541	587,184
Solid Waste	41,498	42,614	44,131	44,757	44,348	44,458
Water & Wastewater	35,187	36,245	37,693	38,298	38,351	38,446
Total	984,012	1,047,245	1,164,466	1,231,500	1,300,941	1,449,240

Table 6 Community Adjusted BAU

Sector	Adjusted BAU MT CO_2e					
	2013	2020	2030	2035	2040	2050
Residential Energy	222,963	207,587	187,422	188,533	188,624	188,789
Commercial Energy	159,370	162,721	179,404	204,180	232,209	293,089
Industrial Energy	41,957	45,345	49,922	58,193	67,743	89,268
Transportation	483,037	415,229	323,975	315,553	310,627	325,907
Solid Waste	41,498	42,614	44,131	44,757	44,348	44,458
Water & Wastewater	35,187	30,592	25,439	25,848	25,883	25,947
Total	984,012	904,088	810,293	837,064	869,434	967,458

As reflected in the difference between Table 5 and 6, California Renewable Portfolio Standard mandates and Energy Code requirements result in an approximate 25 percent reduction in the Adjusted BAU emissions from the residential, commercial, industrial energy sectors by 2030. California Renewable Portfolio Standards also result in a 33 percent reduction to the water and wastewater sector by 2030 as it reduces emissions associated with energy used to treat and distribute water. Vehicle efficiency regulations such as the Clean Cars Program result in an approximate 44 percent reduction in Adjusted BAU transportation emissions by 2050.

Municipal Forecasts

Municipal BAU Forecast

The City's municipal BAU emissions in 2020 are estimated to be 26,638 MT CO_2e, or a 7.3 percent increase from baseline emissions. By 2030, emissions are estimated to increase to 20.7 percent above the baseline level to 29,964 MT CO_2e. By 2035, emissions are estimated to increase to 28.1 percent above the baseline level to 31,808 MT CO_2e. By 2050, emissions are estimated to increase to 50.4 percent above the baseline level to 37,329 MT CO_2e (**Figure 5** and **Table 7**, below).

Municipal Adjusted BAU Forecast

The municipal Adjusted BAU emissions are anticipated to decrease through 2030, at which point they are estimated to be 21,979 MT CO_2e, or an 11.5 percent from the baseline level. Existing state Renewable Portfolio Standard mandates do not extend beyond 2030. Subsequent to 2030, the City's Adjusted BAU emissions show an increasing emissions trend as growth in the buildings and facilities energy use, water and wastewater, and street light emissions outpace vehicle fleet and employee commute reductions achieved by Clean Cars Programs. By 2050, emissions are estimated to increase to 6.7 percent above the baseline level, 26,500 MT CO_2e (**Figure 5** and **Table 8**, below).

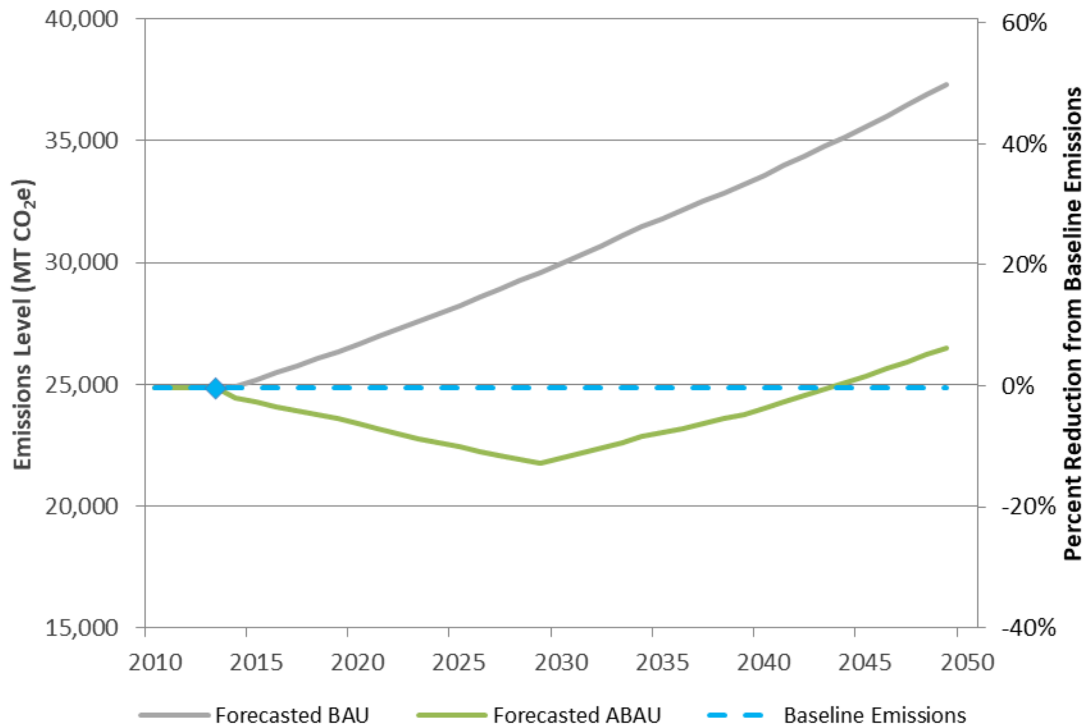


Figure 5 Municipal BAU and Adjusted BAU Emissions

Table 7 Municipal BAU

Source	BAU MT CO_2e					
	2013	2020	2030	2035	2040	2050
Building & Facilities	3,720	4,210	5,182	5,750	6,380	7,692
Vehicle Fleet	3,066	3,470	4,272	4,739	5,258	6,340
Water & Wastewater	12,313	12,683	13,190	13,401	13,420	13,453
Employee Commute	2,793	3,161	3,891	4,318	4,790	5,776
Street Lights	2,054	2,116	2,200	2,236	2,239	2,244
Solid Waste	882	998	1,229	1,364	1,513	1,824
Total	24,828	26,638	29,964	31,808	33,600	37,329

Table 8 Municipal Adjusted BAU

Source	Adjusted BAU MT CO_2e					
	2013	2020	2030	2035	2040	2050
Building & Facilities	3,720	3,657	3,764	4,177	4,634	5,587
Vehicle Fleet	3,066	2,957	2,829	3,005	3,220	3,877
Water & Wastewater	12,313	11,386	10,378	10,545	10,559	10,585
Employee Commute	2,793	2,626	2,386	2,508	2,664	3,206
Street Lights	2,054	1,744	1,393	1,416	1,418	1,421
Solid Waste	882	998	1,229	1,364	1,513	1,824
Total	24,828	23,368	21,979	23,015	24,008	26,500

As reflected in the difference between Table 7 and 8, California Renewable Portfolio Standard mandates result in an approximate 21 to 37 percent reduction in the BAU emissions from the streetlights, building and facility energy use, and water and wastewater treatment and distribution between 2013 and 2030. Vehicle efficiency regulations such as the Clean Cars Program result in approximate 40 and 44 percent reductions in BAU emissions from the municipal vehicle fleet and employee commute between 2013 and 2050.

GHG Emissions Targets

As discussed in Chapter 1, state GHG reduction efforts were initiated by EO S-3-05 in 2005. The EO established a 2050 GHG emissions target that "represents the level of greenhouse gas emissions that advanced economies must reach if the climate is to be stabilized in the latter half of the 21st century" (California ARB 2008). The EO also established a 2020 GHG emissions target goal "to be an aggressive, but achievable, mid-term target" (California ARB 2008). The 2020 target was codified by the State Legislature as AB 32.

A decade later, EO B-30-15 established an additional interim 2030 GHG emissions target "in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050." The 2030 target was codified by the State Legislature as SB 32.

These GHG emissions targets include:

- by 2020, reduce GHG emissions to 1990 levels (431 million MT CO_2e);
- by 2030, reduce GHG emissions to 40 percent below 1990 levels (260 million MT CO_2e); and
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

On a per-capita basis the 2020 GHG emissions target requires that emissions be reduced to "about 10 tons per person by 2020" (California ARB 2008) and the subsequent targets require that emissions be reduced to "no more than six metric tons CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050" (California ARB 2017).

<u>This document establishes GHG reduction targets for 2030 that are more rigorous than the State's six MT CO_2e per capita goal. The City's goal is to achieve GHG emission levels of four MT CO_2e per capita. A 2050 target of 2.0 MT CO_2e per capita is established for the City consistent with recommendations of the 2017 Scoping Plan and international agreements, such as the "Under 2 MOU," which requires that all "signatories agree to reduce their GHG emissions to two metric tons CO2E per capita by 2050." This is the most commonly agreed upon 2050 target and directly relates to the long term target of EO-S-05.</u>

Community Targets

State-aligned Per Capita Targets

The state also has provided guidance to local jurisdictions as essential partners in achieving the state's goals. Guidance in the Original State Scoping Plan was for local jurisdictions to "reduce [GHG] emissions by 15 percent from current levels [2005-2008] by 2020". Newer guidance from the 2017 Scoping Plan recommends that local jurisdictions adopt plan-level GHG reduction goals "that align with the statewide per capita targets" (California ARB 2017). Thus, local jurisdictions must establish GHG emissions targets "of no more than six metric tons CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050" (California ARB 2017).

Reduction targets consistent with current regulations and in line with state goals are shown below ("State-aligned Emissions Targets"; **Figure 6**). As shown, the City has already achieved emission levels consistent with state-aligned per capita targets for 2030. Due to ongoing efforts by the City, as well as state and federal programs, the City is forecasted to achieve emission levels consistent with state-aligned per capita targets through 2037. However, without further local action, the City would not achieve per capita emission levels consistent with the state's 2050 GHG emissions target.

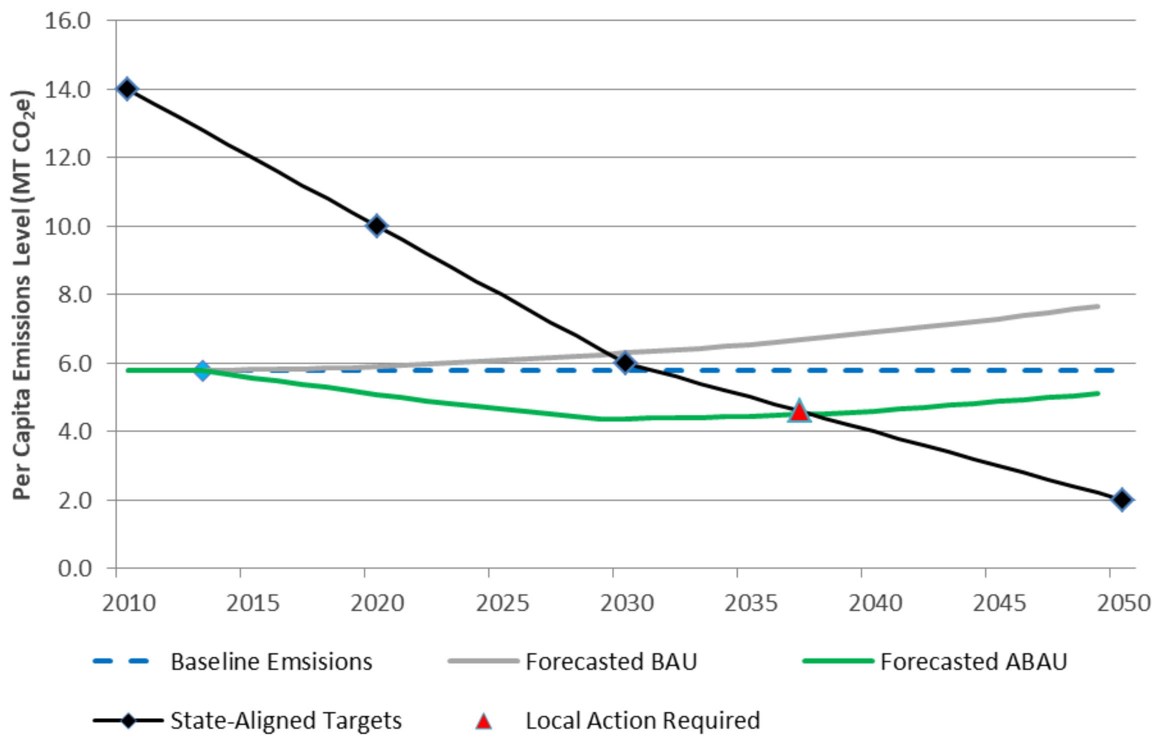


Figure 6 Community Emissions Inventory, Forecast, and Targets

Accelerated Local Per Capita Targets

While the City is on track to meet its state-aligned emissions reduction targets for 2020 and 2030 without additional emissions reduction measures, meeting long-term reduction targets requires aggressive action and actions taken now will better position the City to reach these long-term reduction targets.

The City has developed local GHG emissions targets that follow a linear path from baseline emission levels to the long-term per capita target of 2 MT CO_2e per capita by 2050. These local GHG emissions targets include:

- by 2020, reduce GHG emissions levels to 5 MT CO_2e per capita;
- by 2030, reduce GHG emissions levels to 4 MT CO_2e per capita;
- by 2040, reduce GHG emissions levels to 3 MT CO_2e per capita; and
- by 2050, reduce GHG emissions levels to 2 MT CO_2e per capita.

In the near-term, local GHG emissions targets ("Oceanside Emissions Goals"; **Table 9** and **Figures 7 and 8**) are substantially more aggressive than state-aligned per capita targets; achieving these targets requires immediate action. Over the long-term, local GHG emissions targets gradually approach state-aligned per capita targets; continuous effort to achieve these targets will ensure that local emissions remain on a trajectory that is consistent with the state's 2050 GHG emissions target.

Table 9 Local GHG Emissions Targets

Metric	Emissions (MT CO_2e)							
	2013	2020	2025	2030	2035	2040	2045	2050
City Population Forecast	170,361	177,840	181,356	184,941	188,597	188,857	189,117	189,377
City Employment Forecast	37,721	44,068	50,466	57,793	66,184	75,793	86,797	99,399
Total Service Population	208,083	221,908	231,822	242,734	254,781	264,650	275,914	288,776
Per Capita Adjusted BAU Emissions	5.8	5.1	4.7	4.4	4.4	4.6	4.9	5.1
Per Service Population Adjusted BAU Emissions	4.7	4.1	3.6	3.3	3.3	3.3	3.3	3.4
Adjusted BAU Emissions	984,012	904,088	845,114	810,293	837,064	869,434	921,234	967,458
Oceanside Per Capita Emissions Goals	-	5.0	4.5	4.0	3.5	3.0	2.5	2.0
Oceanside Per Service Population Emissions Goals	-	4.0	3.5	3.0	2.6	2.1	1.7	1.3
Oceanside Emissions Goals	-	889,200	816,101	739,764	660,090	566,570	472,792	378,754
Oceanside Target Reductions From Baseline†		94,812 (10%)	167,911 (17%)	244,248 (25%)	323,922 (33%)	417,442 (42%)	511,220 (52%)	605,258 (62%)
Oceanside Target Reductions From Adjusted BAU†	-	14,888 (2%)	29,013 (3%)	70,529 (9%)	176,974 (21%)	302,864 (35%)	448,442 (49%)	588,704 (61%)

† Oceanside Target Reductions are defined as the difference between the baseline (2013) emissions or the Adjusted BAU emissions and the Oceanside Reduction Goals.

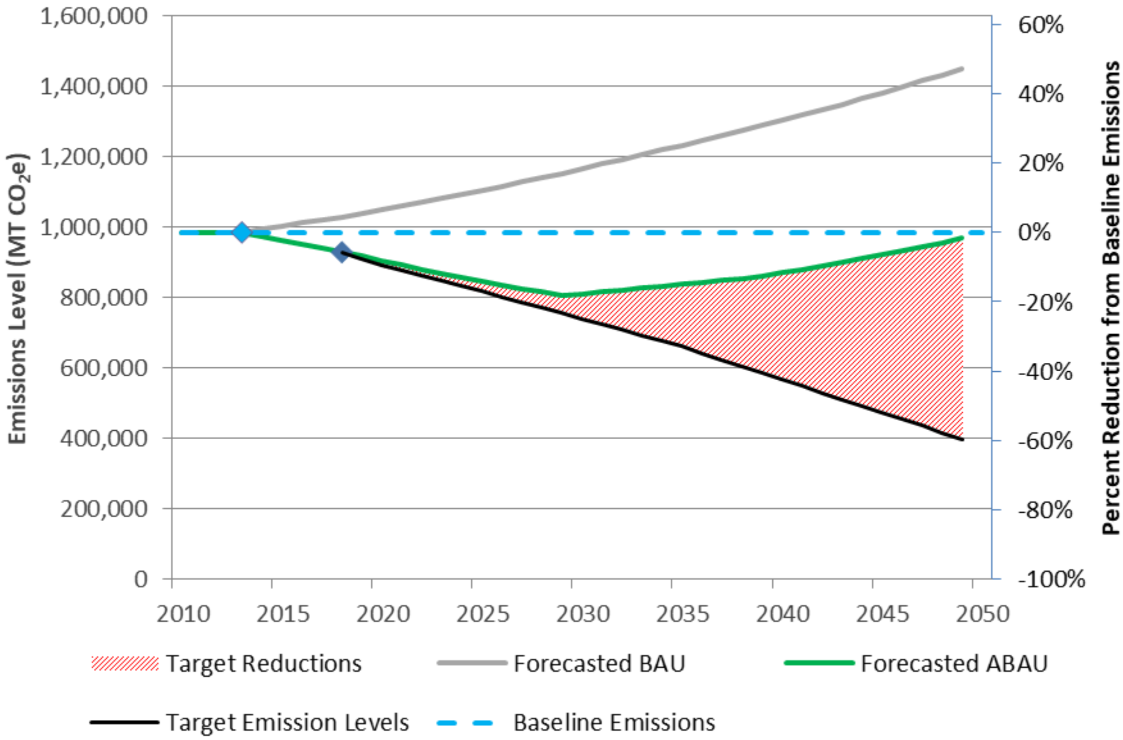


Figure 7 Community Emissions Inventory, Forecast, and Targets

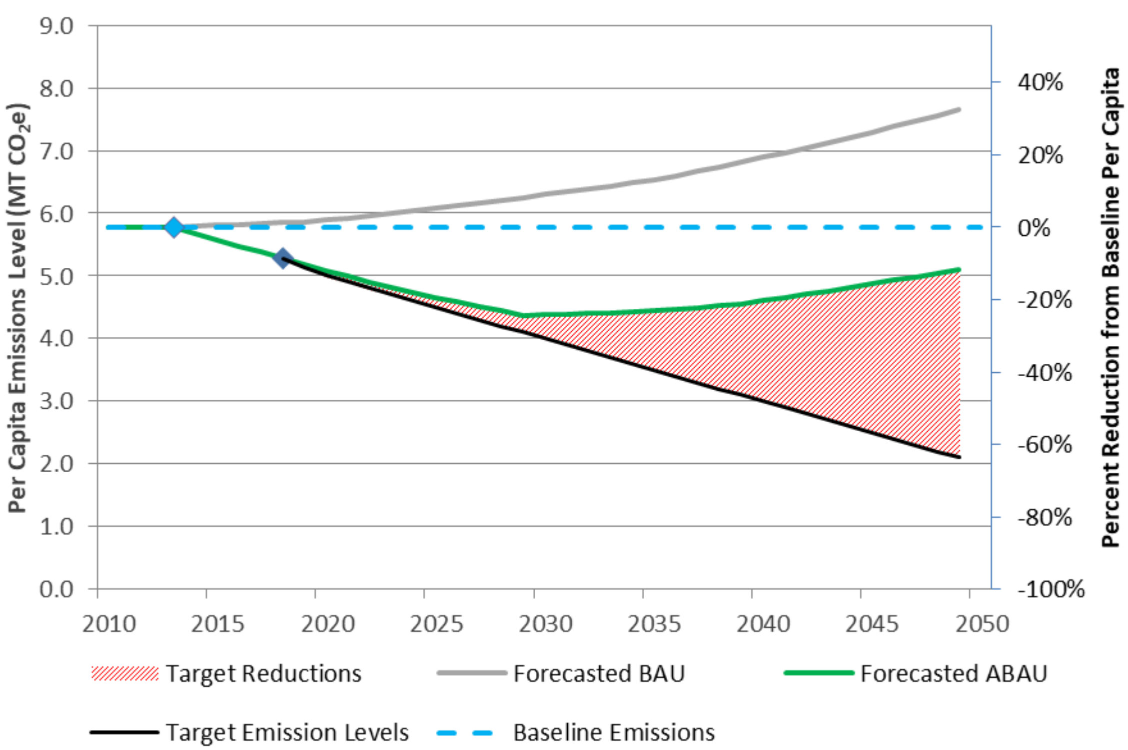


Figure 8 Per Capita Community Emissions Inventory, Forecast, and Targets

03 Reduction Measures

Chapter 3 **Reduction Measures**

To ensure the City remains on track to achieve the long-term emission reduction goals of the State, the City has chosen to implement GHG emission reduction measures proactively. This chapter details how the City will reduce its near-term GHG emissions and establish infrastructure to support continued reductions beyond 2030. As the City is already projected to meet state-aligned per capita near-term emissions targets (2020 and 2030), reduction measures were primarily selected based on their ability to achieve substantial, long-term GHG emission reductions in a cost-effective manner.

Each measure describes the overarching goal, such as increasing energy efficiency in residential building units or offsetting energy consumption. Reduction measures are further divided into one or more discrete strategies that the City may implement. Strategies are designed to include the steps needed to implement the GHG reduction measure and are considered essential to guiding staff in implementation. Strategies may be added or removed over time, depending on their relevancy, funding availability, and whether reduction measures are effective as they are monitored over time. In addition, co-benefits for each reduction measure are indicated by the following icons:

Local Co-Benefits

Air Quality Improvement	Energy Demand Reduction	Sustainability/ Climate Action Education
Infrastructure and Service Efficiency Improvement	Land Use/ Community Design Enhancement	Local Energy Generation
Non-motorized Transportation Increases	Public Health Improvement	Increased Resiliency
Resource Conservation	Zero Waste	Water Conservation

Energy and Buildings

Electricity consumption and natural gas use account for about 26 and 16 percent of Oceanside's community GHG emissions, respectively. As such, many of the reduction measures target residential and non-residential (commercial, industrial, municipal) electricity and natural gas use.

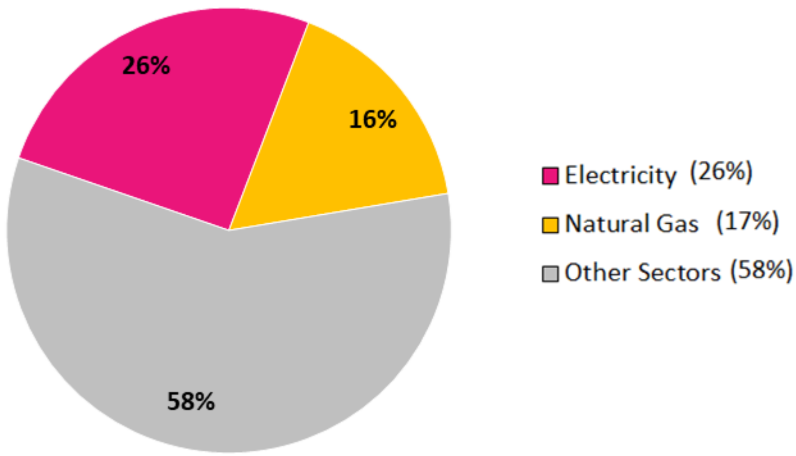


Figure 9 Energy Use Sector Emissions Relative to Total Community Emissions

Measures

- E1—Renewable Energy Procurement
- E2—Solar Photovoltaic Promotion Program
- E3—Residential Energy Conservation and Disclosure
- E4—Promotion of Low-Income Financing Programs
- E5—Non-Residential Building Energy Benchmarking and Disclosure

Measure E1: Renewable Energy Procurement

Different modes of electricity generation have different GHG emission intensities. While the amount of renewable energy generation has risen dramatically in recent years, the majority of electricity, both nationwide and in California, is still generated using non-renewable resources such as natural gas, coal, and other fossil fuels. Renewable energy sources such as wind, solar, biomass, and geothermal generate electricity without releasing GHG emissions, thus, transitioning from fossil fuels to renewable energy source has potential to drastically reduce community GHG emissions from the energy sector.

As discussed previously, California RPS requires that electricity supply companies (i.e., investor-owned utilities, electric service providers, and community choice aggregators) source a share of electricity from renewable sources – 33 percent of electricity must be procured from renewable energy sources by 2020 and 50 percent of electricity must be procured from renewable energy sources by 2030. The local utility, San Diego Gas & Electric (SDG&E), has already achieved renewable energy procurement that exceeds the 2020 mandate (43 percent).

The City can indirectly influence energy procurement through collaboration with SDG&E or can directly manage energy procurement through a Community Choice Energy (CCE) Program. If the City creates a CCE Program, it would assume responsibility for negotiating power purchase agreements with generation facilities on behalf of its residents and businesses, while SDG&E would continue to maintain transmission and distribution infrastructure. The goal of this measure is procure 75 percent of local energy from renewable sources by 2030 and thereby exceed California RPS mandates.

Strategies

- Adopt a Renewable Energy Procurement Policy that mandates that the City will procure 75 percent of local energy from renewable sources. Mechanisms for achieving Renewable Energy Procurement goals could include partnership with SDG&E, Community Choice Aggregation, or similar program.
- Collaborate with SDG&E to explore potential mechanisms to achieve Renewable Energy Procurement goals through partnership with SDG&E such as encouraging homeowners or businesses to participate in SDG&E’s EcoChoice or EcoShare Programs.
- Collaborate with SDG&E to reassess community energy procurement annually based on CPUC RPS Program Compliance Reports and participation in SDG&E EcoChoice or EcoShare Programs annually and make results available to the public.
- Conduct a CCE Program Feasibility Study and collaborate with neighboring jurisdictions to explore opportunities to establish a regional Joint Powers Authority CCE Program.

E1: Renewable Energy Procurement

GHG Reductions Achievable by Measure

2030:
73,685 MT CO_2e

Co-Benefits:

Measure E2: Solar Photovoltaic Promotion Program

Solar photovoltaic (PV) panels generate electricity without releasing emissions and thereby reduce electricity demand and emissions from non-renewable energy generation. Additionally, solar generation is well suited for on-site renewable energy generation, which can both improve accountability.

As of late 2016, Oceanside currently has approximately 10.2 megawatts (MW) of grid interconnected solar panels[2]. This is approximately 16 percent higher than it was at the end of the 2013 baseline year (8.8 MW)[2]. Oceanside's grid-interconnected solar panels are 73 percent commercial (7.5 MW), 21 percent residential (2.2 MW), 4 percent governmental (0.5 MW) and 1 percent non-profit (0.1 MW).[1] Additionally the City operates 1 MW of solar panels at the San Luis Rey Wastewater Treatment Plant as well as solar arrays at various other municipal buildings. For reference, a typical residential solar panel system is approximately 5 kilowatts (kW).

Strategies

- Adopt an ordinance that requires all new development projects that include 50 or more off-street parking spaces to offset at least 50 percent of forecasted energy demand through on-site renewable energy sources[2].
- Continue to promote financing options and rebates available through SDG&E, the California Solar Initiative, and Property Assessed Clean Energy (PACE) Programs such as the Home Energy Renovation Opportunity (HERO), California First, Ygrene, Figtree, and California Statewide Communities Development Authority Programs.
- Maintain the Expedited Permitting for Residential Solar PV Systems and, on a continuing basis, ensure that regulatory provisions such as compliance with zoning regulations, structure height limitations, permits submittal, review process, etc. do not hinder solar PV installation.
- Collaborate with local solar PV system vendors to establish an Aggregated Demand Solar PV Program. To implement the program, the City will advertise to the community on behalf of local vendors in exchange for negotiated for discounted "bulk pricing."

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1 Data from the California Solar Initiative. Includes CEC-rating for all installations through 1/20/2017 (California Solar Initiative 2017a).

2 The Energy Code will require that new residential projects incorporate renewable energy beginning January 1, 2020. The residential-component of the Ordinance will achieve GHG emission reductions by enforcing renewable energy requirements beginning at an earlier date. Emissions reductions estimates conservatively exclude this effect and only account for reductions from the commercial- and industrial-components of this measure.

E2: Solar (PV) Promotion Program

GHG Reductions Achievable by Measure

2020:	2030:
5,089 MT CO_2e	19,448 MT CO_2e

Co-Benefits:

Measure E3: Residential Energy Conservation and Disclosure

California's first energy efficiency standards, known as Title 24 Standards, were adopted in 1977 and became effective in 1978. Title 24 standards have been updated every 2 to 5 years, creating increasingly stringent energy efficiency requirements for new construction. As a result of these aggressive energy efficiency standards, per capita electricity use in California is one of the lowest in the nation.[3] Approximately 25 percent of the City's housing stock was constructed prior to 1980 and thus were not subject to any energy efficiency standards (City of Oceanside 2013). Households constructed under previous, less stringent versions of Title 24 also may not include energy efficiency upgrades. Promoting residential energy conservation and time-of-sale disclosure can increase the efficiency of the City's housing stock by encouraging energy efficiency upgrades to existing homes

Strategies

- Promote disclosure of historic building energy use, energy use benchmark scores, and energy audits at the time-of-sale of residential real estate.
- Promote financing options and rebates for residential energy efficiency upgrades available through SDG&E, the California Solar Initiative, and PACE Programs.

E3: Residential Energy Conservation and Disclosure

GHG Reduction – Not Quantified
Disclosure remains voluntary.

Co-Benefits:

3 As of 2015, California is ranked 49th (of 51) for per capita electricity use. Note that per capita electricity use does not correct for factors such as average household size or climate zone. The State's with the lowest average household electricity use were New York and Rhode Island (U.S. Energy Information Administration 2017).

Measure E4: Promotion of Low-Income Financing Programs

Solar PV and energy efficiency upgrades can often provide long-term financial relief to families struggling with high and unpredictable energy costs. Unfortunately, the capital investment remains a significant barrier for the families who most need relief from rising bills. Recently, the typical cost of solar panels has dropped substantially, from approximately $11 per watt in 2007 to $3 to $5 per watt in 2016 (California Solar Initiative 2017b). However, as of 2016 a typical kW solar electric system will still cost homeowners from $15,000 to $25,000 including materials, installation, and labor. This may be a daunting amount to many homeowners, as the median yearly household income in Oceanside is approximately $58,000 (U.S. Census 2017). The State offers alternative financing to households with incomes below 80 percent of the area median income as part of the Single-Family Affordable Solar Housing (SASH) Program and offers alternative financing for other energy efficiency upgrades as part of the Low-Income Weatherization Program (LIWP).

Strategies

- Promote financing options available through the SASH Program and offer alternative financing for other energy efficiency upgrades as part of the LIWP.

E4: Promotion of Low-Income Financing Programs

GHG Reduction – Not Quantified
Number of homes that would qualify for SASH and LIWP Programs has not been identified.

Co-Benefits:

Measure E5: Non-Residential Building Energy Benchmarking and Disclosure

More than 40 percent of existing nonresidential buildings were constructed prior to California's first adoption of the Title 24 Standards[4]. Oceanside includes 28,142 acres; non-residential land uses inlcude 1,122 acres of commercial uses (11.5 percent), 54 acres of office space (0.2 percent), and 992 acres of industrial uses (3.5 percent).[5] Benchmarking and time-of-sale disclosure of energy use can increase the efficiency of the City's existing commercial and industrial building stock by increasing awareness of energy saving retrofits. There are 2,905 brick-and-mortar businesses in Oceanside. Energy use associated with these businesses is accounted for in the Commercial and Industrial Energy Use sectors (approximately 201,000 MT CO_2e in 2013). Studies by the U.S. EPA found that benchmarking energy use resulted in an average annual savings of 2.4 percent per year for the first three years.

Strategies

- Promote use of building energy use benchmarking using tools such as ENERGY STAR Portfolio Manager. Additionally promote SDG&E's San Diego Retrocommissioning Program for buildings with more than 50,000 square feet of air-conditioned space.[6]
- Promote disclosure of building energy use and energy use benchmark scores at the time-of-sale of non-residential real estate.

[4] California Energy Commission. Existing Buildings Energy Efficiency Action Plan (CEC 2015a).
[5] City of Oceanside Jurisdictional Runoff Management Plan. June 2015.
[6] Assembly Bill 802 requires that all businesses with more than 50,000 square feet of gross floor area participate in building energy benchmarking with ENERGY STAR Portfolio Manager. Measure E5 will require all brick-and-mortar businesses to participate regardless of gross floor area.

E5: Non-Residential Building Energy Benchmarking and Disclosure

GHG Reduction – Not Quantified
Benchmarking and disclosure remains voluntary.

Co-Benefits:

Water and Wastewater

Water systems need energy for water extraction, conveyance, treatment, distribution, and end uses. Drinking water may be pumped to the treatment plant, treated, and then pumped again to consumers. Treatment of wastewater and storm water also requires energy use. In areas where fresh water is scarce, drinking water may be transported long distances and over a high elevation, requiring extremely high-energy use. According to the CEC, this water-related energy consumes 19 percent of the state's electricity and 32 percent of statewide natural gas (California Department of Water Resources 2017). General strategies for reducing energy use associated with the water and wastewater sectors include increasing the efficiencies of local water and wastewater treatment and distribution facilities, reducing reliance on imported water sources, and reducing overall water use.

Water distribution and wastewater treatment account for approximately 4 percent of Oceanside's community GHG emissions. To reduce emissions from this sector, the CAP includes several additional measures to reduce indoor and outdoor water consumption.

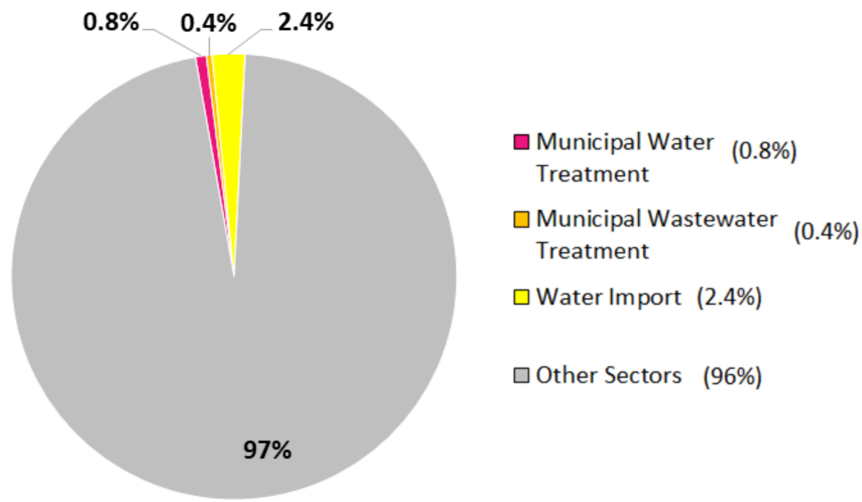


Figure 10 Water Sector Emissions Relative to Total Community Emissions

Measures

- W1—Implementation of the Water Conservation Master Plan
- W2—Non-Residential Water Use Benchmarking and Disclosure
- W3—Local Water Supply Development

Measure W1: Implementation of the Water Conservation Master Plan

The 2009 Water Conservation Act (SB X7-7) set an overall goal of reducing per capita urban water use by 10 percent by 2015 and by 20 percent by 2020. Additionally SB X7-7 required each urban water supplier to develop water use targets and update local urban water management plans to discuss per capita water use and water use targets. The City Water Conservation Master Plan was adopted in 2011. The primary goal of the plan was to reduce water use rates targets from baseline levels of 171 gallons per capita per day to 137 gallons per capita per day in 2020.

A statewide drought began in the winter of 2011-2012. In 2015, the Governor issued EO B-30-15, which directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce overall water usage by 25 percent and called on local water agencies to adjust their rate structures to discourage wasteful practices. The State Water Resources Control Board established emergency conservation standards ranging up to 36 percent depending on the existing residential water use rates between June 2015 and February 2016. Based on existing residential water use rates, the conservation standard for Oceanside was established at 20 percent.

In April 2016, the City prepared a comprehensive update of the Water Conservation Master Plan. The updated Water Conservation Master Plan outlines measures necessary to comply with state requirements and evaluates additional potential measures to reduce water use.

Following winter rains of 2016-2017, the drought state of emergency was lifted in April 2017 for nearly all Counties. Although the drought has ended, the Governor directed the State Water Resources Control Board to retain water conservation targets in an effort to “make conservation a way of life in California.”

Strategies

Table 10 summarizes water conservation measures included in the City’s 2016 Water Conservation Master Plan.

Table 10 City Water Conservation Master Plan Measures

Measure	Measure Description
Measures Adopted in the Original Water Conservation Master Plan	
Water Loss	Maintain a thorough annual accounting of water production, sales by customer class, and quantity of water produced but not sold (non-revenue water). In conjunction with system accounting, include audits that identify and quantify known legitimate uses of non-revenue water in order to determine remaining potential for reducing water losses.
Single Family Indoor Water Surveys	Indoor and outdoor water surveys for existing single-family residential customers. Target those with high water use and provide a customized report to owner.
High Efficiency Faucet Aerator, Showerhead, and Soil Moisture Sensor Giveaway	Utility would buy showerheads, kitchen and bathroom faucet aerators, and soil moisture sensors in bulk and give them away at Utility office or community events.
Residential Clothes Washer Rebate	Provide a rebate for efficient washing machines to single-family homes and apartment complexes that have common laundry rooms. It is assumed that the rebates would remain consistent with relevant state and federal regulations (Department of Energy, Energy Star) and only offer the best available technology.
Residential Outdoor Water Surveys	Outdoor water surveys offered for existing customers. Prioritize those with high water use and provide a customized report on how to save water.

Table 10 City Water Conservation Master Plan Measures

Large Landscape Outdoor Water Audit	Outdoor water audits offered for existing large landscape customers. Prioritize those with high water use and provide a customized report on how to save water. All large multifamily residential, commercial, industrial and institutional, and public irrigators of large landscapes would be eligible for free landscape water audits upon request.
Large Landscape Water Budgeting/Monitoring	Website that provides feedback on irrigation water use (budget vs. actual). Individual customer interface and portal for additional analytics.
Rotating Sprinkler Nozzle Rebates	Provide rebates to replace standard spray sprinkler nozzles with rotating nozzles that have lower application rates.
Provide Rain Barrel Incentive	Provide incentive for installation of residential rain barrels.
Top Water Users Program	Top water customers from each category would be offered a professional water survey that would evaluate ways for each to save water and money. The surveys would be for high volume users (i.e., accounts that use more than 5,000 gallons of water per day), such as hotels, restaurants, stores, and schools.
Commercial, Industrial and Institutional Rebates to Replace Inefficient Equipment	Program to provide rebates for a standard list of water efficient equipment. Included per current SoCal WaterSmart program are the following devices and base rebate amounts: Premium High-Efficiency Toilets, Ultra Low and Zero Water Urinals, Plumbing Flow Control Valves, Connectionless Food Steamers, Air-cooled Ice Machines, Cooling Tower Conductivity Controllers, Cooling Tower pH Controllers, Dry Vacuum Pumps, and Laminar Flow Restrictors.
Public Information	Public information includes the following: conservation print media; electronic conservation options/web site/social media; speakers bureau/event participation; billing report educational tools; media campaigns, such as “Take Control of your Controller;" recognition programs for water savings by residences, apartments, businesses program; outdoor residential focused public awareness information program and efficient outdoor use education and training programs; training for landscape maintenance workers, networking with landscaping industry, landscape water calculator, and climate appropriate demonstration gardens.
Model Water Efficient Landscape Ordinance	Adopt the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO). MWELO promotes efficient landscapes in new developments and retrofitted landscapes while increasing water efficiency standards for new and retrofitted landscapes through more efficient irrigation systems, , on-site storm water capture, and by limiting the portion of landscapes that can be covered in turf.
Measures Adopted in the 2016 Water Conservation Master Plan Update	
Automated Meter Infrastructure (AMI)	City will install AMI meters and provide a means of viewing daily consumption inside their home/business either through the internet or separate device. The AMI system would, on demand, indicate to the customer and Utility where and how their water is used, facilitating water use reduction and prompt leak identification. Also require that larger or irrigation customers install such AMI meters.
Require Plan Review for New Commercial, Industrial, and Institutional	Require plan reviews for water use efficiency for all new business customers.
Promote High Efficiency Pre-Rinse Spray Valves	Provide free spray rinse valves and possibly free installation operation in restaurants, commercial kitchens, grocery stores, and other locations.
School Education	Work with local school districts to develop classroom programs to promote water use efficiency education. Consider poster contests, etc. Some programs would require dedicated utility staff to assist and present.
Incentive for Recycled Water Conversions	Provide incentives for recycled water conversion.
Ag Water Audit Program	Water audit offered for existing agricultural customers. Those with high water use are targeted, offered a survey, and provided a customized report on how to save water.

W1: Implementation of the Water Conservation Master Plan

GHG Reductions Achievable by Measure

2020:
268 MT CO_2e

2030:
909 MT CO_2e

2040:
1,610 MT CO_2e

Co-Benefits: 

Measure W2: Non-Residential Water Use Benchmarking and Disclosure

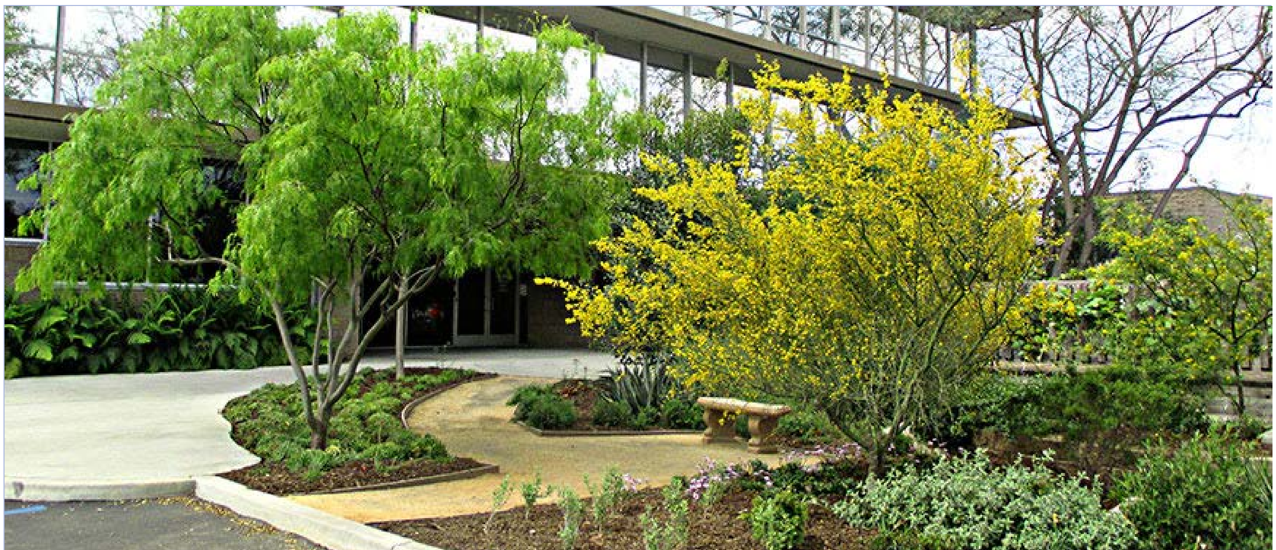
In 2016, the U.S. EPA added water consumption tracking to the Portfolio Manager benchmarking tool. Similar to benchmarking energy use, benchmarking and time-of-sale disclosure of water use can increase the efficiency of the City's existing commercial and industrial building stock by increasing awareness of water saving retrofits.

Strategies

- Promote use of building water consumption benchmarking using tools such as Portfolio Manager.
- Promote disclosure of building water consumption and water consumption benchmark scores at the time-of-sale of non-residential real estate.

W2: Non-Residential Building Water Consumption Benchmarking and Disclosure

GHG Reduction – Not Quantified
Benchmarking and disclosure remains voluntary.



Co-Benefits:

Measure W3: Local Water Supply Development

As discussed previously, water systems consume energy for water extraction, conveyance, treatment, distribution, and end uses. Due to southern California's reliance on imported water, water is typically transported long distances and thus requires extremely high-energy use. Following use, wastewater is generally recaptured, retreated, and then discharged to the environment. Through additional treatment, wastewater may be processed to meet standards for reuse. Water recycling does not involve water extraction or conveyance and therefore requires substantially lesser energy use.

Oceanside is a member of the North San Diego County Water Reuse Coalition (Coalition), which seeks to convert facilities for recycled water service, increase recycled water storage capacity, connect discrete recycled water systems to one another, distribute recycled water to effectively meet recycled water demands, and replace potable water uses with recycled water components wherever appropriate. Previous efforts in Oceanside have included development of recycled water infrastructure at the San Luis Rey Water Recycling Facility to supply recycled water for use at the Oceanside Municipal Golf Course and Whelan Lake. Additionally, implementation of the Water Conservation Master Plan includes the provision of incentives such as reduced rates for customers who use recycled water. As identified in the City's Recycled Water Master Plan, infrastructure at the San Luis Rey Water Reclamation Facility can treat up to 3.0million gallons per day to meet standards for non-potable uses. Infrastructure improvements to the San Luis Rey Water Reclamation could greatly increase the availability of recycled water. The CAP goal is for to offset 3.0 million gallons per day of potable water with recycled water by the year 2025.

Strategies

- Identify and implement capital improvements to the San Luis Rey Water Reclamation Facility that increase the supply capacity of recycled water that meets Title 22 requirements for unrestricted use to at least 3.0 million gallons per day by 2025; 5.5 million gallons per day by 2035, and 7.5 million gallons by 2045.

W3: Local Water Supply Development

GHG Reductions Achievable by Measure		
2025: 2,102 MT CO_2e	2035: 3,971 MT CO_2e	2045: 5,608 MT CO_2e

Co-Benefits:

Solid Waste

The disposal of solid waste in landfills produces GHG emissions (primarily CH_4) from decomposition of organic matter. Additional transportation emissions are associated with the collection and export of solid waste. The City contracts with Waste Management for its solid waste collection and disposal needs.

Solid waste disposal accounts for approximately 4 percent of Oceanside's community GHG emissions. Due to longstanding conservation and recycling programs, Oceanside achieved a 57 percent solid waste diversion rate in 2010 and a 67 percent solid waste diversion rate in 2016.[7] Oceanside has continued to exceed CalRecycle target disposal rates. Whereas the target daily residential waste is 6.3 pounds per person, the City has achieved a rate of approximately 4.2 pounds per person (CalRecycle 2018). Whereas the target daily commercial waste is 29.4 pounds per employee, the City has achieved a rate of approximately 17.5 pounds per employee (CalRecycle 2018).

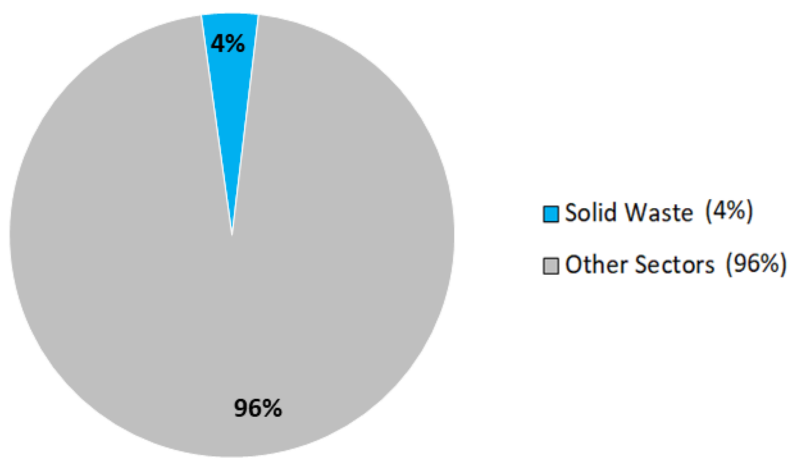


Figure 11 Solid Waste Sector Emissions Relative to Total Community Emissions

Measures

- SW1—Implementation of Zero Waste Strategic Resource Plan
- SW2—Beyond 2020 - Enhanced Waste Diversion and Organics Waste to Energy/Biosolids Master Plan~~Cogeneration~~

[7] Oceanside Zero Waste Strategic Resource Management Plan. June 2012.

Measure SW1: Implementation of Zero Waste Strategic Resource Plan

On August 25, 2010, Oceanside adopted a Zero Waste Resolution (Resolution Number 10-R0636-1) with the goal to achieve 75 to 90 percent solid waste diverson by 2020. In~~The~~ 2011, the Solid Waste Diversion Act (AB 341) established a state policy goal of 75 percent of solid waste be source reduced, reused, recycled, or composted by 2020. Additionally, AB 341 established commercial recycling requirements and directed CalRecycle to provide recommendations on legislation on how to achieve the 75 percent waste diversion goal.

The City had achieved a 57 percent solid waste diversion rate by 2010. Following adoption of AB 341, the City adopted a Zero Waste Strategic Resource Management Plan in June of 2012. ~~Parallel to State goals, t~~The Plan established a 75 percent to 90 percent solid waste diversion goal by 2020 with direction to update the Zero Waste Plan in 2022. The Plan discussed current waste collection services, inventoried local existing solid waste recycling facilities and outreach efforts, and identified areas for improvement. Key recommendations of the Plan are to develop food waste reduction programs through food donors and food banks ~~recycling though food banks~~, provide incentives for producer "cradle-to-cradle" takeback programs, develop reuse partnerships and a reuse warehouse, expand composting services and introduce food waste recycling services ~~composting~~, expand recycling education and outreach, and develop partnerships with local businesses. The plan also identified a~~n aspirational~~ goal of ultimately achieving the international standard for Zero Waste Community of 90 percent solid waste diversion.

Strategies

Table 11 summarizes zero waste measures included in the City's 2012 Zero Waste Strategic Resource Management Plan.

Table 11 Zero Waste Strategic Resource Management Plan Measures

Measure Description	Implementation Status
Phase 1 (2012–2017) Year 1	
Successfully implement new single-stream recycling program to increase recycling participation through the standardization of services and collection containers.	Complete
Update the City's recycling ordinance and provide technical assistance to businesses to comply with the AB 341 State mandatory commercial recycling program.	Ongoing
Place recycling containers at public facilities wherever trash containers are located, phased (only highest use coastal areas).	Ongoing
Expand education outreach regarding the CalGreen, which requires a minimum a 65 percent recycling rate.	Ongoing
Develop and adopt an extended producer responsibility resolution to support phasing out toxic products and products that cannot be reused, recycled, or composed.	Pending
Develop a Plastic Bag Reduction Ordinance coordinated with Solana Beach and other nearby jurisdictions.	Implemented by State Measure (SB 270)
Support and expand school composing, commercial on-site composting, and home composting programs. Educate all landscapers working in the City about the cost savings and other benefits of using composting facilities.	Ongoing (Love Your Planet Program)
Support and expand reuse opportunities in Oceanside.	Ongoing (CurbUp Program)
Waste Management to conduct a waste generation/characterization study to provide a solid baseline for measuring progress toward its Zero Waste Goal.	Complete (Organics Feasibility Study)

Table 11 Zero Waste Strategic Resource Management Plan Measures

Measure Description	Implementation Status
Phase 1 (2012-2017) Years 2-5	
Adopt Plastic Bag Reduction Ordinance.	Implemented by State Measure (SB 270)
Develop a program for business and institution waste reduction services that includes: workshops tailored to specific industries, waste audits, technical assistance, educational materials, and a recognition program. Medium and large businesses and institutions could be provided expert support and funding to prevent waste, reduce operating costs, and use all resources more efficiently. These services would be offered through the Green Oceanside Campaign and would be designed according to principles of community-based social marketing for sustainability.	Ongoing (~~Green Oceanside Business Network~~Unified Environmental Inspection Program)
Develop and adopt a construction and demolition recycling ordinance.	Implemented by State Measure (2016 Title 24)
Enhance outreach, education, training, and enforcement/reinforcement programs.	Ongoing
Place recycling containers at all public facilities wherever trash containers are located phased in as soon as possible. (public parks, shopping malls, and transportation depots).	Ongoing
Develop and adopt an environmental preferable purchasing program.	Complete
Develop list on City website of businesses or nonprofits that will take back products and packaging from customers that are otherwise difficult to reuse, recycle, or compost locally.	Ongoing
Develop and adopt take-back policies for sharps, mercury batteries, light bulbs, and pharmaceuticals.	Complete
Develop plans and timelines for implementing residential and/or commercial food scrap programs. Programs for food scrap diversion should give precedence to the following hierarchy: prevent food waste, feed people, convert material to animal feed and/or rendering, and composting/anaerobic digestion.	~~Complete~~Ongoing (Organics to Energy Biosolids Master Plan~~Feasibility Study~~)
The City and Waste Management should work with a reuse collaborative to develop a reuse warehouse to help sort and store products, and absorb the ebb and flow of products that are collected prior to distribution. Explore need and interest in Reuse Warehouse and other collaborative ventures or services to expand reuse businesses and nonprofits.	~~Pending~~Ongoing
Implement the above policies and programs over first five years after adoption of Zero Waste Strategic Resource Management Plan	Ongoing
Phase 2 (2017–2022)	
Support the development of one or more Resource Recovery Parks in the region.	Pending
Develop take-back policies or industry-sponsored programs for diapers.	Pending
Evaluate options for going beyond composting of just vegetative food scraps.	~~Pending~~Ongoing (Biosolids Master Plan)
Evaluate progress towards Zero Waste by 2020 and develop strategy on how to address next solid waste and recycling contract.	Pending

SW1: Implementation of Zero Waste Strategic Resource Plan

GHG Reductions Achievable by Measure

2020:
10,331 MT CO_2e

Co-Benefits:

Measure SW2: Beyond 2020 - Enhanced Waste Diversion

Between 2010 and 2015, statewide recycling rates have ranged from 47 to 50 percent (CalRecycle 2017). As discussed previously, the City had achieved a 67 percent solid waste diversion rate by 2016. Due to continued efforts associated with the Zero Waste Resource Management Plan, solid waste diversion had increased to 71 percent as of late 2016. Although local recycling rates are well above statewide averages, further opportunities still exist; organic materials such as paper, plant trimmings, food waste, textiles, and manures still comprise a substantial portion of the City's landfilled waste.

Additional measures that can reduce disposal of organic materials in landfills includes (1) increased outreach and incentives for residential and commercial recycling, (2) source reduction of organics, (3) reduced barriers to composting, and (4) further development of local facilities capable of receiving and/or processing organics for beneficial reuse (e.g. for compost and renewable energy via biogas cogeneration facilities). These facilities include those with anaerobic digestion capacity such as the City's San Luis Rey Water Reclamation Facility.

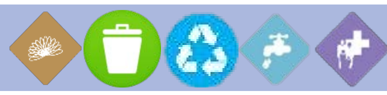
Strategies

- Continue to promote and implement programs, policies, and services for source reduction, material/product reuse, recycling, composting, and system/product redesign opportunities through the Green Oceanside Campaign and Zero Waste program.
- Reduce edible food waste generation through the implementation of food donation programs and services.
- Develop infrastructure to process recoverable excess foot such as the Green Oceanside Kitchen at El Corazon.
- Prepare and implement a plan to divert organic waste from landfills to local facilities capable of receiving and/or processing organics for beneficial reuse (e.g. for compost and renewable energy via biogas cogeneration facilities). These facilities include those with anaerobic digestion capacity such as the City's San Luis Rey Water Reclamation Facility.
- Divert waste locally to minimize transportation emissions.
- Co-locate local waste facilities with compatible end products to minimize transportation emissions.
- In 2020, the City will reevaluate the effectiveness of the Zero Waste Resource Management Plan and draft an update to the Zero Waste Resourse Management Plan that will reset targets to ensure a minimum 90 percent diversion rate in the near future. ~~'s programs as well as the City's solid waste diversion rate. Through this effort, the City may establish new baseline diversion rates for consideration such as 80% by 2025, 85% by 2030, and 90% by 2035.~~

SW2: Beyond 2020 - Enhanced Solid Waste Diversion

GHG Reductions Achievable by Measure	
2030: 11,016 MT CO_2e	2035: 16,524 MT CO_2e

Co-Benefits:



Transportation and Land Use

On-road transportation sources account for nearly half of Oceanside's community GHG emissions. The following measures aim to reduce these emissions by promoting a compact urban landform, promoting increased deployment of low emission vehicles, and furthering automotive alternatives–including options for biking, walking, and public transit.

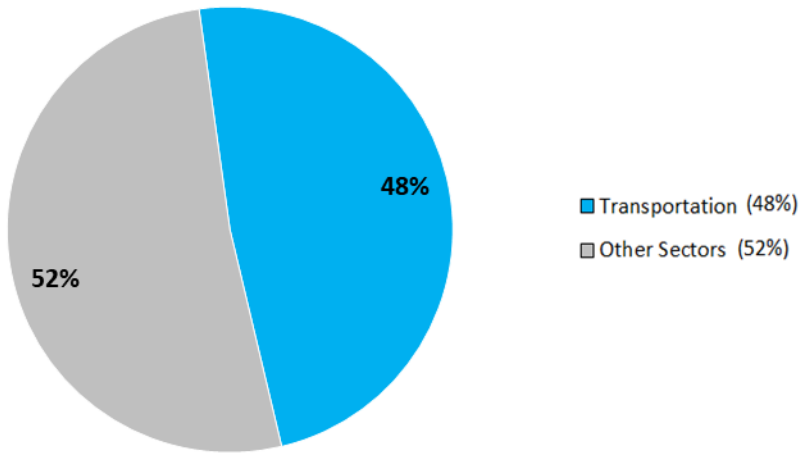


Figure 12 Transportation Sector Emissions Relative to Total Community Emissions

Measures

- TL1— Smart Growth Policies
- TL2—Electric Vehicle Promotion
- TL3—Preferential Parking Spaces for Clean Air Vehicles
- TL4—Expand Complete Streets Programs
- TL5—Transportation Demand Management Plans

Measure TL1: Smart Growth Policies

By designing communities that better integrate the connections between land use and transportation planning, the City can reduce vehicle trip lengths (vehicle miles traveled) and encourage alternative modes of transportation. The term “smart growth” refers to a compact, efficient, and environmentally sensitive urban development pattern. Smart growth focuses future growth and infill development close to employment, services, and public facilities to maximize the use of existing infrastructure and preserve open space and natural resources. Smart growth is characterized by more compact, higher density development in urbanized areas throughout the region. These areas are walkable, bike-friendly, near public transit, and promote good community design, resulting in housing and transportation choices for those who live and work in these areas. As population increases, smart growth development characteristics can often be the difference between a sense of overcrowding and a feeling of vibrancy.

SANDAG performed previous studies of land use, housing, employment, and transit system densities to identify seven types of Smart Growth Opportunity Areas (SGOA) throughout the County of San Diego. Types of SGOAs include metropolitan centers, urban centers, town centers, community centers, rural villages, mixed-use transit corridors, and special use centers. Existing SGOAs within Oceanside include[8]:

- The town center generally located north of Seagaze Drive, south of Harbor Drive, and west of Interstate 5;
- The mixed-use transit corridor along South Coast Highway between Mission Avenue and the Buena Vista Lagoon (west of Ditmar Street and east of the North County Transit District [NCTD] Coaster line); and
- The mixed-use transit corridor along Oceanside Boulevard between Interstate 5 and Canyon Drive.

SANDAG’s *Smart Growth Concept Map* also identifies three *potential* SGOAs in Oceanside[9]:

- A community center centered within ¼-mile of the intersection of Oceanside Boulevard and El Camino Real;
- The community center centered within ¼-mile of the intersection of Oceanside Boulevard and Rancho Del Oro Drive; and
- The community center centered within ¼-mile of the intersection of Oceanside Boulevard and Melrose Drive.

[8] Town Centers are areas with a mix of office and commercial development, including residential mixed-use, that draw from their subregional areas and are served by regional or corridor transit lines, local bus services or shuttle services. SANDAG’s minimum target densities for town centers are generally 20 dwelling units per acre and 30 employees per acre.

Mixed-use transit corridors are linear corridors with residential, commercial, and mixed-use development along the corridor, as well as similar development within one or two blocks of the arterial. Mixed-use transit corridors must be served by high-frequency bus service. SANDAG’s minimum target density for mixed-use transit corridors is 25 dwelling units per acre.

[9] Community centers are areas with residential, commercial, and mixed-use development that serve the surrounding neighborhoods, with high-frequency local bus service. SANDAG’s minimum target density for mixed-use transit corridors is 20 dwelling units per acre.

Strategies

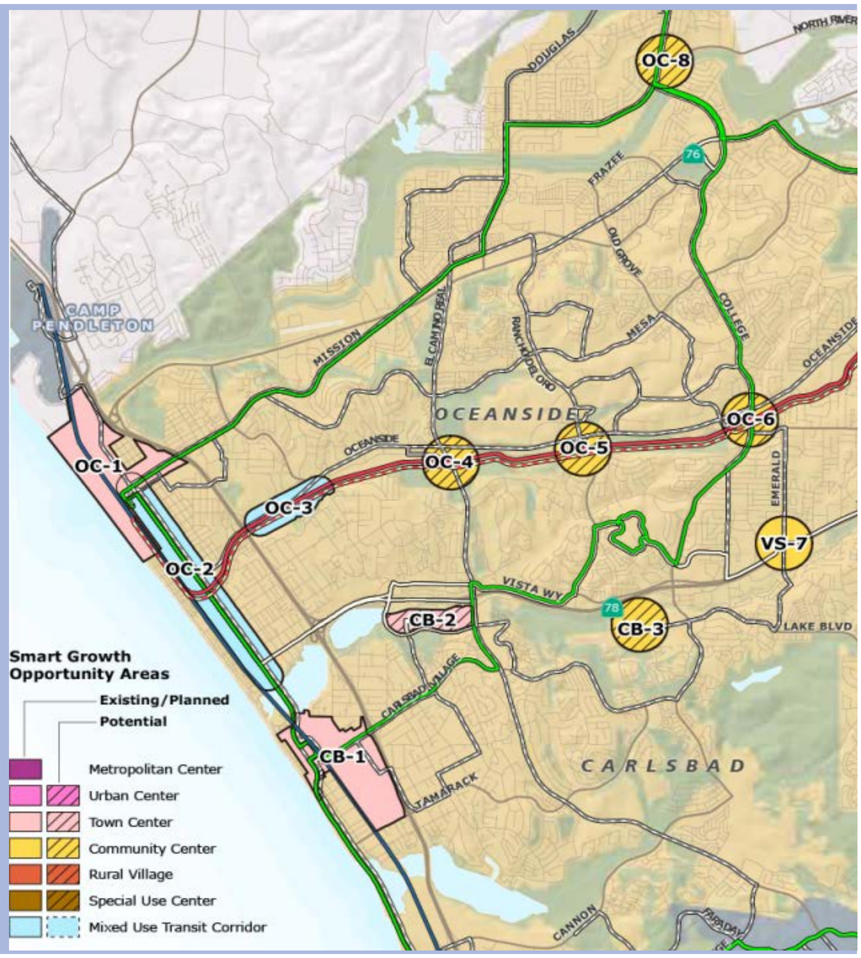
- The City will establish a smart growth development goal of locating the majority of new housing units and employment generating land uses developed between 2017 and 2030 within existing and potential SGOAs. The City will assess land use development patterns annually and make results available to the public.
- The City will adopt policies that accommodate and incent development within SGOAs to achieve the SGOA development goals. Policies will be relaxed or reinforced to achieve the smart growth development goal and may include, but are not limited to, streamlined permitting and review in for development in SGOAs, public infrastructure improvements, zoning amendments, relaxed development fees, development requirement variances (such as parking requirements, floor area ratio requirements, etc.), and development density credits.

TL1: Smart Growth Policies

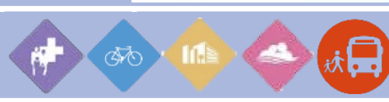
GHG Reductions Achievable by Measure

2020:
756 MT CO_2e

2030:
2,486 MT CO_2e



Co-Benefits:



Measure TL2: Electric Vehicle Promotion

Zero emission vehicles (ZEVs) include plug-in electric vehicles (EV), such as battery EV and plug-in hybrid EV, and hydrogen fuel cell vehicles. Use of ZEVs in place of traditional fossil fuel combustion engines results in substantial GHG reductions. ZEVs result in no direct tailpipe emissions. Grid electricity consumed by ZEVs results in approximately 40 percent of the emissions of a traditional fossil fueled vehicle. Additionally, the emissions associated with this electricity are forecasted to decline as renewable energy sources increase.

As of summer 2016, Californians drive over 230,000, or approximately 47 percent, of all ZEVs in the U.S (California Office of the Governor 2016). California ZEV Program goals include increasing ZEV market penetration to 1 million vehicles by 2020 (3.9 percent of passenger vehicles); 1.5 million by 2025 (5.4 percent of passenger vehicles); and 4.2 million by 2030 (14.1 percent of passenger vehicles) (California ARB 2017c). Oceanside can reduce barriers to ZEV market penetration through increased charging structure, incentives, and outreach. As identified in SANDAG's San Diego Regional Plug-in EV Readiness Plan, expansion of residential charging station infrastructure is most critical, followed by workplace, retail, and public charging stations (SANDAG 2014). CAP goals include increasing local ZEV market share to 20 percent of passenger vehicles by 2030.

Strategies

- Require all new single-family residential developments to include prewiring of the site with a dedicated 240-volt branch circuit to allow for future installation of a level 2 charging circuit and electrical retrofits to support EV charging stations at an interior or exterior space such as the garage or driveway.
- Require all single-family residential solar PV systems installations to include prewiring of the garage with a dedicated 240-volt branch circuit to allow for installation of a level 2 charging circuit and electrical retrofits to support EV charging stations.
- Consistent with state requirements for pre-wiring for level 2 charging circuits in multi-family developments (currently 10 percent of all resident surface parking), [10] require charging stations to be installed at half of all pre-wired spaces.
- Consistent with state requirements for pre-wiring for charging circuits in commercial and industrial developments, require charging stations to be installed at half of all pre-wired spaces.
- Promote incentives for purchase of ZEVs such as available federal tax credits (up to $7,500) and available rebates offered through the California Clean Vehicle Rebate Project (up to $2,500).
- Provide permit fee waivers for construction related solely to the installation of EV charging station circuitry such as electrical rewire permitting, electrical service upgrade permitting, or other miscellaneous permitting that is typically charged at an hourly rate.

[10] The 2017 Energy Code requires prewiring in all one- and two-family dwelling and townhouses with attached garages and 3 percent of all parking spaces for multi-family dwellings with greater than 17 dwelling units.

- Allow by-right sale of ZEV vehicles within all retail-oriented commercial zones.
- Incentivize installation of direct current fast charging stations at gas stations and other retail.
- Establish public-private partnerships to increase charging infrastructure at existing office and industrial facilities.
- Promote commercial businesses and industry that provides EV charging stations and incentives for EV use to employees through added marketing and benefits from City's Green Oceanside Business Network program.
- Collaborate with local EV retailers to establish an Aggregated Demand EV Program. To implement the program, the City will advertise to the community on behalf of local vendors in exchange for negotiated for discounted "bulk pricing."

TL2: Electric Vehicle Promotion

GHG Reduction Achievable by Measures TL2 & TL3

2020:	2030:
1,496 MT CO_2e	4,923 MT CO_2e

Co-Benefits:

Measure TL3: Preferential Parking Spaces for Clean Air Vehicles

Increasing the number of preferential parking spaces for clean air vehicles such as ZEVs and other alternative-fuel vehicles will encourage people to transition from conventional vehicles to zero or low emission vehicles. This measure can act as a support and boost to the implementation of Measure TL2.

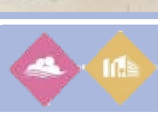
Strategies

- Require commercial and industrial developments to incorporate 12 percent designated parking for clean air vehicles.
- Provide incentives through Green Oceanside Business Network to businesses that designate additional parking for clean air vehicles.

TL3: Increase Number of Preferential Parking Spaces for Clean Air Vehicles

GHG Reduction – Calculated along with TL2. See above.

Co-Benefits:



Measure TL4: Expand Complete Streets Programs

Complete streets are streets designed and operated to enable safe access for all modes of travel, including walking, biking, using public transit, and driving cars or commercial vehicles. Improving pedestrian and bicycle infrastructure encourages residents to walk or bicycle to work and to various destinations within town as opposed to using their personal vehicles, thereby reducing vehicle use. A network of complete streets with bicycle lanes and sidewalks, and connections to off-street multiuse pathways that are safe and convenient are crucial to promoting walking and bicycling use. Bicycle routes should be well marked and separated from motor vehicle lanes where possible. The City prepared a Bicycle Master Plan in 2008 and a Pedestrian Master Plan in 2009 to identify opportunities to improve bicycle and pedestrian networks.

Strategies

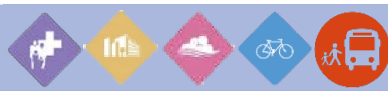
- Establish criteria for identifying opportunity sites for new off-street multiuse pathways along transportation corridors. Incorporate these criteria into the next update to the City's Bicycle Master Plan, Pedestrian Master Plan, and General Plan Circulation Element.
- Require new developments to provide connections and/or extensions of the bicycle and pedestrian networks where applicable. Other bicycle improvements would be supported by TL4—Transportation Demand Management Plans and General Plan Circulation Element Policies.
- Establish complete streets criteria checklist for Capital Improvements Projects (CIP). Require that all CIP roadway construction and maintenance projects be reviewed for potential opportunities to incorporate complete street improvements. The complete streets criteria checklist shall establish criteria for identifying potential opportunities to convert signalized intersections to roundabouts.
- Periodically update the Citywide Traffic Signal Priority List to maintain optimized traffic signal timing that reduced fuel consumption.
- Collaborate with NCTD and neighboring jurisdictions to develop a neighborhood electric vehicle (NEV) implementation plan. The plan shall consider a coastal zone NEV circulator shuttle system and a NEV shuttle loop connecting the Ocean Ranch Business and Technology Center to the Rancho Del Oro Sprinter Station, as well as other opportunities to reduce first-mile-last-mile barriers to transit use.
- Collaborate with Oceanside Unified School District to promote walking, bicycling, or carpooling to school. As applicable, consider opportunities to provide incentives or infrastructure improvements that will encourage walking, bicycling, or carpooling to school.

TL4: Expand Complete Streets Programs

GHG Reduction – Not Quantified

Goals will be established as part of the next update to the City's Bicycle and/or Pedestrian Master Plan.

Co-Benefits:



Measure TL5: Transportation Demand Management Programs

Transportation Demand Management (TDM) refers to programs and strategies that manage and reduce congestion during peak traffic hours by encouraging the use of transportation alternatives. The City is able to promote TDM strategies through expanded complete street infrastructure; however, site design and employer participation are critical for overcoming first/last mile barriers to alternative modes of travel. A TDM Ordinance can increase implementation of TDM measures and thereby reduce vehicle use associated with new commercial and industrial developments.

Common examples of TDM measures implemented during site design include convenient connections to nearby transit stops and off-site walkways, safety improvements to nearby pedestrian pathways (e.g. curb bulb-outs or speed tables at road crossings), street lighting, the off-site network, transit stops, secure bicycle parking, bicycle end-trip facilities such as showers and lockers, preferential carpool/vanpool parking, and improvements to adjacent transit stops such as shelters, benches, or other street furniture. Other examples of TDM measures implemented by employers include providing education of the transit network, employee carpool/vanpool matching programs, parking pricing and/or cash-out, bicycle-sharing programs, alternative work schedules, telecommuting, park-and-ride lots, and coordination with the NCTD. CAP goals include reducing VMT associated with new development by 10 percent.

Strategies

- Adopt a TDM Ordinance that requires new commercial and industrial developments, or commercial and industrial developments that undergo a permitted renovation affecting more than 10,000 square feet, that would generate more than 100 vehicle commute trips per day to prepare a TDM Plan. The City shall prepare and maintain a checklist of common TDM measures to streamline preparation of TDM plans.
- Conduct surveys of business to determine existing TDM measure implementation rates. Require businesses complete survey during business license renewal. Provide rebates for implementation of TDM measures such as addition of bicycle parking or transit stop shelter improvements.
- Provide incentives and marketing promotion through Green Oceanside Business Network for businesses that incorporate TDM measures.

TL5: Transportation Demand Management Programs

GHG Reductions Achievable by Measure

2020:	2030:	2040:	2050:
675 MT CO_2e	2,222 MT CO_2e	3,668 MT CO_2e	4,161 MT CO_2e

Co-Benefits:

Agriculture and Forestry

In addition to measures that reduce emissions, the City intends to increase carbon sinks that absorb carbon dioxide from the atmosphere. Carbon capture, or carbon sequestration is the removal of carbon dioxide and other GHG emissions from the atmosphere; trees and other vegetation naturally assimilate carbon from the atmosphere into organic matter. When plants die, carbon stored as organic matter may decompose and be released back into the atmosphere or may accumulate in soils. In general, well aerated and saturated soils are conducive to decomposition, and dry or undisturbed soils are conducive to long-term carbon storage. Strategies to promote carbon capture and storage generally include (1) increased tree canopy, (2) preservation of agricultural lands, (3) sustainable soils management and limited vegetation clearing, and (4) application of compost-based soil ammendments.

Measures

- AF1—Urban Forestry Program
- AF2—Urban Agriculture and Community Gardens
- AF3—South Morro Hills Agricultural Lands Conservation Program
- AF4—Carbon Farming Program

Measure AF1: Urban Forestry Program

Urban tree planting sequesters carbon while also helping to cool an environment by providing shade and evapotranspiration (the movement of water from the soil and plants to the air). Trees planted near pavement can reduce the surface temperatures of streets and parking lots, and trees planted strategically near windows or roofs of buildings can effectively reduce interior temperatures, thereby reducing energy used for cooling. Based on data from SANDAG's Healthy Communities Assessment Tool, neighborhoods in Oceanside have between a 0.2 and 3.0 percent tree canopy cover, with an average of 1.4 percent canopy cover (SANDAG 2017). Oceanside's canopy is consistent with the average for cities in San Diego County (1.4 percent canopy cover). Oceanside neighborhoods with the least tree canopy coverage include the tri-city neighborhood, San Luis Rey community, and the Townsite neighborhood (also known as downtown). A Green Streets Ordinance can increase tree planting associated with new development and the City's Public Works Department can facilitate plantings along transportation corridors or other public rights-of-way. The City's Green Oceanside campaign can facilitate community events dedicated to tree plantings in public or private areas or within community gardens and schools. Typical street trees in Southern California sequester about 0.063 tons of carbon dioxide per tree per year less releases associated with maintenance and decomposition (Center for Urban Forest Research 2001). The CAP goals are to plant 200 trees each year on public rights-of-way and to require development projects to incorporate an annual average of 200 additional trees per year.

Strategies:

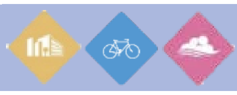
- Compile a street tree inventory that identifies all trees in public rights-of-way. Identify tree species that are drought tolerant, low maintenance, and do not pose safety risks. The tree species should contribute to neighborhood character.
- Adopt a Green Streets Ordinance that requires all new development projects to incorporate shade trees. Establish criteria for the number of shade trees. Criteria may reasonably be linked to metrics such as the number of residences, building area, or impervious area.
- Establish a green streets criteria checklist for CIP. Require that all roadway CIP roadway construction and maintenance projects be reviewed for potential opportunities to incorporate additional shade trees.
- Provide streamlined development review for projects that would incorporate additional tree installation on-site or within the community.
- Provide incentives through Green Oceanside Business Network and campaign that promote increased tree plantings.
- Include urban forestry in the Green Oceanside educational outreach program as a means of encouraging residents and business owners to expand tree canopy on their private property and within adjacent parkways in the public right-of-way.
- Establish public-private partnerships that support volunteer tree planting and stewardship efforts.
- Allow proposed development projects to mitigate climate change impacts through off-site tree planting and stewardship plans.

AF1: Urban Tree Planting Program

GHG Reductions Achievable by Measure

2020:	2030:	2040:	2050:
50 MT CO_2e	302 MT CO_2e	554 MT CO_2e	806 MT CO_2e

Co-Benefits:



Measure AF2: Urban Agriculture and Community Gardens

Urban agriculture is the growing, processing, and distribution of food through intensive plant cultivation in and around cities. Food that is grown locally requires less packaging, preservation, and transportation than imported foods and may reduce food waste. Urban agriculture can reduce the consumption of natural resources and GHG emissions associated with food production.

Community gardens, a type of urban agriculture, are pieces of land gardened collectively by a group of people. Community gardens can facilitate revitalization of underutilized lands, provide open space within compact communities, contribute to neighborhood character, promote physical activity, foster community interaction, and improve access to healthy foods for residents that lack the financial resources to purchase fresh or organic produce. Additionally, community gardens can help reduce the urban heat island effect, lessen urban run-off, improve air quality, increase access to composting opportunities, and provide “breathing room” within compact segments of communities.

Strategies:

- Adopt an Urban Agriculture Incentive Zone Ordinance consistent with Assembly Bill 551. The Urban Agriculture Incentive Zone Ordinance will establish an administrative process that allows local landowners to apply for reduced property taxes in exchange for converting unimproved or blighted property to agricultural uses.
- Establish a population ratio goal for community gardens within the City and ensure that community gardens are equally accessible to all members of the community.
- Identify potentially feasible site locations for urban agriculture and community gardens on public land or underutilized privately owned parcels. Potential opportunities include undeveloped open space, utility right of ways, conversion of portions of public parks, closure and conversion of redundant streets, or underdeveloped lots in residential neighborhoods.
- Create and implement a Community Garden Program through the Green Oceanside Campaign to designate community garden coordinators for each garden and provide guidance on appropriate design, maintenance, and operations of community gardens.
- Amend zoning regulations to allow for urban agriculture and community gardens in appropriate zones.
- Encourage the development of community gardens in conjunction with school sites or other institutional uses as both an educational and food resource.
- Provide incentives to multi-family developments that include community gardens for residents.
- Provide incentives to Green Oceanside Business Network members who participate or sponsor community garden projects.
- The City will promote urban agriculture, community gardening, and backyard-composting education through the Green Oceanside Campaign.

AF2: Urban Agriculture and Community Gardens

GHG Reduction – Not Quantified

Criteria would be established in the next update to the Community Facilities Element of the General Plan.

Co-Benefits:

Measure AF3: Agricultural Lands Conservation Program

Protecting agricultural lands from conversion to urban or rural residential development promotes smart growth infill developments, ensures open space remains available, and supports a healthy agricultural economy and resulting food security. A healthy and resilient agricultural sector is becoming increasingly important in meeting the challenges occurring and anticipated as a result of climate change. Recent University of California research estimates that land in agricultural and healthy open space use sequesters up to 70 times more carbon than any form of urban development (California Strategic Growth Council 2017). The California Strategic Growth Council established the Sustainable Agricultural Lands Conservation (SALC) Grant Program to fund plans and conservation acquisitions in order to avoid increases in emissions associated with the development of agricultural lands. Grants through the SALC Program are evaluated based on difference between property fair market value (price a developer may pay) and agricultural restricted value (price a farmer may pay). Through these grants, willing agricultural property owners are compensated for placing an easement on their agricultural property that limits future uses and extinguishes future development potential. As a result, the agricultural land is preserved and the property owner receives compensation that can make its continued use for agriculture more viable. The SALC Program requires a minimum 10 percent local funds match.

The City includes agricultural lands in the 3,450-acre Morro Hills Community (also known as South Morro Hills). Based on City surveys, agricultural production in Morro Hills is estimated to include approximately 700 acres of avocado trees, 400 acres of tomatoes plants, 400 acres of cut flowers, 150 acres of nut trees, 100 acres of bell pepper plants, and 415 acres of other agricultural products such as tropical fruit trees, lemons, limes, berries, wine grapes, brussel sprouts, and herbs. Due to the increasing real estate prices and potential challenges to the financial viability of several agricultural operations, pressure to open Morro Hills to development has increased in recent years. Proposed alternative uses for Morro Hills have included residential development or agriculture based tourism ("agritourism"). An agricultural easement program can preserve agricultural uses for future generations and avoid increased emissions associated with the development of agricultural lands for residential uses.[11]

Strategies:

- Collaborate with landowners to prepare agricultural easement grant applications to the SALC Program. Between 2020 and 2024, identify internal or external funding sources for minimum matching funds for up to 250 acres of agricultural preservation easements. Between 2025 and 2029, identify internal or external funding sources for minimum matching funds for up to 250 acres of agricultural preservation easements.

[11] Morro Hills is within the City boundary and therefore is assessed against potential upzone to residential. Rights to be extinguished would be calculated at the time of grant application. Avoided emissions are estimated based on the existing maximum allowable development density of one residence per 2.5-acre lot (0.4 units per acre) and the base density for single family zoning districts, 3.6 units per acre. Thus, conservation easements were estimated to preclude development of 3.2 residences per acre (1,600 total residences). Each precluded residence is estimated to avoid 8.1 MT CO_2E.

AF3: South Morro Hills Agricultural Lands Conservation Program

GHG Reductions Achievable by Measure

2030:
12,990 MT CO_2e

Co-Benefits:

Measure AF4: Carbon Farming Program

The term "carbon farm" refers to farms that are engineered to maximize carbon sequestration. Alternative management practices such as reduced tillage, cover cropping, organic farming, and reduced synthetic nitrogen fertilization (or replacement with compost-based fertilizers) have been demonstrated to result in quantifiable carbon sequestration (CEC 2009). Additional conservation measures include compost application, anaerobic digestion of waste, silvopasture, range planting, windbreak establishment, filter strips, conservation crop rotation, improved nutrient management, and multistory cropping. Base scenarios for demonstrative carbon farming practices indicate that application of compost topsoil can increase carbon sequestration by 14 MT CO_2e per hectare. Establishment of local carbon farms can demonstrate benefits of sustainable agriculture practices and thereby encourage other agricultural operations to incorporate these practices (Marin Carbon Project Carbon Farming Project 2016).

Strategies:

- Collaborate with agricultural landowners and provide incentives for the establishment of up to 50 acres of demonstration carbon farms by 2025.
- Expand the Green Oceanside Business Network to include members with agriculture-based businesses.

AF4: Carbon Farming Program

GHG Reduction – Not Quantified
The intent of this measure is to promote sustainable practices throughout the agricultural community. Reductions will be quantified once demonstrated sustainable practices and adoption rates are identified.

Co-Benefits:

Summary of the Reductions

Implementation and Effective Life of Measures

Each GHG reduction strategy is designed with a specific implementation timeframe, useful life, and horizon year. Implementation timeframes are generally summarized as near-term (0–2 years), mid-term (2–5 years), or long-term (5+ years). Once implemented the annual reductions achieved by a strategy are rarely static and may be either increase or diminish with time. Reductions achieved by strategies that remove barriers to emerging technologies (e.g., electric vehicle charging infrastructure) generally increase as the emerging technology becomes more independently competitive, while reductions achieved by measures that promote efficiency improvements (e.g., benchmarking) generally diminish as the remaining stock of unimproved buildings decreases. The end of the useful life of a strategy, or horizon year, refers to the point at which the strategy becomes standard for the industry, required by regulation, or the strategy no longer achieves additional GHG emission reductions.

For example, the City recently retrofitted streetlights with General Electric's LightGrid™ smart-grid light-emitting diode fixtures. This emerging technology was unveiled at the 2013 LightFair exhibition. The measure was identified by the City in 2014 and the implementation timeframe include a year for securing financing, contract negotiations, and fixture replacement. Thus, the initial implementation year was 2015. Over the useful life of this early adoption measure, GHG emission reductions will slowly decrease due to the cleaning of grid electricity (RPS). The horizon year of this measure would be the year in which similar technologies become standard for the industry.

The majority of CAP GHG reduction strategies would be implemented in the near-term. Strategies with delayed or partially delayed implementation include E1—Renewable Energy Procurement (long-term goal for 2030), W3—Local Water Supply Development (long-term goals for 2035 and 2045), SW2—Enhanced Waste Diversion (accelerates after 2020), and AF3—South Morro Hills Agricultural Lands Conservation Program (begins in 2020 and accelerates in 2025).

The majority of CAP GHG reduction strategies would achieve all reductions (i.e. reach the horizon year) by 2030. Strategies with long-term horizons include W1—Implementation of the Water Conservation Master Plan (horizon year is 2040), W3—Local Water Supply Development (long-term goals to 2045), TL4—Expand Complete Streets Programs (no definitive horizon), TL5—Transportation Demand Management Plans (no definitive horizon), AF1—Urban Forestry Program (no definitive horizon), and AF3—South Morro Hills Agricultural Lands Conservation Program (horizon year is 2055).

Reduced Forecast

Table 12 summarizes the emissions reductions achieved by implementation of all local reduction measures. As shown, the identified measures would reduce emissions by approximately 3 percent compared to the 2020 Adjusted BAU emissions and by 19 percent compared to the 2030 Adjusted BAU emissions. Certain reduction measures would continue to achieve further reductions throughout the forecast horizon while others exceed their useful life. For example, while agricultural preservation easements would be anticipated to last indefinitely; many solar panels installed prior to 2020 would likely begin to be removed by 2040. The reduction measures would continue to reduce emissions by approximately 24 percent as compared to the Adjusted BAU throughout the forecast horizon.

Table 12 Summary of Emissions Reductions by Sector

Sectors	Emissions Reductions (MT CO_2e)			
	2020	2030	2040	2050
Residential Energy	0 (0%)	31,503 (17%)	31,719 (17%)	31,750 (17%)
Commercial Energy	5,089 (3%)	53,666 (30%)	77,147 (33%)	99,899 (34%)
Industrial Energy	2,286 (5%)	21,021 (42%)	32,397 (48%)	44,356 (50%)
Transportation	4,633 (1%)	22,621 (7%)	23,227 (7%)	24,682 (8%)
Solid Waste	10,331 (24%)	21,346 (48%)	26,854 (61%)	26,854 (60%)
Water & Wastewater	268 (1%)	2,816 (11%)	5,586 (22%)	7,227 (28%)
Total Emissions Reduction	22,607 (3%)	152,973 (19%)	196,930 (23%)	234,768 (24%)
CO_2 Sequestration	*50*	*302*	*554*	*806*
Total Net Emissions Reduction	22,657	153,276	197,485	235,574

MT CO_2e = metric tons of carbon dioxide equivalent

Comparison to Reduction Targets

Table 13 summarizes the baseline emissions, as well as the reduced emissions after implementation of the state and local reduction measures. As discussed in Chapter 2, recent guidance from the 2017 Scoping Plan, is for local governments to achieve “emissions of no more than six MT CO_2e per capita by 2030 and no more than two MT CO_2e per capita by 2050” (California ARB 2017). Thus, state-aligned targets for interim years 2035, 2040, and 2045 roughly equate five, four, and three CO_2e per capita, respectively. The City has developed local GHG emission reduction goals that go beyond state-aligned targets to demonstrate its commitment to further long-term GHG reduction goals. Local reduction goals for interim years 2020, 2030, 2040, and 2050 equate to five, four, three, and two CO_2e per capita.

With incorporation of GHG reduction strategies, emission levels are anticipated to decrease from currently levels (5.8 CO_2e per capita) to approximately 5.0 CO_2e per capita in 2020 and 3.6 CO_2e per capita in 2030. These emission levels meet the state-aligned reduction targets of 10 CO_2e per capita in 2020 and 6 CO_2e per capita in 2030 and would meet local reduction goals.

As discussed previously, the majority of CAP GHG reduction strategies would achieve all reductions by 2030. After 2030, per capita emission levels would remain nearly constant through 2040 and would begin to increase again after 2040 due to continued commercial and industrial growth.

As shown in **Figures 13 and 14**, below, the City will meet their communitywide reduction goals from 2020 through 2035; however, additional reductions are needed to meet the 2040 through 2050 reduction targets. As the planning horizon of the City’s General Plan and other City conservation plans generally do not extend beyond 2035, provision of additional reduction measures to fully address emission levels in 2040 and 2050 may be speculative. The City may consider and establish additional reduction measures in subsequent updates to this CAP.

Table 13 Community Emissions and Targets Comparison

Metric	Emissions (MT CO_2e)							
	2013	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
City Population Forecast	170,361	177,840	181,356	184,941	188,597	188,857	189,117	189,377
City Employment Forecast	37,721	44,068	50,466	57,793	66,184	75,793	86,797	99,399
Total Service Population	208,083	221,908	231,822	242,734	254,781	264,650	275,914	288,776
Per Capita Adjusted BAU Emissions	5.8	5.1	4.7	4.4	4.4	4.6	4.9	5.1
Per Service Population Adjusted BAU Emissions	4.7	4.1	3.6	3.3	3.3	3.3	3.3	3.4
Adjusted BAU Emissions	984,012	904,088	845,114	810,293	837,064	869,434	921,234	967,458
Local Reductions	-	22,657	73,221	153,276	178,733	197,485	218,382	235,574
Reduced Forecast	-	881,431	771,893	657,017	658,331	671,949	702,852	731,884
Per Capita Reduced Forecast	-	5.0	4.3	3.6	3.5	3.6	3.7	3.9
Per Service Reduced Forecast	-	4.0	3.3	2.7	2.6	2.5	2.5	2.5
Oceanside Emissions Goals	**-**	889,200	816,101	739,764	660,090	566,570	472,792	378,754
Additional Reductions Needed	**-**	**Target Met**	**Target Met**	**Target Met**	**Target Met**	**105,379**	**230,061**	**353,130**

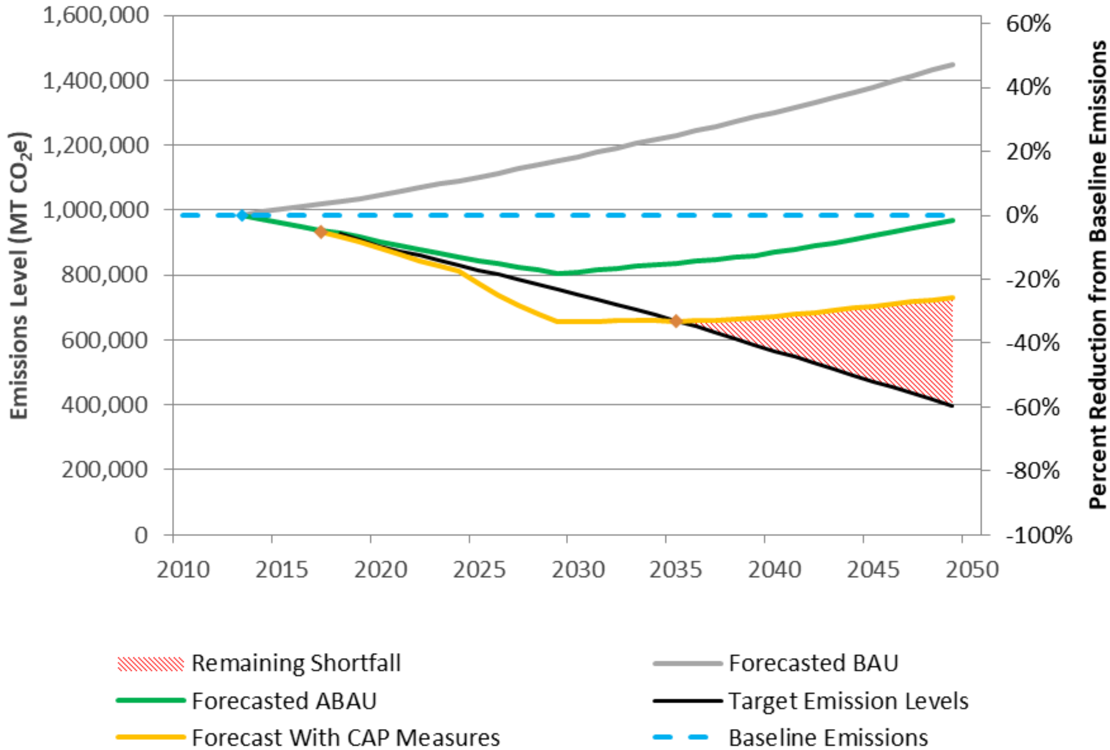


Figure 13 Reduced Community Emissions Forecast

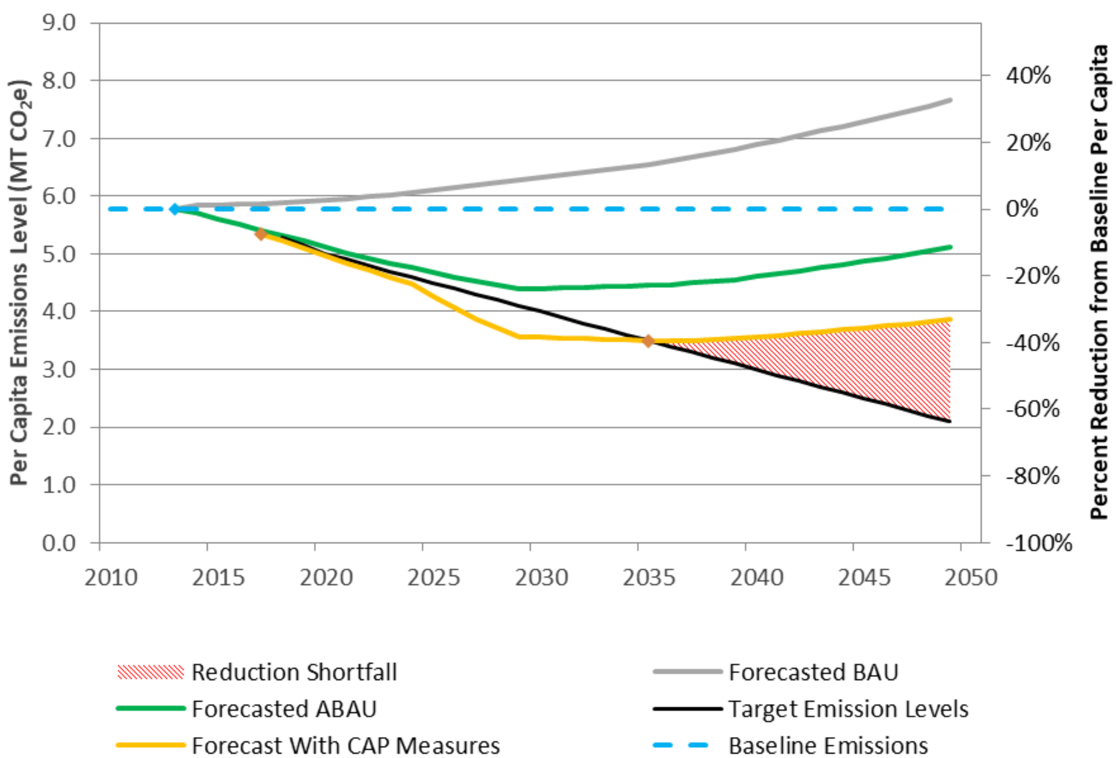


Figure 14 Per Capita Reduced Community Emissions Forecast

04 Implementation

Chapter 4 Implementation

This chapter describes how the CAP will be implemented. Success in meeting the City's GHG emission reduction goals requires cooperative and innovative actions by City officials, residents, local businesses, and other local government entities, such as the SANDAG, SDG&E, and NCTD. This chapter outlines key steps for the implementation of this CAP.

Administration and Staffing

Implementation of the CAP and recommended reduction measures requires ongoing management, oversight, and staffing. An interdisciplinary Climate Action Planning Team is proposed to support and guide the City's efforts to conserve energy and reduce emissions. The Climate Action Planning Team would include members from the following core departments, with other disciplines engaged as needed to ensure coordinated leadership in plan implementation: City Manager's Office, Development Services, Public Works, Water Utilities, Neighborhood Services, and Economic Development.

The Climate Action Planning Team would collaborate with various City departments to ensure ongoing implementation of reduction strategies with each department's purview and would be responsible for securing and allocating funding, monitoring the effectiveness of emission reduction programs, preparation of annual progress reports, and community outreach. The Climate Action Planning Team would be composed of members of the City's Green Oceanside Campaign. The Climate Action Planning Team would collaborate with Green Oceanside Campaign volunteers and leverage existing outreach opportunities, such as the community events and Green Oceanside mobile phone application.

Measure Financing

Implementation of the local reduction measures may require cash output for the capital improvements and other investments, as well as result in increased operations and maintenance costs. This section presents a summary of funding and financing options (see **Table 14**, below).

The City intends to avail itself of technical support and other resources provided through SANDAG's Regional Climate Action Planning Framework (ReCAP). With the goal of establishing consistent methodologies and data sources for local climate action efforts, ReCAP offers best practices for developing, implementing, monitoring, and updating the technical components of local CAPs. The City has already engaged ReCAP to provide a benefit-cost assessment of emissions reduction measures as well as a CAP implementation cost analysis. It is anticipated that future GHG emissions inventories for the City will be prepared with ReCAP support, and that ReCAP will provide guidance and resources for CAP implementation and monitoring.

The City will also likely seek support from the Center for Sustainability Energy and SDG&E in implementing and monitoring certain emissions reduction measures. For instance, the City intends to work with the Center for Sustainability Energy to develop a means of monitoring compliance with the energy and water use disclosure and benchmarking requirements established in the CAP. The City will also try to leverage grants and technical assistance from SDG&E to promote energy efficiency programs, electric vehicle charging infrastructure, and renewable energy programs.

Table 14 Municipal Funding Sources

Municipal Funding Source	Description
General Funding Sources	
General Obligation Bond	■ A general obligation bond is a form of long-term borrowing and could be utilized to fund municipal improvements. General obligation bonds may be levied to fund nearly any municipal action.
General Fund	■ The General Fund is the City's primary discretionary budget, used to fund most City programs including public safety. The extent that programs and projects are of high priority and do not meet the criteria for other, more restrictive funding sources, the City Council allocated General Funds through the annual budget process. Sources for the General Fund include property taxes, transient occupancy taxes, and local sales taxes.
Enterprise Funds	■ Enterprise funds are funds raised by a government entity by selling goods and services to the public. City enterprise funds include utility fees for water supply, wastewater treatment, and solid waste collection.
Development Impact Fees	■ Pursuant to the California Subdivision Map Act, the City may impose fees on individuals that subdivide land for the purpose of development. These fees, commonly referred to as "development impact fees," may be used to fund public facility improvements such as construction of parks, recreational facilities, fire stations, or libraries. The City currently levies $4,431 parks fee and a $2,621 public facility fee per residential dwelling unit, $902 public facilities fee per thousand square feet of non-residential building space, $362 thoroughfare fee per vehicle trip, and several other school, traffic signal, water, wastewater, water utilities, drainage, and inclusionary housing in lieu fees.
Mello-Roos Taxes	■ Pursuant to the Community Facilities Act of 1982, the City of Oceanside may propose a Community Facilities District (CFD) measure. With two-thirds voter approval, the measure would establish a CFD tax on all properties within a specified boundary. CFD taxes are collected with property taxes and may be used to fund eligible projects.
Municipal Grant Opportunities	
San Diego Association of Governments (SANDAG)	■ For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources from SANDAG may be utilized: • Smart Growth Incentive Program • Active Transportation Grant Program ■ Employment Access and Reverse Commute and New Freedom Programs ■ The Regional Energy and Climate Change Program provides guidance and resources jurisdictions.
California Air Resources Board (California ARB)	■ Clean Vehicle Rebate Project provides incentives for public fleets located in or serving disadvantage communities. Rebates offered to public fleets located in or serving disadvantaged communities are up to $15,000 for fuel cell vehicles, $10,000 for battery electric vehicles, and $5250 for plug-in hybrid electric vehicles. ■ The Water-Energy Grant Program allocates funds for projects that reduced water and energy use. Specific focuses of the program include commercial or institutional water efficiency programs and residential water efficiency programs that benefit disadvantage communities.
California Dept. of Forestry and Fire Protection (CAL FIRE)	■ California Department of Forestry and Fire Protection Urban and Community Forestry Program works to optimize the benefits of trees and related vegetation through multiple-objective projects. ■ Projects must include a tree-planting component, preferably near an urban area or urban cluster.

Table 14 Municipal Funding Sources

Municipal Funding Source	Description
California Dept. of Resources Recycling and Recovery (CalRecycle)	■ The GHG Reduction Loan Program provides funds to support new or expanded organics infrastructure such as composing and anaerobic digestion facilities. Loans are subject to 4.0 percent interest. ■ CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams such as food waste, organics, recycled fiber, bottles and cans, used oil, plastic, and glass. ■ Incorporated cities and counties in California are eligible for funds.
California Dept. of Transportation (Caltrans)	■ The Active Transportation Program provides grant funding for projects that encourage active modes of transportation such as walking and bicycling.
California Natural Resources Agency (CNRA)	■ The Urban Greening Program will fund projects that acquire, create, or enhance community parks and green spaces. At least 25 percent of available funds are allocated to benefit disadvantaged communities and 10 percent are allocated to projects within disadvantage communities.
California Strategic Growth Council (SGC)	■ The SALC Program allocates grant funds for preservation of agricultural lands at-risk of conversion to other uses such as residential. ■ The Affordable Housing and Sustainable Communities Program provides grant funding for affordable housing loans for compact transit-oriented development and related infrastructure programs. Examples of projects eligible for funding include construction, rehabilitation, or acquisition of affordable housing, walkway improvements, bikeway improvements, non-capacity increasing streetscape improvements, street crossing improvements, traffic calming, street furniture, bicycle parking, transit service expansion, transit subsidy programs, etc.

Some funding sources are not necessarily provided directly to a City, but may be given to individuals, businesses, institutions, or larger regional agencies such as SANDAG. In addition to funding sources available to the City, the City should also understand how to promote funding sources available to local residents, businesses, and institutions. Promoting the benefits of sustainable practices and providing resources on how financing can be secured is one of the most important roles a local government can play in helping the community to implement many of the reduction measures. **Table 15** identifies funding sources available to local residents, businesses, and institutions.

Table 15 Non-Municipal Funding Sources

Other Funding Source	Eligible Candidate	Description
California Air Resources Board (California ARB)	Local Fleets	■ Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project provides vouchers to help California fleets purchase advanced technology trucks and hybrids
California Community Services and Development	Low-income Households	■ The LIWP provides financial assistance for energy efficiency and weatherization improvements. Projects include sealing cracks and holes, increasing insulation, replacing windows, water heater blankets, and air conditioning tune-ups. Low-income homeowners and renters are qualified applicants; funds are distributed based on need and typically prioritize elderly, disabled, or households with young children.
California Department of Food and Agriculture	Agricultural Operations	■ The Healthy Soils Incentives Program allocates grant funds for projects that build soil carbon and reduce agricultural GHG emissions.

Table 15 Non-Municipal Funding Sources

Other Funding Source	Eligible Candidate	Description
California Department of Transportation (Caltrans)	NTCD	■ The Low Carbon Transit Operations Program provides operating and capital assistance for transit agencies that serve disadvantaged communities. Grants may fund new or expanded transit routes, intermodal transit facilities, and facility and equipment maintenance.
	SANDAG	■ The Active Transportation Program provides grant funding for projects that encourage active modes of transportation such as walking and bicycling. Forty percent of the overall budget is reserved for MPO projects such as those administered by SANDAG.
Energy Upgrade California	Residents or Businesses	Energy Upgrade California is a statewide collaboration between the California Public Utilities Commission, California Energy Commission, and utility providers. The program provides up to $4,000 in rebates to offset the cost of energy efficiency improvements. Energy Upgrade California is funded by the American Recovery and Reinvestment Act, California utility ratepayers, and private contributions.
Federal Housing Administration (FHA)	Residents	The U.S. Department of Housing and Development piloted Energy Efficient Mortgages (EEM) in 1992 and expanded the program to be national in 1995. ■ EEMs typically are used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home. ■ An EEM is a mortgage that credits a home's energy efficiency in the mortgage itself. ■ To verify a home's energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved.
Federal Tax Credits for Energy Efficiency	Residents	■ Tax credits for many energy efficiency upgrades concluded in 2016. ■ Ongoing federal tax credits are available for solar energy systems (solar water heaters or solar photovoltaic panels) at 30 percent rebate through 2019, 26 percent rebate for 2020, and 22 percent rebate for 2021. Upgrades may be promoted to residents.
Green Oceanside Business Network	Businesses	■ The Green Oceanside Business Network is a free program that seeks to spur innovation and environmental responsibility. Member benefits include marketing incentives such as public recognition through the Green Oceanside mobile app and website and recognition at certain city-sponsored events. Additionally the program offers technical assistance and network support to members.
Property-Assessed Clean Energy (PACE)	Residents or Businesses	PACE Programs provide financing for energy and water efficiency improvements through property-secured loans that are repaid through property tax assessments and may transfer with sale of the property. PACE Programs generally offer long-term, low-interest loans and alleviate many concerns that a homeowner may move before the return on investment period of energy efficiency upgrades. The City of Oceanside passed a resolution to permit PACE programs in June 2013. ■ SANDAG has implemented the HERO (a PACE program) in the County to assist residents in financing residential energy efficiency and solar retrofits. HERO launched in Oceanside in February 2014. By August 2016, the HERO Program had provided $17 million of financing for energy and water efficiency upgrades in Oceanside. ■ Ygrene is a privately funded PACE Program. By July 2016, the Ygrene Program had provided nearly $3.7 million in financing for energy and water efficiency upgrades in Oceanside.

Table 15 Non-Municipal Funding Sources

Other Funding Source	Eligible Candidate	Description
San Diego Gas & Electric (SDG&E	Residents, Businesses, or Institutions	SDG&E oversees several local components of Energy Upgrade California and Go Solar California. SDG&E's identifies and distributes rebates for a wide variety of energy efficiency upgrades and also provides educational resources. Specific rebate programs administered under the umbrella of the Go Solar California initiative include: ■ The CSI General Market Program funds solar photovoltaics and other solar thermal generating technologies for residential, commercial, agricultural, governmental, and non-profit buildings. ■ The CSI Thermal Program funds solar hot water systems for homes and businesses. ■ The SASH Program funds solar photovoltaic systems for low-income households. ■ The Multi-family Affordable Solar Homes Program funds solar photovoltaic systems for low-income households. ■ The CSI Research, Development, Demonstration and Deployment Program provides grants for demonstrative projects.

Implementation Timeline and Prioritization

The success of the CAP depends upon the timely implementation of reduction measures and the active participation of the Oceanside community at-large. Few reduction measures involve a singular, unilateral implementation by a City employee or department; many reduction measures include distinct outreach, feedback, planning, and implementation actions. Determining which reduction measures are difficult to achieve and require substantial investment of time or money and which reduction measures are "low-hanging fruit," are important considerations for climate action planning. Prioritization of reduction measures is generally based on the following factors:

- Level of City Authority/Control
- Required Time for Implementation
- Funding Availability
- GHG Reduction Efficiency
- Implementation Cost/Cost Efficiency
- Required Staff Effort
- Stakeholder Input
- Measure Co-Benefits
- Other Implementation/Feasibility Constraints

In consideration of these factors, the following is an outline of key priorities and phases of implementation.

- Commencement Phase – Concurrent with CAP adoption (2019):
  Appoint Climate Action Planning Team members and incorporate CAP goals into the Green Oceanside Campaign.
- Phase 1 – Within two years of CAP adoption (2019–2020):
  Develop key ordinances; implement the measures that the City has independent control over; establish outreach programs through the Green Oceanside Campaign, and prepare supporting research for Phase 2 measures.
- Phase 2 – Within five years of CAP adoption (2019–2023):
  Implement remaining measures that were contingent on outreach efforts, supporting research, or other planning efforts.
- Phase 3 – Beyond five years of CAP adoption (2024–2030):
  Continue to implement Phase 1 and Phase 2 measures; implement long-term measures.

The reduction measures were evaluated qualitatively to assess the level of effort required for implementation. The level of effort associated with each GHG reduction measure have been categorized based on the convention of low, moderate, or high accounting for the amount of staff time and the financial burden on the City. Criteria are shown in **Table 16**, below.

Table 16 Measure Implementation Criteria

Level of Effort	Implementation Difficulty
Low	The measure could be implemented by existing staff and/or programs and that upfront costs are minimal or would be nearly offset by available funding sources.
Moderate	The measure would burden existing staff and/or programs to the point that additional staff may be required. Additionally, the measure would involve direct short-term costs that are unlikely to be offset by available funding sources.
High	The measure would burden existing staff and/or programs to the point that additional staff may be required. Additionally, the measure would involve direct long-term recurring costs that are unlikely to be offset by available funding sources.

Individual assessment of each the level of effort associated with each measure is summarized in **Table 17**, below. For reference, Table 3 also includes the GHG emission reduction that would be achieved by each measure.

Table 17 Level of Effort of Reduction Measures

Measure Strategies	Level of Effort	Reduction Potential
E1—Renewable Energy Procurement Promote Participation in SDG&E EcoChoice and Ecoshare Programs Annual Reporting on SDG&E Procurement and Program Participation Conduct Community Choice Energy Program Feasibility Study	High	High 73,685 MT CO_2e by 2030
E2—Solar Photovoltaic Promotion Program Adopt Solar Ordinance for New Development Promote Solar Financing Options Maintain Expedited Permitting for Residential Solar PV Systems Establish an Aggregated Demand Solar PV Program	Low	High 19,448 MT CO_2e by 2030
E3—Residential Energy Conservation and Disclosure Promote Residential Energy Use Disclosure Promote Energy Efficiency Improvement Financing Options	Moderate	Moderate Not Quantified
E4—Promotion of Low-Income Financing Programs Promote Low-Income Financing Options	Moderate	Moderate Not Quantified
E5—Non-Residential Building Energy Benchmarking and Disclosure Promote Non-Residential Energy Use Disclosure	Moderate	Moderate Not Quantified
W1—Implementation of the Water Conservation Master Plan Implement Water Conservation Master Plan	Moderate	Moderate 1,610 MT CO_2e by 2040
W2—Non-Residential Water Use Benchmarking and Disclosure Promote Non-Residential Water Use Disclosure	Moderate	Moderate Not Quantified
W3— Increased Local Water Supply Implement Capital Improvements to Increase the Supply Capacity of Recycled Water	High	Moderate 5,608 MT CO_2e by 2045
SW1—Implementation of Zero Waste Strategic Resource Plan Implement the Zero Waste Strategic Resource Management Plan	High	High 10,331 MT CO_2e by 2020
SW2— Beyond 2020 - Enhanced Waste Diversion Beyond 2020 - Enhanced Waste Diversion	High	High 16,524 MT CO_2e by 2035
TL1— Smart Growth Policies Adopt Smart Growth Policy Annual Reporting on Development Patterns Incent Development in SGOA	High	Moderate[12] 2,486 MT CO_2e by 2030
TL2—Electric Vehicle Promotion Adopt Electric Vehicle Infrastructure Ordinance to Require EV stations Promote Incentives for EVs and EV Charging Stations Establish an Aggregated Demand EV Program	Moderate	Moderate 4,923 MT CO_2e by 2030
TL3—Preferential Parking Spaces for Clean Air Vehicles Adopt Clean Air Vehicle Parking Ordinance	Low	Low Not Quantified

[12] Smart Growth Policies would achieve be anticipated to achieve greater long-term reductions than reflected by the reported reduction potential. Increased density in development clusters such as SGOAs facilitates implementation of subsequent GHG reduction measures such as enhanced transit, reduced parking requirements, etc.

Table 17 Level of Effort of Reduction Measures

Measure Strategies	Level of Effort	Reduction Potential
TL4—Expand Complete Streets Programs Incorporate Criteria for Multiuse Pathways Opportunity Sites in the Bicycle/Pedestrian Master Plan Update. Adopt Complete Streets Policy to Facilitate Incorporation of Complete Streets Concepts Periodically Update the Citywide Traffic Signal Priority List Develop a Neighborhood Electric Vehicle Implementation Plan Promote Walking, Bicycling, or Carpooling to School	Low	Low Not Quantified
TL5—Transportation Demand Management Plans Adopt a TDM Ordinance to require TDM Plans for New Developments Conduct Surveys to Determine Existing TDM Measure Implementation Provide Incentives for Implementation of TDM Measures at Existing Businesses	Moderate	Moderate 4,161 MT CO_2e by 2050
AF1—Urban Forestry Program Inventory Existing Tree Canopy Adopt a Green Streets Ordinance to Require Shade Trees in New Developments Adopt a Green Streets Policy to Require Shade Trees in CIP Roadway Projects Promote Tree Canopy Expansion in Public Right-of-Way Support Volunteer Tree Planting and Stewardship Efforts Allow CEQA Impact Mitigation through Tree Planting and Stewardship	Low	Low 806 MT CO_2e
AF2—Urban Agriculture and Community Gardens Adopt an Urban Agriculture and Community Gardens Policy to Establish Goals and Measures Implement an Urban Agriculture and Community Gardens Program Adopt an Urban Agriculture Incentive Zone Ordinance Promote Urban Agriculture and Community Gardening	Low	Low Not Quantified
AF3—South Morro Hills Agricultural Lands Conservation Program Develop an Agricultural Lands Conservation Program	Moderate	High 12,990 MT CO_2e
AF4—Carbon Farming Program Implement a Demonstrative Carbon Farming Program	High	Low Not Quantified

The implementation actions associated with each GHG reduction measure as well as the responsible department are shown in **Table 18**, below. The prioritization of reduction measures including phasing and recommended schedule milestones is also included. As discussed previously, the prioritization of reduction measures is based on which measures are anticipated to be “low hanging fruit”; the City may revise schedule milestones based the level of effort experienced during implementation.

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
E1—Renewable Energy Procurement			
Promote Participation in SDG&E EcoChoice and Ecoshare Programs	Lead Department: Water Utilities Department Ordinance Approved by: City Council	Phase 1	Plan Outreach Effort Within 1 year of CAP Adoption
			Identify Outreach Plan in Initial Annual Progress Report Completed (Y/N)
Annual Reporting on SDG&E Procurement and Program Participation		Phase 1 Phase 2 Phase 3	Report CPUC Forecasted RPS Procurement for SDG&E Annually Completed (Y/N)
			Report Program Participated and Report Minimum Diversion Rates Annually Completed (Y/N)
			Renewable Energy Procurement Goals *for Aggregate Demand of Local Accounts* *50 Percent by 2025* *75 Percent by 2030*
Conduct Community Choice Energy (CCE) Program Feasibility Study		Phase 3	Conduct Feasibility Study Within One Year of Forecasted Shortfall of Renewable Energy Procurement Goals Above Completed (Y/N)
			Recommend Creation of Municipal CCE Program or Joint Powers Authority CCE Program As needed Completed (Y/N/NA)
E2—Solar Photovoltaic Promotion Program			
Adopt Solar Ordinance for New Development	Lead Department: Development Services Department Ordinance Approved by: City Council	Phase 1	Ordinance Drafted Within 3 months of CAP Adoption
			Schedule Hearing Date Within 6 months of CAP Adoption
			Ordinance Adoption Within 6 months of CAP Adoption
			Target Requirement for New Development *50% Forecasted Energy Demand*
Promote Solar Financing Options	Lead Department: Economic Development Department Collaborating with: Water Utilities Department & Development Services Department	Phase 1 Phase 2 Phase 3	Publish Information to Website Within 1 year of CAP Adoption
			Coordinate with SANDAG Within 1 year of CAP Adoption
			Plan Outreach Effort Within 1 year of CAP Adoption
			Target Households Notified *To be Established*
Maintain Expedited Permitting for Residential Solar PV Systems	Lead Department: Development Services Department	Phase 1 Phase 2 Phase 3	*Target Average Residential PV Permitting* *Less than 5 days*
			Target Average Commercial PV Permitting *Less than 12 days*

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
Establish an Aggregated Demand Solar PV Program	Lead Department: Economic Development Department Collaborating with: Water Utilities Department & Development Services Department	Phase 1 Phase 2 Phase 3	Review California Solar Initiative Data to Identify Average Installation Costs for Various Solar PV System Sizes Within 6 months of CAP Adoption
			Compile List of Solar System Vendors Operating in Oceanside Within 6 months of CAP Adoption
			Solicit Interest from Vendors and Negotiate A Reduced "Bulk Pricing" for Installation Various Solar PV System Sizes Within 1 year of CAP Adoption
			Publish Information to Website Within 18 months of CAP Adoption
			Assess and Report Program Participation Annually Completed (Y/N)
E3—Residential Energy Conservation and Disclosure			
Promote Residential Energy Use Disclosure	Lead Department: Water Utilities Department	Phase 1	Plan Outreach Effort Within 1 year of CAP Adoption
			Identify Outreach Plan in Initial Annual Progress Report Completed (Y/N)
Promote Energy Efficiency Improvement Financing Options	Lead Department: Development Services Department Collaborating with: Water Utilities Department	Phase 1 Phase 2 Phase 3	Publish Information to Website Within 1 year of CAP Adoption
			Coordinate with SANDAG Within 1 year of CAP Adoption
			Plan Outreach Effort Within 1 year of CAP Adoption
			Target Households Notified *To be Established*
E4—Promotion of Low-Income Financing Programs			
Promote Low-Income Financing Options	Lead Department: Development Services Collaborating with: Water Utilities Department	Phase 1 Phase 2 Phase 3	Publish Information to Website Within 1 year of CAP Adoption
			Identify Low-Income Households Within 18 months of CAP Adoption
			Plan Outreach Effort Within 18 months of CAP Adoption
			Target Households Notified *To be Established*

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
E5—Non-Residential Building Energy Benchmarking and Disclosure			
Promote Non-Residential Energy Use Disclosure	Lead Department: Water Utilities Department	Phase 1	Plan Outreach Effort Within 1 year of CAP Adoption
			Identify Outreach Plan in Initial Annual Progress Report Completed (Y/N)
W1—Implementation of the Water Conservation Master Plan			
Implement Water Conservation Master Plan	Lead Department: Water Utilities Department	Phase 1 Phase 2 Phase 3	Continue Offering Rebates on Water Efficient Fixtures Continued (Y/N)
			Continue Requiring Automated Landscape Watering Continued (Y/N)
			Continue Outreach Efforts through Green Oceanside Continued (Y/N)
W2—Non-Residential Water Use Benchmarking and Disclosure			
Promote Non-Residential Water Use Disclosure	Lead Department: Water Utilities Department	Phase 1	Plan Outreach Effort Within 1 year of CAP Adoption
			Identify Outreach Plan in Initial Annual Progress Report Completed (Y/N)
W3— Increased Local Water Supply			
Implement Capital Improvements to Increase the Supply Capacity of Recycled Water	Lead Department: Water Utilities Department	Phase 1 Phase 2 Phase 3	Implement Phase I Recommendations from the Recycled Water Facility Plan Within 5 years of CAP Adoption
			Implement Phase II Recommendations from the Recycled Water Facility Plan Within 7 years of CAP Adoption
		Phase 3	Update the Recycled Water Facility Plan Within 10 years of CAP Adoption
			Target Recycled Water Supply *5.5 MGD by 2035* *7.5 MGD by 2045*
SW1—Implementation of Zero Waste Strategic Resource Plan			
Implement the Zero Waste Strategic Resource Management Plan	Lead Department: Water Utilities Department	Phase 1 Phase 2	Implement Phase 2 Recommendations Support Resource Recovery Parks Take-back Diaper Policy Extended Producer Responsibilities Disposable Product Bans Construction Waste Recycling Food Recovery and Waste Recycling Increased Composting
			Waste Diversion Rate 75% by 2020

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
SW2— Beyond 2020 - Enhanced Waste Diversion			
Beyond 2020 - Enhanced Waste Diversion	Lead Department: Water Utilities Department	Phase 2 Phase 3	Continue Outreach Efforts through Green Oceanside Continued (Y/N)
			Reduce edible food waste generation through the implementation of food donation programs and services. Completed (Y/N)
			Prepare and implement a plan to divert organic waste from landfills to local facilities capable of receiving and/or processing organics for beneficial reuse (e.g. for compost and renewable energy via biogas cogeneration facilities). These facilities include those with anaerobic digestion capacity such as the City's San Luis Rey Water Reclamation Facility. Completed (Y/N)
			Divert waste locally to minimize transportation emissions. Completed (Y/N)
			Co-locate local waste facilities with compatible end products to minimize transportation emissions Completed (Y/N)
			In 2020, the City will reevaluate the effectiveness of the Zero Waste Resource Management Plan's programs as well as the City's solid waste diversion rate. Through this effort, the City may establish new baseline diversion rates for consideration such as 80% by 2025, 85% by 2030, and 90% by 2035.
TL1— Smart Growth Policies			
Adopt Smart Growth Policy to Focus New Development in SGOAs	Lead Department: Development Services Department Ordinance Approved by: City Council Enforcement Established Through Annual Reporting to: City Council	Phase 1 Phase 2 Phase 3	SGOA Delineation by Parcel Number Within 1 year of CAP Adoption
			Policy Adoption Within 18 months of CAP Adoption
			Publish SGOA Delineation on website Within 18 months of CAP Adoption

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
Annual Reporting on Development Patterns and Recommendations	Lead Department(s): Development Services Department & Neighborhood Services, Code Enforcement	Phase 1 Phase 2 Phase 3	Quantify Annual and Cumulative Development Since CAP Adoption Completed (Y/N)
			Quantify Proposed Development Completed (Y/N)
			Estimate Future Development Completed (Y/N)
			Target Residential Development in SGOA *50 Percent of New Dwelling Units -* *300 new dwelling units by 2020* *550 new dwelling units by 2024* *890 new dwelling units by 2027* *1,150 new dwelling units by 2030*
			Target Commercial Development in SGOA *50 Percent of New Employment -* *1,160 new jobs by 2020* *3,030 new jobs by 2024* *5,770 new jobs by 2027* *8,030 new jobs by 2030*
			Assess Consistency with Smart Growth Policy Completed (Y/N)
Incent Development in SGOA	Lead Department(s): Development Services Department & Public Works Department Collaborating with: Water Utilities Department Approved by: City Council	Phase 1 Phase 2 Phase 3	Recommend Smart Growth Incentives As needed Completed (Y/N/NA)
			Implement Smart Growth Streamlined Permitting As needed Completed (Y/N/NA)
			Implement Public Infrastructure Improvements As needed Completed (Y/N/NA)
			Implement Zoning Amendments As needed Completed (Y/N/NA)
			Implement Relaxed Development Fees and Requirements As a Master Plan As needed Completed (Y/N/NA)
			Implement Smart Growth Development Credit Exchange Program As needed Completed (Y/N/NA)

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
TL2—Electric Vehicle Promotion			
Adopt EV Infrastructure Ordinance to Require EV stations	Lead Department(s): Development Services Department Ordinance Approved by: City Council Enforced by: Neighborhood Services, Code Enforcement	Phase 1	Ordinance Drafted Within 3 months of CAP Adoption
			Ordinance Adoption Within 6 months of CAP Adoption
			Target Pre-wiring for EV Charging Stations *All Residential Garages* *5% Residential Surface Parking* *10% Non-Residential Parking Spaces*
			Target EV Charging Station Requirement *50% of Pre-wired Spaces*
Promote Incentives for EVs and EV Charging Stations	Lead Department(s): Development Services Department & Economic Development Department Collaborating with: Water Utilities Department Zoning Amendment Approved by: City Council	Phase 1 Phase 2 Phase 3	Publish Information to Website Within 1 year of CAP Adoption
			Provide Permit Fee Waivers for EV Charging Station Installation Within 1 year of CAP Adoption
			Amend Zoning Code for By-Right Sale of EV in Commercial Zones Within 1 year of CAP Adoption
			Establish Incentives for EV Charging at Gas Stations Within 2 year of CAP Adoption
			Establish Incentives for EV Charging at Employment Centers Within 2 year of CAP Adoption
			Target Rebate Incentives Offered by City: *$3,000 Level 2 Charging Station* *$10,000 per DC Fast Charger* *Rebate Capped at 50% of Cost* *(limited rebates per property)*
Establish an Aggregated Demand EV Program	Lead Department: Economic Development Department Collaborating with: Water Utilities Department & Development Services Department	Phase 1 Phase 2 Phase 3	Compile List of Various EV Models and Identify Average Prices Within 1 year of CAP Adoption
			Solicit Interest from Vendors and Negotiate A Reduced "Bulk Pricing" for Various EV Within 18 months of CAP Adoption
			Publish Information to Website Within 2 years of CAP Adoption
			Assess and Report Program Participation Annually Completed (Y/N)

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
TL3—Preferential Parking Spaces for Clean Air Vehicles			
Adopt Clean Air Vehicle Parking Ordinance	Lead Department: Development Services Department Ordinance Approved by: City Council Enforced by: Neighborhood Services, Code Enforcement	Phase 1	Ordinance Drafted Within 3 months of CAP Adoption
			Ordinance Adoption Within 6 months of CAP Adoption
			Target Parking Requirement *12% of Commercial and Industrial Parking Spaces*
TL4—Expand Complete Streets Programs			
Incorporate Criteria for Multiuse Pathways Opportunity Sites in the Bicycle/Pedestrian Master Plan Update.	Lead Department: Public Works Department	Phase 2	Pedestrian/Bicycle Master Plan Update Adoption Within 5 years of CAP Adoption
Adopt Complete Streets Policy to Facilitate Incorporation of Complete Streets Concepts	Lead Department(s): Development Services Department & Public Works Enforcement Established Through Annual Reporting to: City Council	Phase 1	Require New Developments Provide Connections to/Extensions of Existing Bicycle and Pedestrian Networks Within 6 months of CAP Adoption
			Establish a complete streets criteria checklist for Capital Improvement Projects Within 1 year of CAP Adoption
			Establish criteria for identifying opportunities to convert intersections to roundabouts Within 1 year of CAP Adoption
			Require CIP roadway construction and maintenance projects be reviewed for potential opportunities to incorporate complete street improvements Within 1 year of CAP Adoption
		Phase 1 Phase 2 Phase 3	*Target Single Passenger Vehicle Commute* *Maintained at less than 80%*[13]
Periodically Update the Citywide Traffic Signal Priority List	Lead Department: Public Works Department	Phase 1 Phase 2 Phase 3	Continue Periodically Update the City Traffic Signal Priority List Continued (Y/N)
Develop a Neighborhood Electric Vehicle Implementation Plan	Lead Department: Public Works Department	Phase 1	Identify and Contact Interested Parties Within 3 months of CAP Adoption
			Establish Plan Goals, Identify Costs, and Solicit Community Feedback Within 1 year of CAP Adoption
Promote Walking, Bicycling, or Carpooling to School	Lead Department: Water Utilities Department	Phase 1 Phase 2 Phase 3	Plan Outreach Effort Within 1 year of CAP Adoption

[13] Data obtained from U.S. Census Data Finder Web Tool indicates that the mode share of drive-alone cars, trucks, or vans in Oceanside has steadily increased from approximately 75 percent in 2009 to 79 percent in 2015.

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
TL5—Transportation Demand Management Plans			
Adopt a TDM Ordinance to require TDM Plans for New Developments	Lead Department: Development Services Department Collaborating with: Economic Development Department Ordinance Approved by: City Council	Phase 1	Ordinance Drafted Within 6 months of CAP Adoption
			Ordinance Adoption Within 1 year of CAP Adoption
			Target TDM Requirement Applicability *Commercial of Industrial Developments that generate 100 vehicle commute trips per day*
Conduct Surveys to Determine Existing TDM Measure Implementation	Lead Department: Economic Development Department	Phase 1	Develop Survey Questionnaire Within 1 year of CAP Adoption
		Phase 1 Phase 2	*Target Surveyed Businesses* *25% within 1 years* *50% within 2 years* *75% within 3 years* *100% within 4 years*
Provide Incentives for Implementation of TDM Measures at Existing Businesses	Lead Department: Economic Development Department Collaborating with: Water Utilities Department	Phase 2	Use Survey Results to Identify TDM Opportunities Within 18 months of CAP Adoption
			Provide Incentives as Appropriate for Infrastructure Improvements to Support Alternative Modes of Transit Within 2 years of CAP Adoption
			Target Financing Alternatives *To be Established*
			Target Rebate Incentives *To be Established*
AF1—Urban Forestry Program			
Inventory Existing Tree Canopy	Lead Department(s): Public Works & Neighborhood Services, Parks and Recreation	Phase 1	Quantify Number and Species of Existing Trees Within 1 year of CAP Adoption
			Identify Trees That Provide Co-benefits Such as Building Neighborhood Character Within 1 year of CAP Adoption
Adopt a Green Streets Ordinance to Require Shade Trees in New Developments	Lead Department(s): Public Works & Development Services Department Ordinance Approved by: City Council	Phase 1 Phase 2 Phase 3	Ordinance/Policy Drafted Within 3 months of CAP Adoption
			Ordinance/Policy Adoption Within 6 months of CAP Adoption
			Target Requirements for New Developments *35% tree canopy cover*
			Provide Streamlined Development Review for Projects that Substantially Exceed Requirements Within 2 year of CAP Adoption

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
Adopt a Green Streets Policy to Require Shade Trees be Incorporated in CIP Roadway Projects.	Lead Department(s): Public Works & Development Services Department Ordinance Approved by: City Council	Phase 1 Phase 2 Phase 3	Ordinance/Policy Drafted Within 3 months of CAP Adoption
			Ordinance/Policy Adoption Within 6 months of CAP Adoption
			Establish a Green Streets Checklist for CIP Projects Within 1 year of CAP Adoption
Promote Tree Canopy Expansion in Public Right-of-Way	Lead Department: Water Utilities Department Collaborating with: Public Works & Neighborhood Services, Parks and Recreation	Phase 1 Phase 2 Phase 3	Plan Outreach Effort Within 1 year of CAP Adoption
Support Volunteer Tree Planting and Stewardship Efforts			Identify Outreach Plan in Initial Annual Progress Report Completed (Y/N)
Allow CEQA Impact Mitigation through Tree Planting and Stewardship	Lead Department: Development Services Department	Phase 1 Phase 2 Phase 3	Continue Environmental Review Completed (Y/N)
AF2—Urban Agriculture and Community Gardens			
Adopt an Urban Agriculture and Community Gardens Policy to Establish Goals and Measures	Lead Department: Neighborhood Services Department	Phase 1	Policy Drafted Within 1 year of CAP Adoption
			Policy Adoption Within 18 months of CAP Adoption
			Policy Establishes a Population Ratio Goal and Service Distance Criterion *Completed (Y/N)*
Implement an Urban Agriculture and Community Gardens Program	Lead Department: Neighborhood Services Department	Phase 1 Phase 2	Identify Potentially Feasible Site Locations for Urban Agriculture and Community Gardens Within 2 years of CAP Adoption
			Identify Service Areas with No Feasible Site Locations for Urban Agriculture or Community Gardens Within 2 years of CAP Adoption
			Amend zoning regulations to allow for urban agriculture and community gardens in appropriate zones. Within 2 years of CAP Adoption
			Construct Community Gardens to Meet Urban Agriculture and Community Gardens Policy Goals Within 5 years of CAP Adoption
			Collaborate with Parties to Identify Appropriate Design, Maintenance, and Operations of Community Gardens Within 5 years of CAP Adoption
		Phase 1 Phase 2 Phase 3	Collaborate with Parties to designate community garden coordinators Within 5 years of CAP Adoption

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
Adopt an Urban Agriculture Incentive Zone Ordinance	Lead Department(s): Economic Development Department Ordinance Approved by: City Council	Phase 1	Ordinance/Policy Drafted Within 3 months of CAP Adoption
			Ordinance/Policy Adoption Within 6 months of CAP Adoption
Promote Urban Agriculture and Community Gardening	Lead Department: Water Utilities Department	Phase 2 Phase 3	Plan Outreach Effort Within 1 year of Urban Agriculture and Community Gardens Program
AF3—South Morro Hills Agricultural Lands Conservation Program			
Develop an Agricultural Lands Conservation Program	Lead Department: Development Services Department Collaborating with: Water Utilities	Commencement Phase	Designate a Climate Action Planning Team Member to Become Knowledgeable on SALC Grant Guidelines Completed (Y/N)
		Phase 1 Phase 2 Phase 3	Identify Funding Sources for 2020-2024 Before July 2020
			Perform Outreach to Identify Interested Parties Before January 2020
			Identify Funding Sources for 2025-2029 Before July 2024
			Prepare Annual Report Quantifying Program Participation and Funds, and identify At-Risk Agricultural Lands Completed (Y/N)
			Target Lands Places Under Ag Conservation Easements *50 acres per year -* *100 acres by 2022* *200 acres by 2024* *300 acres by 2024* *400 acres by 2028* *500 acres by 2030*

Table 18 Implementation Actions

Actions	Responsible Department	Phase	Schedule Milestones/ Performance Targets
AF4—Carbon Farming Program			
Implement a Demonstrative Carbon Farming Program	Lead Department: Water Utilities Collaborating with: Development Services Department	Commencement Phase	Designate a Climate Action Planning Team Member to Become Knowledgeable on Sustainable Practices Completed (Y/N)
		Phase 1 Phase 2	Policy Drafted Within 2 year of CAP Adoption
			Policy Quantifies Program Goals Tied to Concrete Metrics (i.e. technologies, acres, water reduction) *Requirements (Y/N)*
			Identified Funding Sources for Program Within 30 months of CAP Adoption
			Identify Interested Parties Within 30 months of CAP Adoption
			Policy Adoption and Implementation Within 3 year of CAP Adoption
		Phase 1 Phase 2 Phase 3	Prepare Annual Report to Quantifying Program Participation and Findings Completed (Y/N)

Development Project Review Checklist

For proposed land use development projects, proponents shall complete the CAP Project Review Checklist. The Project Review Checklist is designed to assess consistency with GHG reduction measures identified in Chapter 3. The CAP and Project Review Checklist are intended as living documents. The City may amend the Project Review Checklist as adoption of policies and ordinances identified in **Table 19** establish more refined criteria.

Table 19 Project Review Checklist

Checklist Item	Inclusion
Project Information	
Applicant: ______	
Project Name: ______	
Project Number: ______	
Property Address: ______	
Project Area: ______ acres	
Proposed Uses:	
Single-family Residential ______ units	
Multi-family Residential ______ units	
Commercial ______ square feet	
Industrial ______ square feet	
Other ______ square feet	
Project Description: ______	
Smart Growth	
1. Is the project located within an existing or potential SANDAG smart growth opportunity area (SGOA)?	☐ Yes ☐ No ☐ N/A
If "Yes" proceed to Item 2 of the Checklist If "No" proceed to Item 3 of the Checklist	
2. Do the proposed land use densities meet or exceed SANDAG's minimum target densities? *Town Center SGOA Target Densities* *20 dwelling units per acre; or* *30 employees per acre; or* *Combination thereof* *Mixed-Use Transit Corridor SGOA Target Densities* *24 dwelling units per acre; or* *Any density commercial development;* *Community Center SGOA Target Densities* *20 dwelling units per acre; or* *Any density commercial development*	☐ Yes ☐ No ☐ N/A
If "Yes" the project is consistent with Smart Growth Land Use; Skip to Item 4 of the Checklist; If "No" proceed to Item 3 of the Checklist	
3. Does the project propose land use that is consistent with, or less GHG-intensive than, the existing General Plan Land Use Designation?	☐ Yes ☐ No ☐ N/A
If "Yes" the project is consistent with Smart Growth Land Use; If "No" proceed to Item 4 of the Checklist	
~~4. Does the project propose to purchase carbon offset credits that would result in lesser net GHG emissions than the existing General Plan Land Use Designation?~~	~~☐ Yes~~ ~~☐ No~~ ~~☐ N/A~~
~~If "Yes" the project is consistent with Smart Growth Land Use;~~ ~~If "No" the project is could conflict with Smart Growth Land Use~~ ~~*Mitigation through purchase of carbon offset credits shall only be considered with input from City staff including the Climate Action Planning Team. Carbon offset credits must represent voluntary local reduction measures that achieve long-lived reductions. As feasible, preference will be given to like-for-like offsets (for example, increased transportation emissions shall be offset by transportation reduction measures).*~~	

Table 19 Project Review Checklist

Alternative-Fueled Vehicle Infrastructure	
4~~5~~. For single-family residential projects, does the project include prewiring to allow for future electric vehicle charging stations in the garage or driveway of each residence? For multi-family residential projects, does the project include prewiring to allow for future electric vehicle charging stations in all garages and 5 percent of resident and visitor parking spaces (2 minimum)? For commercial or industrial projects, does the project include prewiring to allow for future electric vehicle charging stations in 10 percent of surface parking spaces (2 minimum) and include immediate installation of charging stations at half of these prewired parking spaces?	☐ Yes ☐ No ☐ N/A
Alternative-Fueled Vehicle Parking	
5~~6~~. For commercial or industrial projects, does the project include reserved parking for clean air vehicles at 12 percent of parking spaces?	☐ Yes ☐ No ☐ N/A
Transportation Demand Management	
6~~7~~. For commercial or industrial projects that would generate more than 100 vehicle commute trips per day, does the project include a minimum of10 points of transportation demand management strategies? *[Transportation demand management strategies will be expanded in TDM Ordinance*] Employee Rideshare Programs (4 points per project) Secure Bicycle End-trip Facilities (i.e. secure parking, lockers, and showers) (2 points per project) Improvements to Adjacent Bicycle Lane (2 points per project) Pedestrian/Bicycle Connections to Off-site Paths (1 point per project) Unbundled Parking Pricing/ Employee Parking Cash-Out Programs (2 points per $20 monthly cash-out) Discounted Transit Program (2 points per $0.75 of subsidy) Roadway Safety improvements (e.g. curb bulb-outs, raised pedestrian crossings, count-down signal timers, chicanes, raised medians, etc.) (1 point per feature/intersection) Improvements to Nearby Transit Stops (i.e. improved shelters, benches, and street lighting) (1 point per stop)	☐ Yes ☐ No ☐ N/A
Energy Efficiency	
7~~8~~. For projects that include more than 50 surface parking spaces - Does the project incorporate on-site renewable energy sources capable of offsetting at least 50 percent of forecasted electricity demand?	☐ Yes ☐ No ☐ N/A
Recycled Water	
8~~9~~. Does the project incorporate service connections for immediate or future recycled water use? *Recycled water may be feasible for landscape, agricultural, or natural system irrigation, recreational impoundment, industrial processes, or for toilet or urinals.*	☐ Yes ☐ No ☐ N/A
Tree Canopy	
9~~10~~. Does the project promote a walkable environment through incorporation of shade trees in parking lots, recreation areas, and along frontage?	☐ Yes ☐ No ☐ N/A

If "Yes" for all checklist items, then the project is considered consistent with the CAP.
If "No" for any checklist item, the project's GHG impact is significant. The project must incorporate each checklist item to the maximum extent feasible; however the project's GHG impact would remain significant.

Monitoring, Reporting, and Adaptive Management

Regular monitoring is important to ensure programs are functioning as they were originally intended. Early identification of effective strategies and potential issues will enable the City to make informed decisions on future priorities, funding, and scheduling. Moreover, monitoring provides concrete data to document the City's progress in reducing GHG emissions. The City will be responsible for developing a protocol for monitoring the effectiveness of emissions reduction programs as well as for undertaking emissions inventory updates:

- **Track Implementation of Reduction Measures**—The City will keep track of reduction measures implemented and schedule milestones identified in the CAP, including progress reports on the reduction measures, funding, and savings.
- **Track Progress Activity Indicators**—The City will keep track of easily quantified metrics including communitywide electricity demand, natural gas use, and water use. This will allow at least a rough attribution of quantified emissions reductions when combined with GHG reduction measure tracking.
- **Track State Progress**—Forecasted emissions rely heavily on State-level measures. The City will be responsible for tracking the State's progress on implementing State-level programs. Close monitoring of the real gains being achieved by State programs will allow the City to identify potential gaps or redundancies between state and local reduction measures, and to adjust its CAP, if needed.
- **Annual Progress Reports**—The City will report annually to the City Council on CAP implementation progress, activity indicators, and relevant changes in State measures. Presentations to the City Council will be published on the City webpage. If needed, the CAP will be adjusted, amended, or supplemented following annual reports.
- **Update GHG Inventory**—The City will comprehensively update its 2020 GHG inventory to evaluate progress toward meeting its GHG reduction goals. This includes data collection in each of the primary inventory sectors (electricity demand, natural gas use, regional vehicle miles traveled, solid waste disposal, water and wastewater, and municipal facilities), and comparing the inventory to the City's baseline GHG emissions. Information will be consolidated in a database or spreadsheet that can be used to evaluate the effectiveness of individual reduction measures. Moving beyond 2020, the City will comprehensively update its GHG inventory every five years.
- **CAP Updates**—The City is committed to preparing updates to the CAP every five years following each comprehensive GHG inventory update.

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City of Oceanside 2013 Community Greenhouse Gas Emissions Inventory and Forecast

City of Oceanside Greenhouse Gas Emissions Inventory and Forecast

January 2016

Prepared for the City of Oceanside

Prepared by the Energy Policy Initiatives Center

ENERGY POLICY INITIATIVES CENTER
UNIVERSITY OF SAN DIEGO SCHOOL OF LAW

About EPIC

The Energy Policy Initiatives Center (EPIC) is a nonprofit academic and research center of the USD School of Law that studies energy policy issues affecting the San Diego region and California. EPIC integrates research and analysis, law school study, and public education, and serves as a source of legal and policy expertise and information in the development of sustainable solutions that meet our future energy needs.

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1 INTRODUCTION

This report presents a summary of community-scale greenhouse gas (GHG) emissions for 2013 and business-as-usual (BAU) GHG emissions projection for 2020, 2030 and 2035 from the City of Oceanside.

1.1 Greenhouse Gases

The primary greenhouse gases (GHGs) included in this inventory are carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Each GHG has a different capability of trapping heat in the atmosphere, known as its global warming potential (GWP), which is normalized relative to CO_2 and expressed in carbon dioxide equivalents (CO_2e). In general, the 100-year GWPs reported by the Intergovernmental Panel on Climate Change (IPCC) are used to estimate greenhouse gas emissions. The GWPs used in this inventory are from IPCC Forth Assessment Report (AR4)[1], given in Table 1.

Table 1 Global Warming Potentials Used in the Oceanside Inventory

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

1.2 Sectors

The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions published by ICLEI USA (referred to as the ICLEI Community Protocol) recommends including emissions from six sectors for a typical community-scale GHG inventory.[2] These sectors are: electricity, natural gas, transportation, solid waste, water, and wastewater. GHG emissions are calculated by multiplying activity data (kilowatt-hours of electricity, tons of solid waste) by an emissions factor. For these sectors, methods used in this inventory were based on the ICLEI Community Protocol standard methods, with modifications based on regional- or city-specific data when available.

Section 2 provides a summary of the GHG emissions based on the methods. More details on methods, input data, and emissions factors are provided in Section 3. The methods used to make BAU emission projections are provided in Section 4.

2 SUMMARY OF GHG EMISSIONS

In 2013, the total GHG emissions from the City of Oceanside were **717,960 metric tons CO_2e (MT CO_2e)**, distributed into six sectors as shown in Figure 1. The per capita emission was 4.2 MT CO_2e.[3] The

[1] IPCC Forth Assessment Report: Climate Change 2007. Direct Global Warming Potentials. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

[2] ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). http://icleiusa.org/tools/ghg-protocols/

[3] Per capita emission in 2013 was calculated based on total 2013 emissions (717,960 MT CO_2e) and population (169,996) in Oceanside. The 2013 total population is from SANDAG's 2013 Estimates. The SANDAG Population Estimates are released annually and modified based on *E-5 Population and Housing Estimates for Cities, Counties, and the State*. California Department of Finance. SANDAG Data Surfer. http://datasurfer.sandag.org/ Download Date: 01/18/16

electricity sector contributed the most to overall GHG emissions (36%), followed by the transportation sector (29%), while the wastewater sector contributed the least (1%).

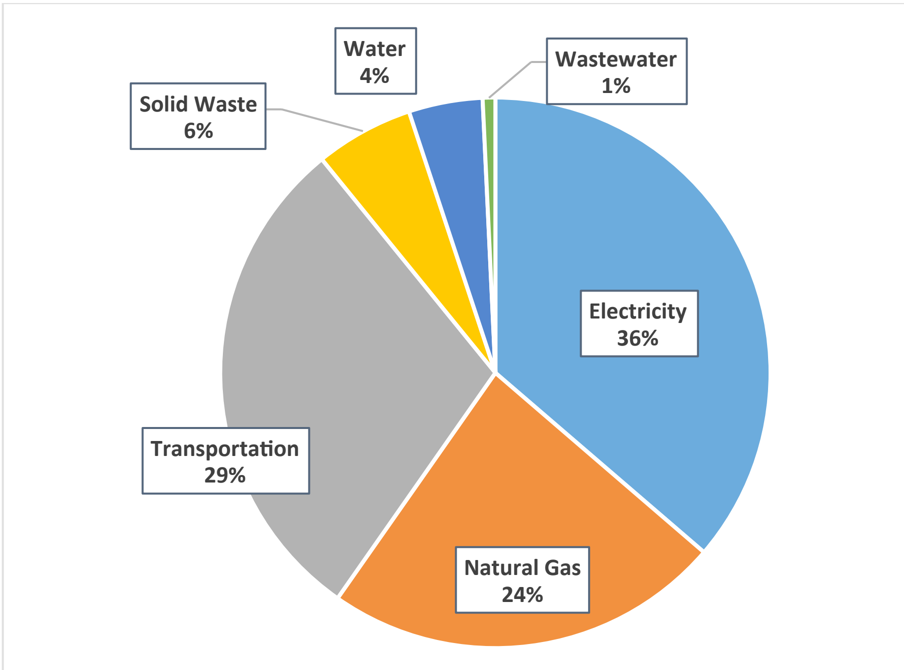

Figure 1 Breakdown of GHG Emissions in City of Oceanside by Sector (2013)

3 SUMMARY OF METHODS BY SECTOR

3.1 Electricity

GHG emissions from electricity consumption by the City of Oceanside were estimated using method BE.2 Emissions from Electricity Use, from the ICLEI Community Protocol.[4] Electricity consumption in the City of Oceanside was provided by the local utility, San Diego Gas & Electric (SDG&E), for three customer classes: residential, commercial, industrial.[5] Two modifications were made to the consumption for this inventory. First, the annual electricity consumption obtained from SDG&E was grossed up, using a loss factor[6] of 1.067 to account for transmission and distribution losses.[7] Second, in order to avoid double counting, the portion of electricity consumption associated with water treatment and distribution was subtracted from the electricity sector and attributed to the water sector.

[4] ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix C: Built Environment Emission Activities and Sources. http://icleiusa.org/tools/ghg-protocols/

[5] Communication with SDG&E. Data provided to EPIC on 11/25/15.

[6] Transmission and Distribution Loss Factor is used to scale end-use demand or retail sales to produce net energy for load (gross generation). Wong (2011). *A review of transmission losses in planning studies.* CEC Staff Paper. http://www.energy.ca.gov/2011publications/CEC-200-2011-009/CEC-200-2011-009.pdf

[7] California Energy Commission (CEC). *California Energy Demand 2015-2025 Final Forecast Mid-Case Final Baseline Demand Forecast Forms*. SDG&E Mid. Download Date: 06/23/15. The transmission and distribution loss factor, 1.067, is calculated based on the ratio of gross generation and total consumption in 2013 from SDG&E Form 1.2 Mid. http://www.energy.ca.gov/2014_energypolicy/documents/demand_forecast_cmf/Mid_Case/

The modified electricity consumption was multiplied by the electricity emission factor for Oceanside in 2013, given in Table 2, expressed in pounds of CO_2e per megawatt-hour (lbs CO_2e/MWh). For a given year, the electricity emissions factor is developed specifically for the city, using the city specific power mix of SDG&E bundled power (MWh)[8], Direct Access power (MWh)[9], and their respective emission factors (lbs CO_2e/MWh). The SDG&E bundled emission factor was calculated using Federal Energy Regulatory Commission (FERC) Form 1[10] and California Energy Commission (CEC) Power Source Disclosure Program[11] on SDG&E owned and purchased power, and U.S. EPA Emissions and Generating Resource Integrated Database (eGRID)[12] on specific power plant emissions. The Direct Access emission factor is calculated based on CPUC Decision D.14-12-037[13].

The total electricity consumption, electricity emission factor, and corresponding GHG emissions in the City of Oceanside in 2013 are given in Table 2.

Table 2 Electricity Consumption, Emissions Factor and GHG Emissions in Oceanside (2013)

Electricity Consumption (MWh)	731,121
Emission Factor (lbs CO_2e/MWh)	737
GHG Emissions (MT CO_2e)	**260,631**

The total emissions from electricity consumption can be broken down further into residential, commercial and industrial customer classes, given in Figure 2. In 2013, residential customers contributed the most (45%) to total emissions in electricity sector, industrial customers contribute the least (13%).

[8] SDG&E bundled power includes the electricity from SDG&E owned power plants and the electricity from its net procurements.

[9] Direct Access Program includes the electricity customers purchased from electric service providers (ESPs) but SDG&E provides transmission and distribution services. http://www.sdge.com/customer-choice/electricity/direct-access-faq

[10] Federal Energy Regulatory Commission (FERC). Form 1- Electricity Utility Annual Report. http://www.ferc.gov/docs-filing/forms/form-1/viewer-instruct.asp. Downloaded Date: 07/20/2015

[11] California Energy Commission (CEC) Power Source Disclosure Program under Senate Bill 1305. http://www.energy.ca.gov/sb1305/ Obtained SDG&E annual report, 2010-2014, from CEC staff on 08/07/2015.

[12] U.S. EPA. eGRID 2012. (2015) http://www2.epa.gov/energy/egrid Download Date: 10/09/2015

[13] Decision 14-12-037, December 18, 2014 in Rulemaking 11-03-012 (Filed March 24, 2011). http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M144/K130/144130487.pdf

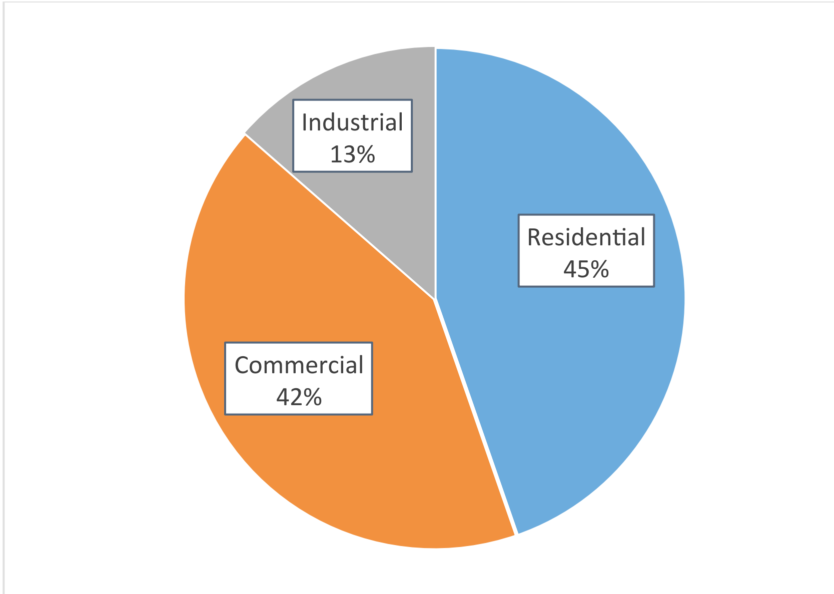

Figure 2 Breakdown of GHG Emissions from the Electricity Sector in City of Oceanside (2013)

3.2 Natural Gas

GHG emissions from combustion of natural gas for end-uses applications in City of Oceanside were estimated based on method BE.1 Emissions from Stationary Fuel Combustion of the ICLEI Community Protocol.[14] Natural gas consumption in the City of Oceanside was provided by SDG&E for three customer classes: residential, commercial and industrial.[15]

Natural gas consumption in 2013 was multiplied by the natural gas GHG emission factor, given in Table 3, expressed in million metric ton CO_2e per million therm (MMT CO_2e/MMTherm). For a given year, the natural gas emission factor is calculated based on the heat content of natural gas, fuel CO_2, CH_4, and N_2O emission from the latest California's Greenhouse Gas Inventory developed by California Air Resources Board (ARB)[16], and GWP of CH_4, and N_2O from Table 1.

The total natural gas consumption, emission factor, and corresponding GHG emissions in the City of Oceanside, 2013, are given in Table 3.

Table 3 Natural Gas Consumption, Emission Factor and GHG Emissions in Oceanside (2013)

Natural Gas Consumption (MMTherms)	30.7
Emission Factor (MMT CO_2e/MMTherms)	0.0055
GHG Emissions (MT CO_2e)	**168,164**

[14] ICLEI 2012. See Note 4.
[15] Communication with SDG&E. Data provided to EPIC on 11/25/15.
[16] ARB. 2014. Documentation of California's Greenhouse Gas Inventory. 8th Edition. Fuel Combustion – Natural Gas. http://www.arb.ca.gov/cc/inventory/doc/docs1/1a1ai_instategenerationutilityowned_fuelcombustion_naturalgas_ch4_2013.htm

The total emissions from natural gas consumption can be broken down further into residential, commercial and industrial customer classes, given in Figure 3. In 2013, residential customers contributed the most (65%) to total emissions from natural gas sector, industrial customers contribute the least (4%).

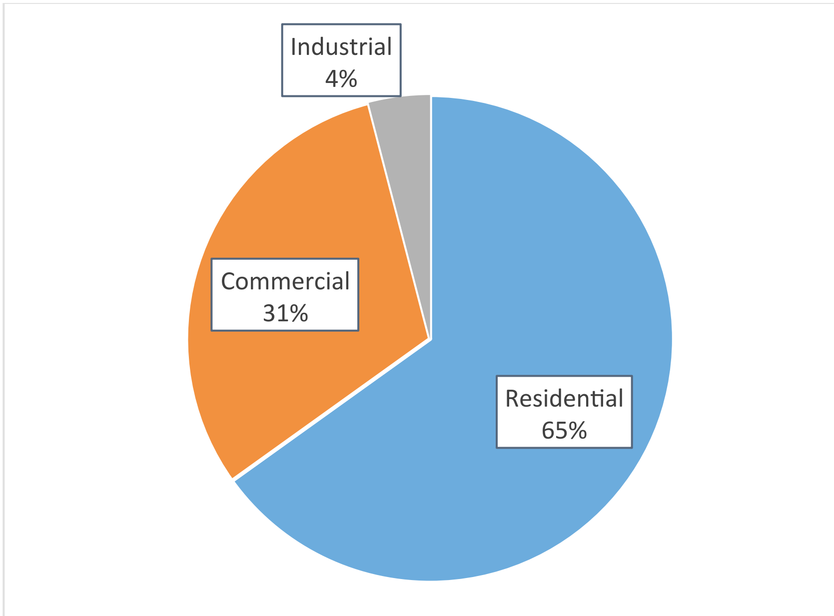

Figure 3 Breakdown of GHG Emissions from Natural Gas Sector in City of Oceanside (2013)

3.3 Transportation

GHG emissions from transportation in the City of Oceanside were estimated based on vehicle miles traveled (VMT) and the emission rates associated with the vehicle fleet in 2013. VMT in the City of Oceanside was provided by San Diego Association of Government (SANDAG), based on its activity-based model[17] and the Origin-Destination (O-D) method. The O-D VMT method proposed by the ICLEI Community Protocol estimates miles traveled based on where a trip originates and where it ends to accurately allocate on-road emissions to cities and regions with policy jurisdiction over miles traveled (Figure 4).[18]

[17] SANDAG Activity Based Model. http://www.sandag.org/index.asp?subclassid=120&fuseaction=home.subclasshome

[18] ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix D: Transportation and Other Mobile Emission Activities and Sources.

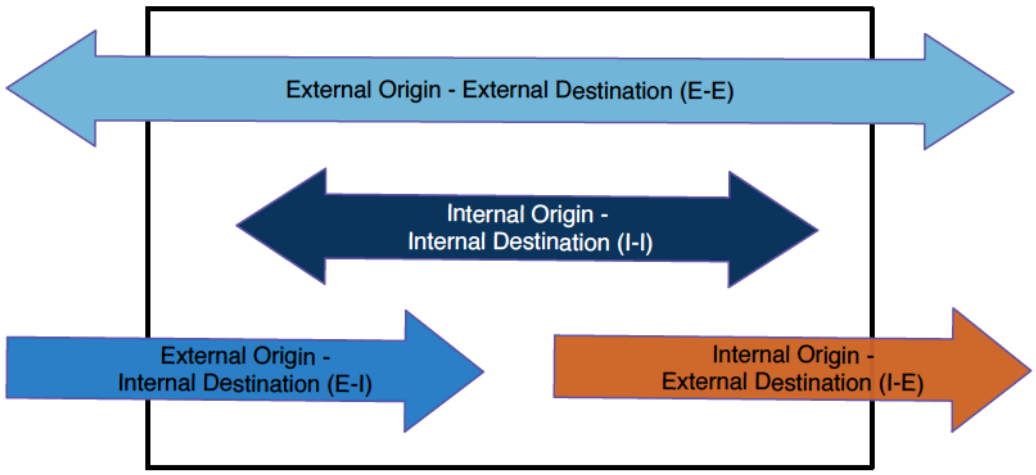

Figure 4 Components of Origin-Destination (O-D) method for Calculation of Vehicle Miles Traveled

O-D VMT include trips that originate and end within the boundary, in this case within the City of Oceanside (referred to as Internal-Internal), and trips that either begin within the boundary and end outside the boundary (referred to as Internal-External) or vice versa (referred to as External-Internal). VMT from trips that begin and end outside the boundary that were only passing through the City of Oceanside (referred to as External-External) were excluded. Emissions from External-External VMT were not allocated to the City of Oceanside. Series 13 O-D VMT data for each trip type in 2013 are given in Table 4.[19]

Table 4 Original-Destination (O-D) VMT for Trips in Oceanside (2013)

Trip Type	VMT (miles/weekday)
Internal-Internal	631,178
External-Internal/Internal-External	1,269,516
External-External	980,792

To calculate total VMT, all Internal-Internal VMT were included. External-Internal/Internal-External VMT were divided by two to evenly allocate the miles to the outside jurisdictions. The total VMT were multiplied by 0.96 to adjust from average weekday VMT to average daily VMT including weekends.[20]

The emission rate in grams CO_2e/mile was derived from the statewide mobile source emissions inventory EMFAC2014, developed by California Air Resources Board (ARB).[21] EMFAC2014 was used to generate emission rates for SANDAG on a metropolitan planning organization (MPO) basis, for calendar

[19] Communication with SANDAG. 2012 and 2014 O-D VMT Data provided to EPIC on 01/15/2016. 2013 data was interpolated linearly based on 2012 and 2014 data.
[20] The "5 to 7 day conversion" factor for VMT for freeways and highways, was provided by Caltrans, Kim Sturmer (2009).
[21] California Air Resources Board. Mobile Source Emissions Inventory. EMFAC2014 (2015). http://www.arb.ca.gov/msei/msei.htm

year 2013 with all vehicle classes (EMFAC2011 Categories), model years, speed and fuel types.[22] The fleetwide g CO_2/mile emission rate was calculated based on the distribution of VMT for each vehicle class and its emission rates, then adjusted to account for total greenhouse gas emissions including CO_2, CH_4 and N_2O.[23] Table 5 summarizes the fleetwide emission rate, total VMT and corresponding GHG emissions in 2013.

Table 5 Total VMT, Emission Rate and GHG Emissions in Oceanside (2013)

Total VMT (miles/day)	1,215,298
Emissions Rate (g CO_2e /mile)	476.0
GHG Emissions (MT CO_2e)	**211,163**
VMT Excluded (miles/day)	941,560
GHG Emissions Excluded (MT CO_2e)	163,600

The total emissions from transportation, 211,163 MT CO_2e, can be broken down further by vehicle class (EMFAC2011 Categories), given in Figure 5. The emission distribution of each vehicle class was estimated based on EMFAC2014 with the same criteria as vehicle fleet emission rate. Passenger cars contributed the most to total emissions in the on-road transportation sector with 38.4% (81,128 MT CO_2e), while motorcycles contributed the least with 0.3% (569 MT CO_2e).[24]

[22] EMFAC2014 Web Database. Emission Rates for SANDAG, Calendar Year 2013. Download Date: 01/15/2016 http://www.arb.ca.gov/emfac/2014/

[23] The conversion factor, 1.01, was calculated based on the ratio of CO_2 emissions to total greenhouse gas emissions (CO_2, CH_4 and N_2O expressed as CO_2e) using method from EPA GHG Equivalencies Calculations and References (http://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references). Emissions were from mobile fossil fuel combustion in transportation end-use sector in 2013, on-road emissions. EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013.* (2015). Table 3-12 to 3-14. http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf

[24] In EMFAC2011 Vehicle Categories, passenger cars are cars of all types using all fuel types and designated as LDA. LDTs are light duty trucks divided into LDT1 and LDT2, where LDT1 includes gas, diesel and electric fuel trucks while LDT2 does not include electric fuel. Medium duty trucks, MDTs, included MDV (5751-8500 lbs) and motor homes. Heavy duty trucks, HDTs, weight from 8,500 to 60,000 lbs. http://www.arb.ca.gov/msei/modeling.htm

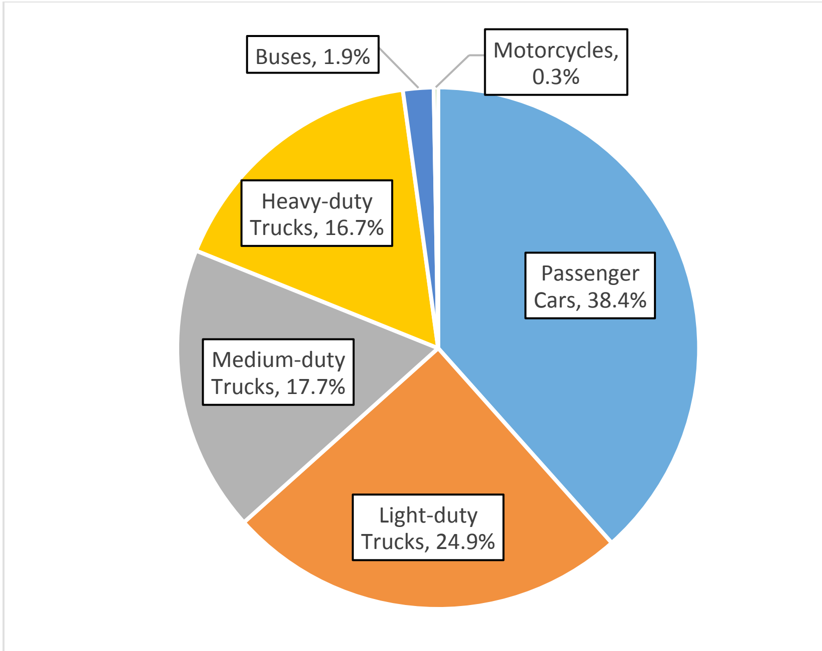

Figure 5 Breakdown of Emissions from Transportation Sector in City of Oceanside (2013)

3.4 Solid Waste

GHG Emissions from the decomposition of organic material in waste disposed at landfills are broken down to two parts in the solid waste sector: emissions from community-generated mixed waste based on method SW.4 from ICLEI Community Protocol, wherever it is disposed, and emissions from biodegradable waste that is in place at in-boundary landfills, based on method SW.1 from ICLEI Community Protocol. [25]

For emissions from community-generated mixed waste, solid waste disposed by in the City of Oceanside was multiplied by the mixed waste emission factor[26] to estimate the total emissions. The impact of recycling and composting diversion programs on emissions reduction were not captured in this inventory because the waste disposed data already exclude waste diverted from these programs.[27] The recycling and diversion programs contribute to lowering the amount of community-generated waste sent to the landfills.[28]

[25] ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix E: Solid Waste Emission Activities and Sources. http://icleiusa.org/tools/ghg-protocols/

[26] ICLEI Community protocol. Appendix E: Solid Waste Emission Activities and Sources. Table SW.5 CH_4 Yield for Solid Waste Components.

[27] City of Oceanside has achieved a 72% Diversion/Recycling rate and anticipates a 75% diversion rate by 2020. https://www.ci.oceanside.ca.us/gov/water/services_programs/recycling/mandate.asp

[28] ICLEI, 2012. See 25.

Solid waste disposed into landfills in 2013 was obtained from California Department of Resources Recycling and Recovery (CalRecycle) Disposal Reporting System (DRS)[29]. Most of the solid waste from the City of Oceanside was disposed in El Sobrante Landfill and Otay Landfill. The total waste disposed was multiplied by mixed solid waste emission factor, 0.06 MT CH_4/wet short ton[30] then converted to MT CO_2e. The landfill gas capture rate was assumed to be 75% based on ICLEI Community Protocol.[31] The total and per capita solid waste disposed, and post-capture emissions in 2013 are given in Table 6.

Table 6 Solid Waste Disposed by Oceanside and GHG Emissions (2013)

Community Solid Waste Generation (metric tons)	109,332
Per Capita Solid Waste Generation (kg/day)	1.8
GHG Emissions (MT CO_2e)	40,675

For in-boundary landfills, emissions from landfill waste-in-place are included, regardless of where waste accepted by the landfills was generated. There are two landfills in the City of Oceanside boundary, Maxson Street Landfill and Mission Avenue Landfills, both closed at 1969. Emissions were estimated using the Landfill Emissions Tool developed by ARB[32] with the first-order-decay (FOD) model[33], the landfill waste-in-place[34] and the default landfill gas capture rate.[35] The post-capture emissions from both in-boundary landfills are given in Table 7.

Table 7 GHG Emissions from in-boundary Landfills in Oceanside (2013)

Landfills	GHG Emissions (MT CO_2e)
Mission Avenue Landfill	462
Maxson Street Landfill	346
Total	808

The total GHG emissions in the solid waste sector, from community generated waste and in-boundary landfills, were **41,483 MT CO_2e** in 2013. 98% of emissions were from community-disposed waste.

[29] CalRecycle. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx Download Date: 08/03/2015

[30] ICLEI, 2012. Table SW.5. See Note 26.

[31] ICLEI, 2012. See Note 25.

[32] ARB. Landfill Methane Control Measure. Landfill Emissions Tool Version 1.3 (2011) http://www.arb.ca.gov/cc/landfills/landfills.htm Download Date: 10/05/15

[33] IPCC Guidelines for National Greenhouse Gas Inventories. Chapter 3: Solid Waste Disposal. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf

[34] Waste-in-place at both landfills were based communication with Larry Hunsaker. ARB. Data provided to EPIC on 03/20/08. Both landfills have estimated operation date from 1942-1969 (http://www.arb.ca.gov/regact/2009/landfills09/appf.pdf). Waste-in-place were divided by total operation years to get annual disposal tonnage.

[35] ICLEI, 2012. See Note 25.

3.5 Water

Emissions from water supplied to the City of Oceanside were estimated based on method WW.14 from the ICLEI Community Protocol.[36] The method accounts for each element of the water system (upstream supply and conveyance, groundwater extraction, local water distribution, and treatment) individually, using the energy intensity per unit of water for each segment of the water system given in Table 8.

Table 8 Energy Intensity for Each Segment of Water System

Segment of Water System	Energy Intensity (kWh/Million Gallons)
Upstream Supply and Conveyance[37]	9,727
Groundwater Extraction[38]	1,820
Conventional Water Treatment[39]	684
Advance Water Treatment with Reverse Osmosis[40]	3,600
Local Water Distribution[41]	292

City's Water Utility Department is responsible for purchasing and delivering water throughout the city. In 2013, the total water supplied to the City of Oceanside was 9,388 million gallons (151 gallons/person/day) including agricultural use.[42] The breakdown of water source is given in Figure 6 below.[43]

[36] ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix F. Wastewater and Water Emission Activities and Sources.

[37] California Energy Commission (CEC), *Navigant, Refining Estimates of Water-Related Energy Use in California* (December 2006).

[38] California Public Utility Commission (CPUC). *Embedded Energy in Water Studies 1, 2 and 3. Groundwater Energy Use. (2011).* Convert from Energy Intensity for South Coast Hydrologic Region, 593 kWh/AF. http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V/Embedded+Energy+in+Water+Studies1_and_2.htm

[39] Conventional water treatment processes include coagulation/flocculation, sedimentation, filtration and disinfection. Energy intensity of standard treatment are calculated based on data from City of San Diego's three Water Treatment Plants, provided to EPIC in 2014. (Value for 2010)

[40] The advance water treatment is specifically the energy requirement for brackish groundwater desalination with reverse osmosis. The source water salinity in San Diego region is 1000-3000 mg/L, the average of energy intensity between 3000-4200 kWh/million gallon was taken. WaterReuse Research Foundation. *Implications of Future Water Supply Sources for Energy Demands.* (2012) Table. 4.5. http://www.pacinst.org/wp-content/uploads/2013/02/report19.pdf

[41] City of San Diego. See Note 39.

[42] Total water supplied to the City of Oceanside and source of the water supply was provided from communication with Teresa Gomez. City of Oceanside. Data provided to EPIC on 12/04/15.

[43] Total and breakdown of water supplied to City of Oceanside in 2013 was provided by Teresa Gomez, City of Oceanside. Data provided to EPIC on 12/04/15.

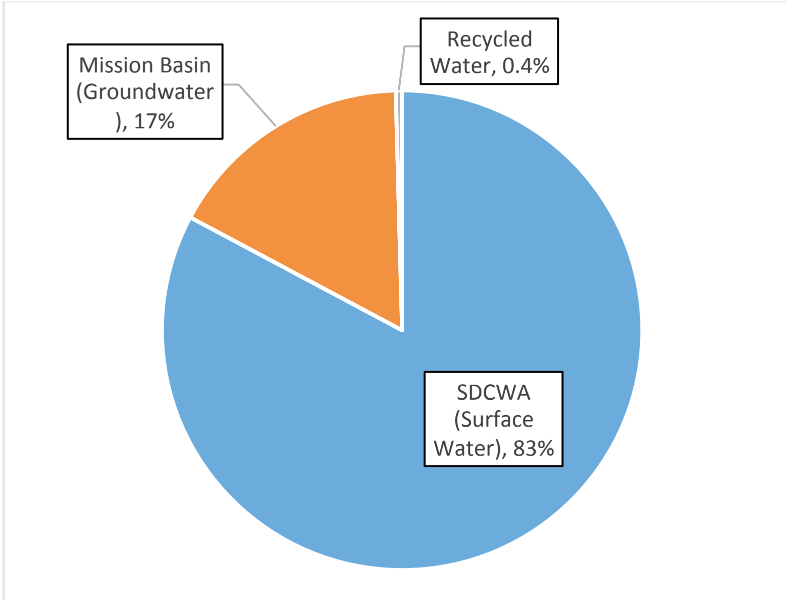

Figure 6 Breakdown of Water Sources Supplied to Oceanside (2013)

83% water supply (7,773 million gallons) was imported raw and treated surface water from the San Diego County Water Authority (SDCWA). Based on City of Oceanside's Urban Water Management Plan, the raw water purchased from SDCWA was treated at its Robert A. Weese Filtration Plant. 17% water supply (1,575 million gallons) was local brackish groundwater from Mission Basin, treated at City's Mission Basin Groundwater Purification Facility. The remaining 0.4% recycled water supply (39.7 million gallons) was from City's San Luis Rey Wastewater Treatment Plant (SLR WWTP).[44] The water source supplied to City of Oceanside is given in Table 9.

Table 9 Water Source and Supplied to Oceanside (2013)

Total Water Supplied (million gallons/year)	9,388
Groundwater	*1,575*
Surface Water	*7,773*
Recycled Water	*39.7*
Per Capita Water Supplied (gal/person/day)	151

For surface water supply, both SDCWA's water treatment plant and Robert A. Weese Filtration Plant are outside City of Oceanside boundary and have conventional water treatment processes. The total surface water supplied was multiplied by the upstream energy intensity, conventional water treatment energy intensity, and local distribution energy intensity to obtain the total electricity consumption. The

[44] City of Oceanside. *2010 Urban Water Management Plan.* (2011) http://www.ci.oceanside.ca.us/gov/water/admin/uwmp.asp

electricity consumption was then multiplied by the SDG&E service territory electricity emission factor in 2013 (747 lbs CO_2e/MWh) to calculate GHG emissions.[45]

For groundwater supply, Mission Basin Groundwater Purification Facility is located inside city boundary and has advance membrane treatment for the brackish groundwater. The total groundwater supplied was multiplied by the groundwater extraction energy intensity, advance water treatment energy intensity, and local distribution energy intensity to obtain the total electricity consumption. All segments associated with groundwater were inside the city boundary, therefore the City of Oceanside electricity emission factor in 2013 was used to calculate GHG emissions.

For recycled water supply, it is assumed that after the tertiary treatment in SLR WWTP, the recycled water was directly supplied for non-potable use with no further water treatment needed.[46] The total recycled water supplied was multiplied only by the local distribution energy intensity to obtain electricity consumptions and then GHG emissions.

All electricity associated with groundwater supply, recycled water supply, and local distribution of surface water supply is inside the city boundary, therefore is already captured in the electricity sector. This electricity consumption and GHG emissions were deducted from the electricity sector to avoid double counting. The total GHG emissions from the water sector in 2013 were **31,188 MT CO_2e**. The breakdown of emissions in each segment of the water system is given in Figure 7. 82% of emissions from water sector in 2013 (25,619 MT CO_2e) were from upstream supply and conveyance for surface water.

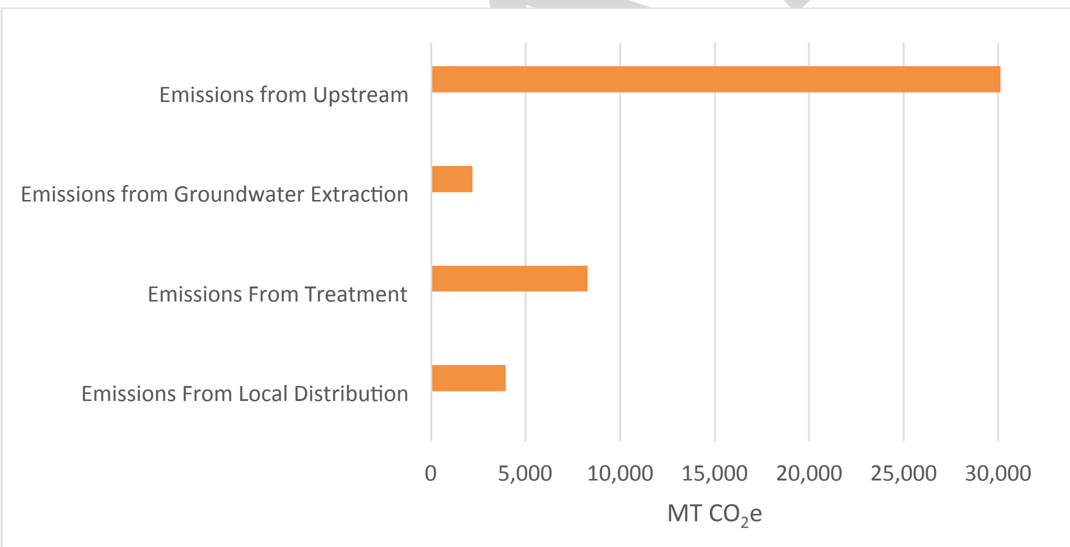

Figure 7 Breakdown of Emissions from Water Sector in City of Oceanside (2013)

[45] SDG&E service territory electricity emission factor is the best available emission factor to represent the region outside city boundary but still in SDG&E service territory.
[46] Based on City of Oceanside's 2010 UMWP, the recycled water is pumped to city's municipal gold course or Whelan Lake. See Note 44.

3.6 Wastewater

GHG emissions from wastewater generation by the City of Oceanside were estimated based on the total amount of wastewater generated in a given year, multiplied by the emission factor of wastewater treatment processes. All wastewater generated by the City of Oceanside is collected by the City's Water Utilities Department, Wastewater Division, and treated at either San Luis Rey Wastewater Treatment Plant (SLR WWTP) or La Salina Wastewater Treatment Plant (La Salina WWTP).[47]

The wastewater treated by each WWTP for the City of Oceanside in 2013 is given in Table 10. The wastewater treated at SLR WWTP was modified to exclude the wastewater inflow from Rainbow Municipal Water District and City of Vista. All wastewater treated at La Salina WWTP was from City of Oceanside.[48]

Table 10 Oceanside Wastewater Generation and Treatment Facilities (2013)

Wastewater Treatment Facility	Wastewater Flow from Oceanside (Million Gallons)
La Salina WWTP	1,084
SLR WWTP*	2,808
Total	3,892

*Modified

The emission factors of wastewater treatment processes for SLR WWTP and La Salina WWTP were collected from plant operators via surveys during the preparation of government operations inventory. The emissions include 1) stationary methane emissions from anaerobic digester 2) process N_2O emissions from aerobic processes. The total emissions, effluent flow and emission factor are given in Table 11.[49]

Table 11 Emissions, Flow and Emissions Factor for Oceanside Wastewater Treatment Facilities (2013)

	La Salina WWTP	SLR WWTP
Total Emissions (MT CO_2e)	1,220	2,779
Effluent (Million Gallons)	1,084	3,084
Emissions Factor (MT CO_2e /Million Gallons)	1.13	0.90

The total and per capita wastewater generation, and corresponding emissions in 2013 are given in Table 12.

[47] City of Oceanside. Wastewater Division Overview. http://www.ci.oceanside.ca.us/gov/water/waste/default.asp
[48] The wastewater inflow to each WWTP and its origin was provided from communication with Teresa Gomez. City of Oceanside. Data provided to EPIC on 10/19/15.
[49] The survey on wastewater treatment process was part of the preparation for government operation inventory, and the data were provided by City of Oceanside. The effluent flow at two WWTPs was collected during the preparation for this community inventory.

Table 12 Wastewater Generation and GHG Emissions in Oceanside (2013)

Community Wastewater Generation (million gallons/year)	3,892
Per Capita Wastewater Generation (gallon/day)	63
GHG Emissions (MT CO_2e)	5,332

4 EMISSION FORECAST TO 2020, 2030 AND 2035

GHG emissions inventories provide a retrospective view of emissions within a city; however, to best plan for future reduction opportunities, emissions are often projected using information about a city's anticipated growth and development but without additional changes to policy at the baseline year. Such projections are often known as business-as-usual (BAU) projections. The total GHG projections are the sum of the emissions projected by sector for year 2020, 2030 and 2035.

4.1 Summary of Emission Forecasts

The total GHG emissions in 2020 were projected to be 693,037 MT CO_2e, 3% lower than emissions in 2013. GHG emissions in 2035 were projected to be 740,219 MT CO_2e, 3% higher than emissions in 2013. This is due to the changes in growth and development in each sector, as well as changes in the emission factor in each sector. Figure 8 below shows a comparison of the emissions breakdown by sector for inventory year 2013 and forecast years 2020, 2030 and 2035.

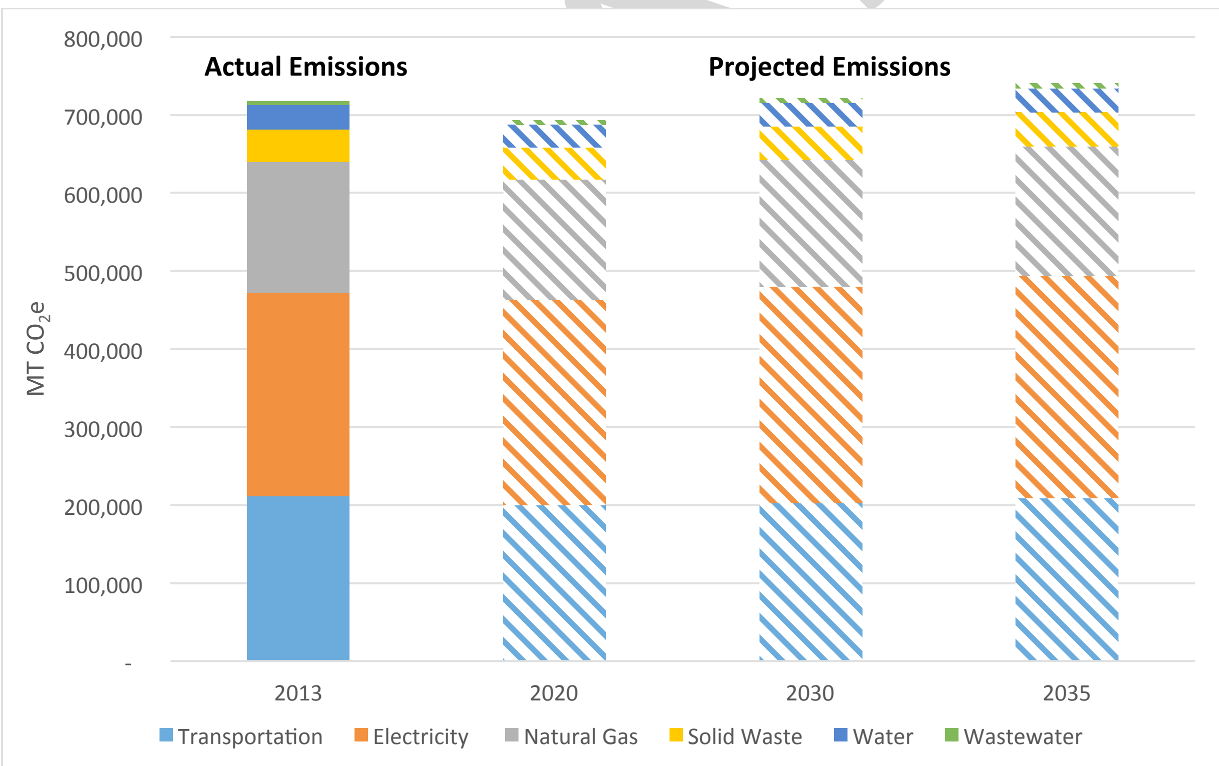

Figure 8 Comparison of Emissions Breakdown by Sector in Oceanside (2013, 2020, 2030 and 2035)

4.2 Summary of Projection Methods by Sector

In general, SANDAG Series 13 Regional Growth Forecast[50] was used to obtain the population and job growth in City of Oceanside. The population and job forecast for the City of Oceanside is given in Table 13.

Table 13 Population and Job Forecast for Oceanside (2020, 2030 and 2035)

Year	Population	Commercial Jobs[51]	Industrial Jobs[52]
2020	177,840	42,658	4,887
2030	185,859	45,625	5,068
2035	188,597	47,491	5,183

Each sector was projected to 2035 separately using a method specifically for the sector. Data from inventory year (2013) or latest available data year (2014) were used and kept constant for all years through 2035.

4.2.1 Electricity

Electricity consumption in the City of Oceanside was projected separately for residential, commercial and industrial customers. For residential customer class, the per capita electricity consumption in 2014 (1,931 kWh/person/year), the latest year with SDG&E data, was calculated by dividing the total electricity consumption in the residential class by the population in 2014.[53] The per capita electricity consumption is held constant and multiplied by forecasted population (Table 13) to project total consumption for future years.

Similar methods were used for the commercial and industrial customer classes. The total commercial electricity consumption was forecasted based on commercial job growth (Table 13) and per job electricity consumption in 2014 (8,464 kWh/commercial job/year). The total industrial electricity consumption was forecasted based on industrial job growth (Table 13) and per job electricity consumption in 2014 (29,141 kWh/industrial job/year).

The total projected electricity consumption, including residential, commercial and industrial electricity consumption, was modified to avoid double counting the projected electricity consumption associated water treatment and distribution. The resulting consumption was then multiplied by the Oceanside specific electricity emission factor calculated for 2014, 651 lbs CO_2e/MWh, held constant, to obtain the total GHG emission for all years until 2035. The projected total electricity consumption and corresponding GHG emissions for forecast years are given in Table 14.

50 SANDAG Series 13 Regional Growth Forecast. http://datasurfer.sandag.org/ Download Date. 11/25/15
51 The employment types include in commercial jobs are all except construction, manufacturing and agriculture.
52 The employment types include in industrial jobs are construction and manufacturing.
53 The 2014 total population is from SANDAG's 2014 Estimates. The SANDAG Population Estimates are released annually and modified based on *E-5 Population and Housing Estimates for Cities, Counties and the State*, California Department of Finance. SANDAG Data Surfer. http://datasurfer.sandag.org/ Download Date. 01/18/16

Table 14 Projected Electricity Consumption and GHG Emissions in Oceanside (2020, 2030 and 2035)

Year	Total Projected Electricity Consumption (GWh)	GHG Emissions (MT CO_2e)
2020	834	262,925
2030	880	277,200
2035	905	284,835

4.2.2 Natural Gas

The projection method for the natural gas sector is similar to that for the electricity sector, by each customer class separately. For residential customer class, the per capita natural gas consumption in 2014 (93 therms/person/year), the latest year with SDG&E data, was calculated by dividing the total electricity consumption in the residential class by the population in 2014. The per capita electricity consumption is held constant and multiplied by forecasted population (Table 13) to project total consumption for future years.

Similar methods were used for the commercial and industrial customer classes. The total commercial electricity consumption was forecasted based on commercial job growth (Table 13) and per job electricity consumption in 2014 (239 therms/commercial job/year). The total industrial electricity consumption was forecasted based on industrial job growth (Table 13) and per job electricity consumption in 2014 (276 therms/industrial job/year).

The total projected electricity consumption was then multiplied by the natural gas emission factor used in Section 3.2, held constantly, to obtain the total GHG emission for all years until 2035. The projected total natural consumption and corresponding GHG emissions for forecast years are given in Table 15.

Table 15 Projected Natural Gas Consumption and GHG Emissions in Oceanside (2020, 2030 and 2035)

Year	Total Projected Natural Gas Consumption (MMTherms)	GHG Emissions (MT CO_2e)
2020	28.2	154,153
2030	29.7	162,412
2035	30.4	166,430

4.2.3 Transportation

Vehicle Miles Traveled (VMT) forecasts for 2014, 2015, 2020 and 2035 in the City of Oceanside were provided by SANDAG based on its Series 13 activity based model. 2030 and other intermediate years were interpolated linearly. VMT was multiplied by the adjusted GHG emission rate derived from EMFAC2014 for all years until 2035. Two adjustments were made on the emission rate derived from EMFACT2014. First, the electric vehicle penetration rate in 2014 was kept constant for all years until 2035.[54] Second, for new vehicles entering the fleet after calendar year 2014, including all vehicle classes

[54] Using fixed electric vehicle penetration rate in 2014 avoids including the impact of the ZEV (Zero Emission Vehicle) program on BAU projection. The ZEV program requires manufacturers to make and sell ZEVs that will increase VMTs driven by ZEVs. The 2014 electric vehicle penetration rate was calculated based on the ratio of VMT

and fuel types, their emission rates equal to new model year 2014 vehicles emission rates (calendar year 2014 and vehicle year 2014).[55] The total VMT, adjusted emission rate and corresponding GHG emissions for forecast years are given in Table 16.

Table 16 Total VMT, Adjusted Emission Rate and GHG Emissions in Oceanside (2020, 2030 and 2035)

Year	Total VMT (miles/day)	Emissions Rate (g CO_2e/mile)	GHG Emissions (MT CO_2e)
2020	1,304,611	428.7	199,987
2030	1,393,707	406.5	202,564
2035	1,438,255	405.7	208,659

4.2.4 Solid Waste

The solid waste generation in the City of Oceanside was projected using the population growth and the per capita solid waste generated (1.68 kg/person/day) in 2014, the latest year with available data. Total emissions were calculated by multiplying solid waste generation and the default mixed waste emission factor and gas capture rate provided in Section 3.4. The emissions from waste-in-place were projected using the Landfill Emission Tool developed by ARB. The projected GHG emissions from in-boundary landfills and solid waste generation for the forecast years are given in Table 17.

Table 17 Projected GHG Emissions from Waste Generation and In-boundary Landfills in Oceanside (2020, 2030 and 2035)

Year	GHG Emission from Solid Waste Generation (MT CO_2e)	GHG Emission from In-Boundary Landfills (MT CO_2e)	Total GHG Emissions (MT CO_2e)
2020	40,675	702	41,378
2030	42,509	548	43,057
2035	43,135	472	43,607

4.2.5 Water

The total water supplied to the City of Oceanside was determined using the same method as in the above solid waste section, based on per capita water supplied and population growth. The per capita water supplied (151 gallon/person/day) in 2013, the latest year with data available, energy intensity for each element of the water system (Table 8), electricity emission factors were held constant for all years until 2035. The projected total water supplied and the corresponding GHG emissions for the forecast years are given in Table 18.

driven by ZEV in passenger car level and VMT driven by all passenger cars (gasoline, diesel and electricity). EMFAC2014. Technical Documentation. Section 3.2.2.4.3. http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf

[55] Avoid the impact of other vehicle regulations on BAU projection.

Table 18 Projected Water Supplied and GHG Emissions in Oceanside (2020, 2030 and 2035)

Year	Total Water Supplied (million gallons)	GHG Emissions (MT CO_2e)
2020	9,821	29,018
2030	10,264	30,326
2035	10,415	30,773

4.2.6 Wastewater

The total wastewater generation in the City of Oceanside was determined using the same method as the solid waste and water sections, based on per capita wastewater generation and population growth. The per capita wastewater generation (63 gallon/person/day) in 2013, the latest year with data available, and wastewater emission factor in SLR WWTP and La Salina WWTP were held constant for all years until 2035. The projected total wastewater generation and the corresponding GHG emissions for the forecast years are given in Table 19.

Table 19 Projected Wastewater Generation and GHG Emissions in Oceanside (2020, 2030 and 2035)

Year	Wastewater Generation (Million Gallons)	GHG Emissions (MT CO_2e)
2020	4,071	5,578
2030	4,255	5,829
2035	4,318	5,915

5 COMPARISON WITH 2005 INVENTORY

A GHG inventory, published in 2011, was prepared by ICLEI for the City of Oceanside using previous ICLEI methodology (International Local Government GHG Emissions Analysis Protocol) and 2005 data (referred to as the 2005 inventory). Emissions were calculated for both government operations and the community. For the community inventory, the five sectors included in the 2005 inventory were residential, commercial/industrial, transportation, solid waste and wastewater, as advised by previous ICLEI methodologies and these are different from sectors in the current ICLEI methodology (2012 ICLEI Community Protocol). The emissions by sector from the 2005 inventory and this 2013 inventory are provided in Table 20.

Table 20 Comparison of Emission Breakdown By Sector between 2005 and 2103 Inventory (MT CO_2e)

Sector	2005 Inventory (prepared by ICLEI)	2013 Inventory (prepared by EPIC)
Electricity[56]	192,686	260,631
Natural Gas	154,498	168,164
Transportation	579,873	211,163
Water	Not available	31,188
Solid Waste	31,423	41,483
Wastewater	1,292	5,332
Total Emissions	959,772	717,960
Per Capita Emissions	5.5	4.2

*Highlighted sectors cannot be directly compared for reasons described in the text

Total and per capita emissions in the 2005 Inventory are higher than in the current 2013 inventory. However, this is largely due to difference in methodologies between two inventories, therefore, a direct comparison of the total or per capita emissions is not possible. A summary of differences between methodologies by sector is given in the following.

5.1 Electricity

For the electricity sector, the emissions are calculated by multiplying electricity consumption in the community with an emission factor in both inventories. The total electricity consumption in 2013, including residential, commercial and industrial customer class, is 1% higher than the total electricity consumption in 2005.[57] However, the electricity emission factors used in two inventories are very different. The electricity emission factors used in the 2005 inventory is 546.5 lbs CO_2/MWh for SDG&E bundled electricity and 724 lbs CO_2/MWh for direct access electricity (WECC California).[58] Both emission factors are significantly lower compared with emission factors used to derive Oceanside specific

[56] Neither electricity nor natural gas is one of the five sectors in 2005 Inventory. They are sub-categories under the residential and commercial/industrial sectors, and calculated separated. The 2005 Inventory Master Data Workbook was provided by City of Oceanside to EPIC during the preparation of this community inventory.

[57] The total electricity consumption in 2013 excludes electricity consumption associated with water sector. The total electricity consumption in 2005 is from 2005 Inventory Master Data Workbook.

[58] WECC, Western Electricity Coordinating Council, one of the eight Regional Entities with delegated authority from North American Electric Reliability Corporation (NERC) and FERC.

electricity emission factors in the 2013 inventory.[59] Therefore, the total emissions from electricity sector were lower in the 2005 inventory as well.

5.2 Natural Gas

For the natural gas sector, there are no methodological differences between two inventories. The difference in emissions is due to different natural gas consumptions. The total natural consumption in 2013, including residential, commercial and industrial customer class, is 6% higher than the total natural gas consumption in 2005.[60]

5.3 Transportation

For the transportation sector, the methodologies are very different between two inventories. The current ICLEI method recommends using data of travel originating or terminating within the jurisdictional boundaries of a community, from either an activity-based regional travel demand model with trip origin and destination data or a trip-based travel demand model with trip origin and destination data (four step models). The VMT used in this inventory was estimated based on the activity-based model. In the 2005 inventory, the emissions were calculated based on "local" versus "state" road categories and included miles traveled through the city. Due the difference in methodologies, no comparison can be made here.

5.4 Solid Waste

There are no methodological differences in solid waste sector between two inventories. For emissions from community waste generation, the difference in emissions is due to different waste generation. For emissions from waste-in-place, since both landfills are closed, the emissions keep decreasing through the years.

5.5 Water

Emissions from water supplied to the community were not included as a main sector in the previous ICLEI methodology, therefore mot included in 2005 inventory. No comparisons can be made here.

5.6 Wastewater

For the wastewater sector, the methodologies are very different between two inventories. The emissions from wastewater in the 2005 inventory were downscaled from the 2008 San Diego Regional GHG inventory based on the local population. In this 2013 inventory emissions were calculated based on the wastewater generation in the City of Oceanside and the facility-specific treatment emissions factors. Due the difference in methodologies, no comparison can be made here.

[59] The 2013 SDG&E bundled electricity emission factor used in this inventory is 729 lbs CO_2e/MWh. The 2013 Direct Access emission factor used in this inventory is 836 lbs CO_2e/MWh.

[60] The total natural gas consumption in 2005 is from the 2005 Inventory Master Data Workbook.

B

City of Oceanside 2013 Local Government Operations Greenhouse Gas Emissions Inventory

City of Oceanside

2013 Local Government Operations Greenhouse Gas Emissions Inventory

Conducted by:

Basma Gaber, CivicSpark Americorps Program
In partnership with
The San Diego Regional Climate Collaborative
and SANDAG

February 2016

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Executive Summary

The Purpose of Conducting an Inventory

Each day, local governments operate buildings, vehicle fleets, street lights, traffic signals, water systems, and wastewater plants; local government employees consume resources commuting to work and generate solid waste which is sent for disposal. All of these activities directly or indirectly cause the release of carbon dioxide and other greenhouse gases (GHGs) into the atmosphere. This report presents the findings and methodology of a local government operations (LGO) GHG emissions inventory for the City of Oceanside. The inventory measures the GHG emissions resulting specifically from Oceanside's government operations, arranged by sector to facilitate detailed analysis of emissions sources. The inventory addresses where and what quantity of emissions are generated through various local government activities. Through analysis of a local government's emissions profile, the City of Oceanside can tailor strategies to achieve the most effective GHG emission reductions.

A separate GHG inventory has been prepared for the City of Oceanside to track community-scale emissions. The Energy Policy Initiatives Center (EPIC) at the University of San Diego summarized 2013 emissions from electricity, natural gas, transportation, solid waste, water, and wastewater. The City's operations make up 3 percent of Oceanside's community-wide GHG emissions. The community inventory and this municipal inventory can be used as partner documents.

Inventory Results

The following figures and tables summarize the results of the LGO GHG emissions inventory for the City of Oceanside, by sector, scope, and source.

Figure 1: 2013 Government Operations CO_2e Emissions by Sector

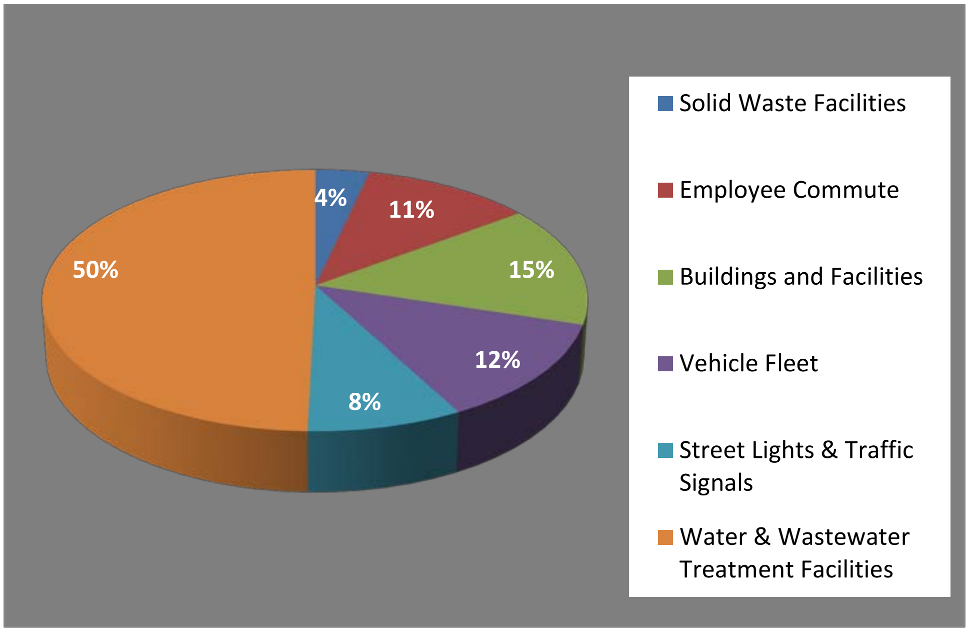


Table 1: Government Operations CO_2e Emissions by Sector (2005 vs. 2013)

Sector	2005 metric tons CO_2e	2013 metric tons CO_2e
Solid Waste Facilities	2,668	882
Water & Wastewater Treatment Facilities	8,194	12,313
Buildings and Facilities	2,772	3,720
Vehicle Fleet	1,821	3,066
Employee Commute	3,974	2,793
Street Lights & Traffic Signals	1,533	2,054
Totals	**20,963**	**24,828**

Figure 2: 2013 Government Operations CO_2e Emissions by Source

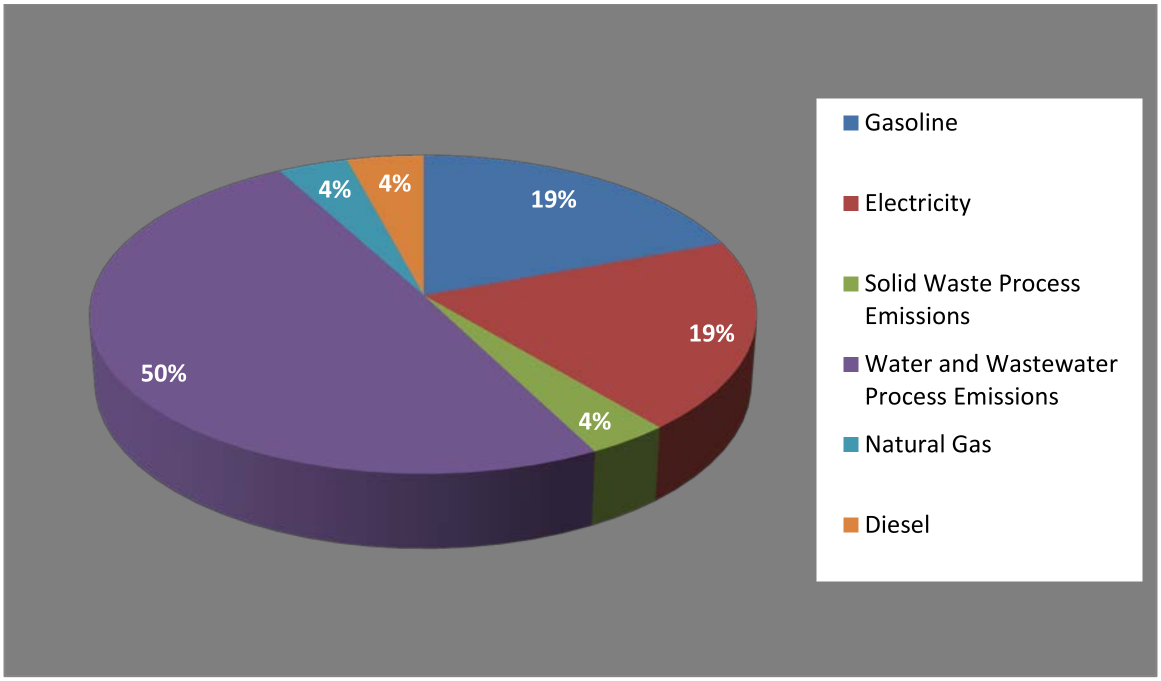


Table 2: Government Operations CO_2e Emissions by Source (2005 vs. 2013)

Source	2005 metric tons CO_2e	2013 metric tons CO_2e
Gasoline	4,778	4,811
Electricity	4,831	4,827
Solid Waste Process Emissions	2,668	882
Water and Wastewater Process Emissions	6,075	12,313
Natural Gas	1,574	945
Diesel	885	1,036

Table 3: 2013 Overall Emissions by Scope

Source	metric tons CO_2e
Scope 1	9,167
Scope 2	11,985
Scope 3	3,674

Emissions can be measured by "scope" in order to understand the entity's degree of control over the emissions' source and location. This can either be direct (Scope 1) or indirect (Scopes 2 and 3). Scope 1 includes emissions from sources within a jurisdiction's operations that it owns or controls, including process emissions, mobile combustion of fuels, stationary combustion to produce electricity, and fugitive emissions from producing and processing fuels. Scope 2 includes emissions from consumption of electricity, heating, cooling, and steam that are purchased from a utility. Scope 3 includes all other emissions sources, such as tailpipe emissions from employee commutes.

Introduction

Regional and Local Context

Climate Change Mitigation Activities in California

Since 2005, the State of California has responded to growing concerns over the effects of climate change by adopting a comprehensive approach to addressing emissions in the public and private sectors. This approach was officially initiated with the passage of the Global Warming Solutions Act of 2006 (AB 32), which requires the state to reduce its GHG emissions to 1990 levels by 2020. The AB 32 Scoping Plan was developed to identify strategies for meeting the AB 32 goal, and was adopted by ARB in December 2008. Among many other strategies, it encourages local governments to reduce emissions in their jurisdictions by 15 percent below current levels by 2020. In addition, it identifies the following strategies that will impact local governance:

- Develop a California cap-and-trade program
- Expand energy efficiency programs
- Establish and seek to achieve reduction targets for transportation-related GHG emissions
- Expand the use of green building practices
- Increase waste diversion, composting, and commercial recycling toward zero-waste
- Continue water efficiency programs and use cleaner energy sources to move and treat water
- Reduce methane emissions at landfills
- Preserve forests that sequester carbon dioxide

Other measures taken by the state include mandating stronger vehicle emissions standards (AB 1493, 2002), establishing a low-carbon fuel standard (EO # S-01-07, 2007), mandating a climate adaptation plan for the state (S-EO # 13-08, 2008), establishing a Green Collar Job Council, and establishing a renewable energy portfolio standard for power generation or purchase in the state. The state also has made a number of legislative and regulatory changes that have significant implications for local governments:

- SB 97 (2007) required the Office of Planning and Research to create GHG planning guidelines for the California Environmental Quality Act (CEQA). In addition, ARB is tasked with creating energy-use and transportation thresholds in CEQA reviews, which may require local governments to account for GHG emissions when reviewing project applications.
- AB 811 (2007) authorizes all local governments in California to establish special districts that can be used to finance solar or other renewable energy improvements to homes and businesses in their jurisdiction.
- SB 375 (2008) revises the process of regional transportation planning by metropolitan planning organizations (MPOs), which are governed by elected officials from local jurisdictions. The statute calls on ARB to establish regional transportation-related GHG targets and requires the large MPOs to develop regional "Sustainable Communities Strategies" of land use, housing and transportation policies that will move the region towards its GHG target. The statute stipulates that transportation investments must be consistent with the Sustainable Communities Strategy and provides CEQA streamlining for local development projects that are consistent with the Strategy.

Climate Change Mitigation Activities in the City of Oceanside

In 2010, the City of Oceanside adopted a Zero Waste goal of 75% to 90% by 2020. In 2012, the City adopted a Zero Waste Strategic Plan, that includes the direction to implement an expansive community based recycling program that focuses on waste reduction, reuse, recycling, and composting programs for all public spaces, City facilities, residential homes, apartments, businesses, and schools in Oceanside. Since the adoption of our Zero Waste goals, the City has increased its 57% rate to 72%, and as a result, the City boasts one of the highest diversion rates in California. Current Diversion/Recycling totals represent an actual mitigation of approximately 3,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) emissions from landfill (Base year study and emission totals were calculated in 2010, based on the EPA's Warm Model). At full implementation of the City of Oceanside's Zero Waste Plan and subsequent diversion goals by 2020, the City is anticipating reducing GHG emissions by 191,905 $MTCO_2e$ per year, the equivalent of removing 37,628 cars from Oceanside roadways each day.

In 2014, the City began a retrofitting its streetlights, replacing lights with energy-efficient LED bulbs. 7,700 lights were retrofitted, with an energy reduction of 2.6 million kilowatt hours (kWh) per year, as well as a reduction in CO_2 of approximately 1.7 million pounds per year. Since this inventory is for 2013, the emissions reduced from this retrofit project are not reflected; reductions should be seen in future GHG inventories.

General Methodology

Local Government Operations Protocol

A national standard called the Local Government Operations Protocol (LGO Protocol) has been developed and adopted by the California Air Resources Board (ARB) in conjunction with ICLEI, the California Climate Action Registry, and The Climate Registry. This standard provides accounting principles, boundaries, quantification methods, and procedures for reporting GHG emissions from local government operations. The LGO Protocol forms the basis of ICLEI's ClearPath tool, which allows local governments to compile data and perform the emissions calculations using standardized methods.

Greenhouse Gases and Carbon Dioxide Equivalent

In accordance with LGO Protocol recommendations, ClearPath calculates and reports all six internationally recognized GHGs regulated under the Kyoto Protocol (Carbon Dioxide, Methane, Nitrous Oxide, Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride). Emissions summaries found throughout this report also use ClearPath's ability to combine emissions from the various GHGs into carbon dioxide equivalent, CO_2e. Since equal quantities of each GHG have more or less influence on the greenhouse effect, converting all emissions to a standard metric, CO_2e, allows apples-to-apples comparisons amongst quantities of all six emissions types. GHG emissions are reported in this inventory as metric tons of CO_2e ($MTCO_2e$).

Table 4 exhibits the GHGs and their global warming potential (GWP), a measure of the amount of warming a GHG may cause compared to the amount of warming caused by carbon dioxide.

Table 4: Greenhouse Gases and Their Global Warming Potential

Gas	Chemical Formula	Activity	Global Warming Potential (CO_2e)
Carbon Dioxide	CO_2	Combustion	1
Methane	CH_4	Combustion, Anaerobic Decomposition of Organic Waste (Landfills, Wastewater), Fuel Handling	25
Nitrous Oxide	N_2O	Combustion, Wastewater Treatment	298
Hydrofluorocarbons	Various	Leaked Refrigerants, Fire Suppressants	12–14,800
Perfluorocarbons	Various	Aluminum Production, Semiconductor Manufacturing, HVAC Equipment Manufacturing	7,390–17,340
Sulfur Hexafluoride	SF_6	Transmission and Distribution of Power	22,800

Calculating Emissions

In general, emissions can be quantified in two ways.

1. Measurement-based methodologies refer to the direct measurement of GHG emissions from a monitoring system. Emissions measured this way may include those emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility. This method is the most accurate way of inventorying emissions from a given source, but is generally available for only a few sources of emissions.

2. Calculation-based methodologies refer to an estimate of emissions calculated based upon measurable ***activity data*** and ***emission factors***. Table 5 provides examples of common emissions calculations.

Table 5: Basic Emissions Calculations

Activity Data x	Emissions Factor =	Emissions
Electricity Consumption (kilowatt hours)	CO_2 emitted/kWh	CO_2 emitted
Natural Gas Consumption (therms)	CO_2 emitted/therm	CO_2 emitted
Gasoline/Diesel Consumption (gallons)	CO_2 emitted/gallon	CO_2 emitted
Waste Generated by Government Operations (tons)	CH_4 emitted/ton of waste	CH_4 emitted

The Scopes Framework

This inventory reports GHG emissions by sector and additionally by "scope", in line with the LGO Protocol and World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol Corporate Standard.

Scope 1: Direct emissions from sources within a local government's operations that it owns and/or controls, with the exception of direct CO_2 emissions from biogenic sources. This includes stationary combustion to produce electricity, steam, heat, and power equipment; mobile combustion of fuels; process emissions from physical or chemical processing; fugitive emissions that result from production, processing, transmission, storage and use of fuels; leaked refrigerants; and other sources.

Scope 2: Indirect emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.

Scope 3: All other emissions sources that hold policy relevance to the local government that can be measured and reported. This includes all indirect emissions not covered in Scope 2 that occur as a result of activities within the operations of the local government. Scope 3 emission sources include (but are not limited to) tailpipe emissions from employee commutes, employee business travel, and emissions resulting from the decomposition of government-generated solid waste.

ICLEI and the LGO Protocol provide standard methodologies for calculating emissions from the sources shown in the following table. Other sources of emissions, such as those associated with the production of consumed products do not yet have standard calculation methodologies and are thus excluded from this inventory.

Table 6: Inventoried Emissions Sources by Scope

Scope 1	Scope 2	Scope 3
Fuel consumed at facilities	Purchased electricity consumed by facilities	Solid waste generated by government operations
Fuel consumed by vehicle fleet and mobile equipment	Purchased electricity consumed by electric vehicles	Fuel consumed by vehicles during employee commuting
Fuel consumed to generate electricity	Purchased steam	
Leaked refrigerants from facilities and vehicles	Purchased cooling (chilled water)	
Leaked / deployed fire suppressants		
Solid waste in government landfills		
Wastewater decomposition and treatment at a municipal wastewater treatment plant		

Organizational Boundaries

The organizational boundary for the inventory determines which aspects of operations are included in the emissions inventory, and which are not. Under the LGO Protocol, two control approaches are used for reporting emissions: operational control or financial control. A local government has operational control over an operation if it has full authority to introduce and implement policies that impact the operation. A local government has financial control if the operation is fully consolidated in financial accounts. If a local government has joint control over an operation, the contractual agreement will have to be examined to see who has authority over operating policies and implementation, and thus the responsibility to report emissions under operational control.

LGO Protocol strongly encourages local governments to utilize operational control as the organization boundary for a government operations emissions inventory. Operational control is believed to most accurately represent the emissions sources that local governments can most directly influence, and this boundary is consistent with other environmental and air quality reporting program requirements. For this reason, this inventory was conducted according to the operational control framework.

Types of Emissions

As described in the LGO Protocol, emissions from each of the GHGs can come in a number of forms:

- Stationary or mobile combustion: These are emissions resulting from on-site combustion of fuels (natural gas, diesel, gasoline, etc.) to generate heat, electricity, or to power vehicles and mobile equipment.
- Purchased electricity: These are emissions produced by the generation of power from utilities outside of the jurisdiction.
- Fugitive emissions: Emissions that result from the unintentional release of GHGs into the atmosphere (e.g., leaked refrigerants, methane from waste decomposition, etc.).
- Process emissions: Emissions from physical or chemical processing of a material (e.g., wastewater treatment).

Understanding Totals

It is important to realize that the totals and sub-totals listed in the tables and discussed in this report are intended to represent all-inclusive, complete totals for Oceanside's operations. However, these totals are only a summation of inventoried emissions using available estimation methods. Each inventoried sector may have additional emissions sources associated with them that were unaccounted for, such as Scope 3 sources that could not be estimated.

Also, local governments provide different services to their citizens, and the scale of the services (and thus the emissions) is highly dependent upon the size and purview of the local government. For these reasons, comparisons between local government totals should not be made without keen analysis of the basis for figures and the services provided.

Inventory Results

Emissions Total

In 2013, Oceanside's GHG emissions from government operations totaled 22,241 metric tons of CO_2e. This number represents a roll-up of emissions. While the roll-up is a valuable figure, information on the breakdown of emissions from local government operations by sources and sectors allows the comparative analysis and insight needed for effective decision-making on target setting, developing GHG reduction measures, or monitoring. Details on the breakdown of Oceanside's emissions by sources and sectors can be found in the subsequent sections of this report.

Buildings and Other Facilities

Of the six sectors in the municipal inventory, Buildings and Facilities represents the second largest GHG-emitting sector at 3,719 $MTCO_2$e (14.9 percent) (see Figure 1 and Table 1 in the Executive Summary). Facility operations contribute to GHG emissions through the consumption of electricity and fuels such as natural gas. Table 8 shows that electricity consumption from Oceanside buildings and facilities accounted for 2,773 $MTCO_2$e (11.1 percent of total $MTCO_2$e) and natural gas consumption from Oceanside buildings and facilities contributed another 945 $MTCO_2$e (3.8 percent of total $MTCO_2$e).

For the purposes of this inventory, facilities were grouped into 13 categories (see Figure 3 and Table 7). In 2013, the City offices and Parks and Recreation buildings were the two largest single-building contributors to emissions, accounting for 1,088 metric tons (29 percent) and 813 $MTCO_2$e (22 percent) of the total Buildings and Facilities total $MTCO_2$e.

Figure 3: City Buildings and Other Facilities Emissions by Department

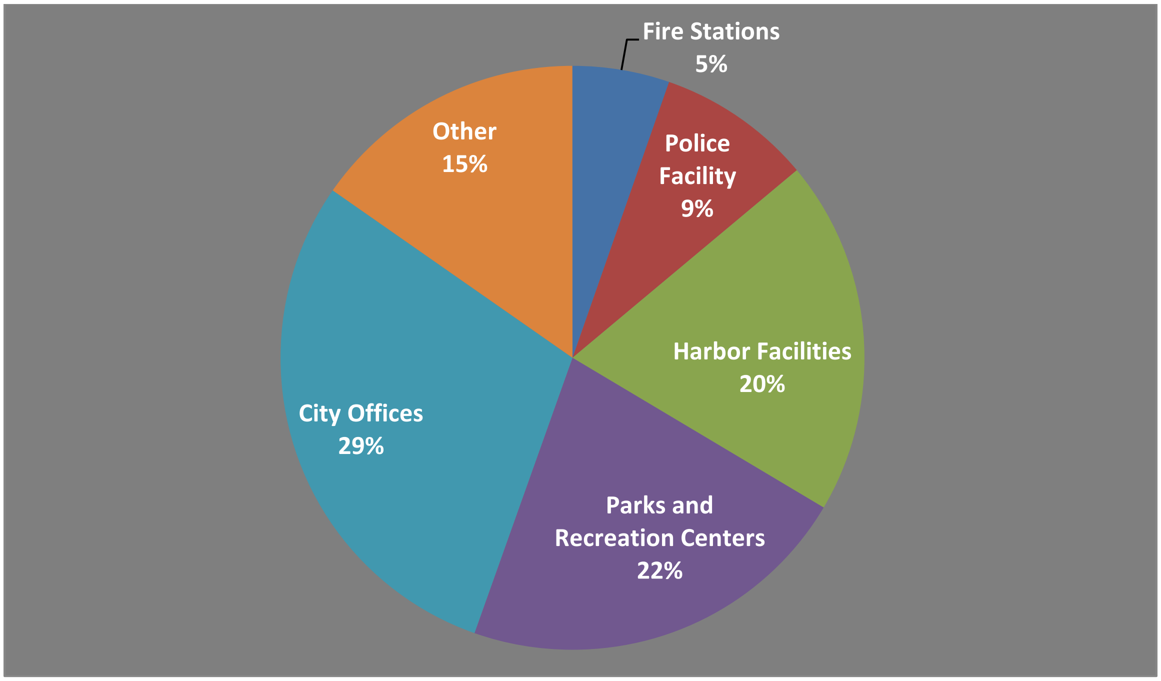


Table 7: City Buildings and Other Facilities Emissions by Department

Department	metric tons CO_2e
City Offices	1,088
Parks and Recreation Centers	813
Harbor Facilities	730
Police Facility	318
Miscellaneous Facilities	266
Fire Stations	200
Libraries	87
Parking	72
Museums	55
Neighborhood Services	34
IT Facilities	31
Public Works	18
Solid Waste Facilities	6
Totals	**3,718**

Table 8: City Buildings and Other Facilities Emissions by Source

Source	metric tons CO_2e	Percentage
Electricity	2,773	75%
Natural Gas	945	25%
Totals	**3,718**	**100%**

Figure 4: Emission Contributions from Buildings by Department and Source

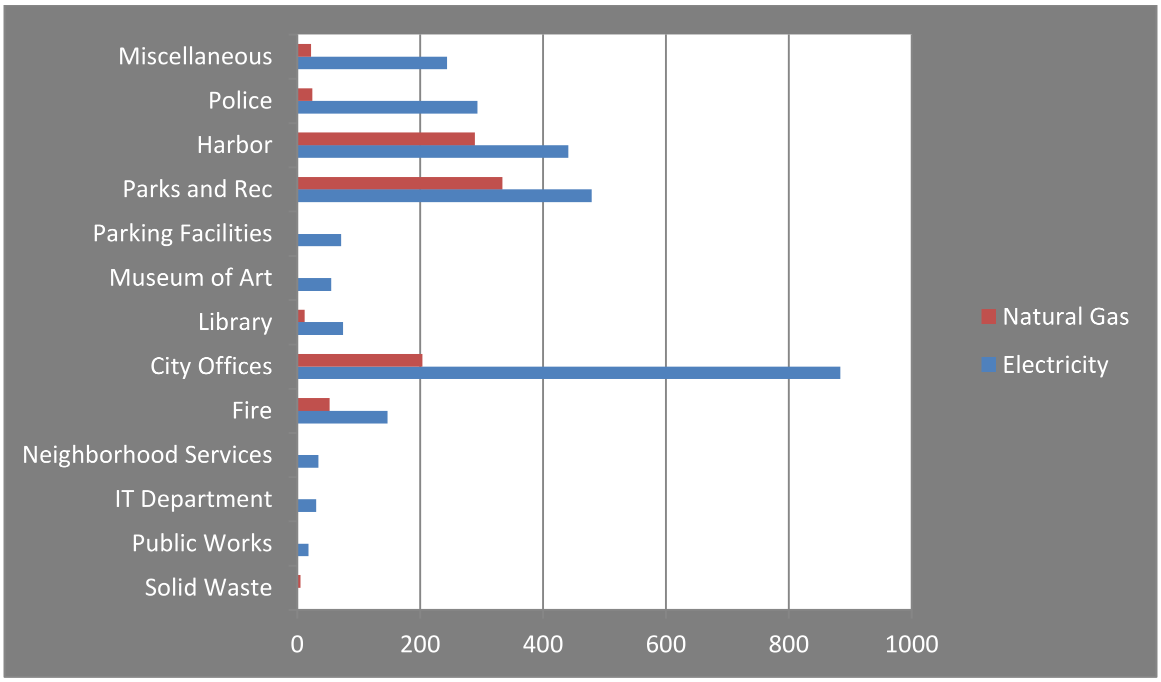


Table 9: Top 5 Largest Contributors to Emissions from Buildings Sector

Facility	% of Total Buildings Emissions from Electricity	% of Total Buildings Emissions from Natural Gas	CO_2e Emissions from Electricity	CO_2e Emissions from Natural Gas	Total CO_2e Emissions
City Offices	32%	22%	884	204	1,088
Parks and Recreation	17%	35%	479	334	813
Harbor	16%	31%	441	289	730
Police	11%	3%	293	25	318
Miscellaneous	8%	2%	244	22	266
Totals	**84%**	**93%**	**2,370**	**874**	**3,215**

Streetlights, Traffic Signals, and Other Public Lighting

The majority of emissions associated with the operation of this infrastructure are due to electricity consumption. Data relating to electricity consumption for public lighting was obtained from SDG&E.

In 2014, Public Lighting in the City of Oceanside ranked fifth in GHG emissions of the six sectors in the municipal inventory, (see Figure 1 and Table 1). Table 10 shows that public lighting consumed a total of 6,414,284 kilowatt hours of electricity, producing approximately 2,054 $MTCO_2e$ (8.3 percent). Streetlights consumed approximately 91 percent of the electricity and traffic signals and controllers accounted for nine percent.

Figure 5: Public Lighting Emissions by Subsector

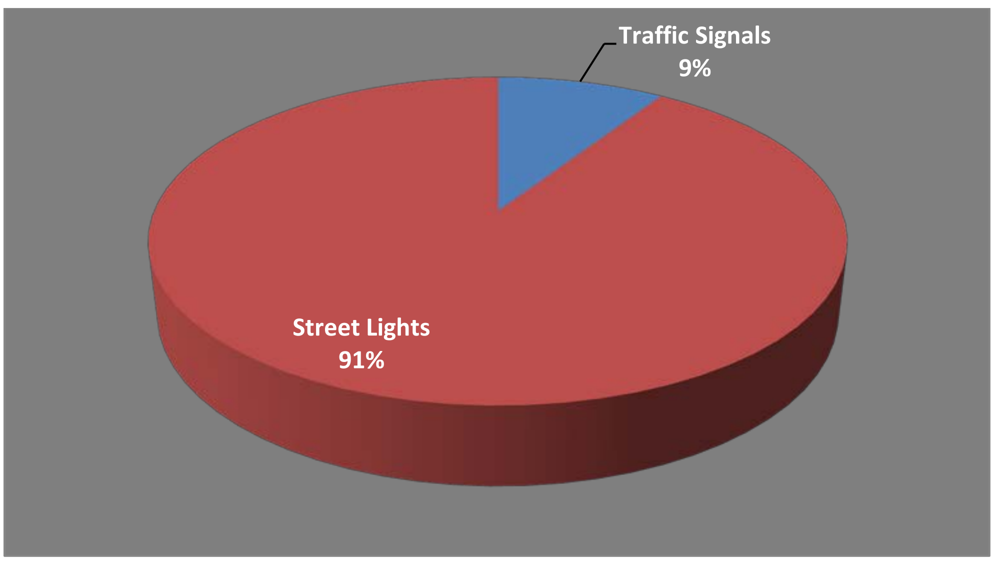


Table 10: Public Lighting Emissions by Subsector

Subsector (Light Type)	metric tons CO_2e	% of Sector Emissions	Electricity Use (kWh)
Traffic Signals/ Controllers	189	9%	591,214
Streetlights	1,865	91%	5,823,070
Totals	**2,054**	**100%**	**6,414,284**

Water and Wastewater Treatment

Of the six sectors in the municipal inventory, water transport and wastewater treatment ranks first, accounting for 12,313 (49.6 percent) $MTCO_2e$ (see Figure 1 and Table 1). This sector includes emissions from equipment used for the distribution or transport of water and sewer discharges, including drinking water, sprinkler systems and irrigation and process emissions from the La Salina and San Luis Rey wastewater treatment facilities located in the City of Oceanside. The most significant source of GHG emissions in this sector is the electricity usage at both of the wastewater treatment plants, totaling 7,156 $MTCO_2e$ in 2014. N_2O emissions from the aerobic processes of both wastewater treatment plants accounted for the second largest source in this sector, totaling 3,835 $MTCO_2e$ (31 percent).

Figure 6: Water and Wastewater Treatment Emissions by Source

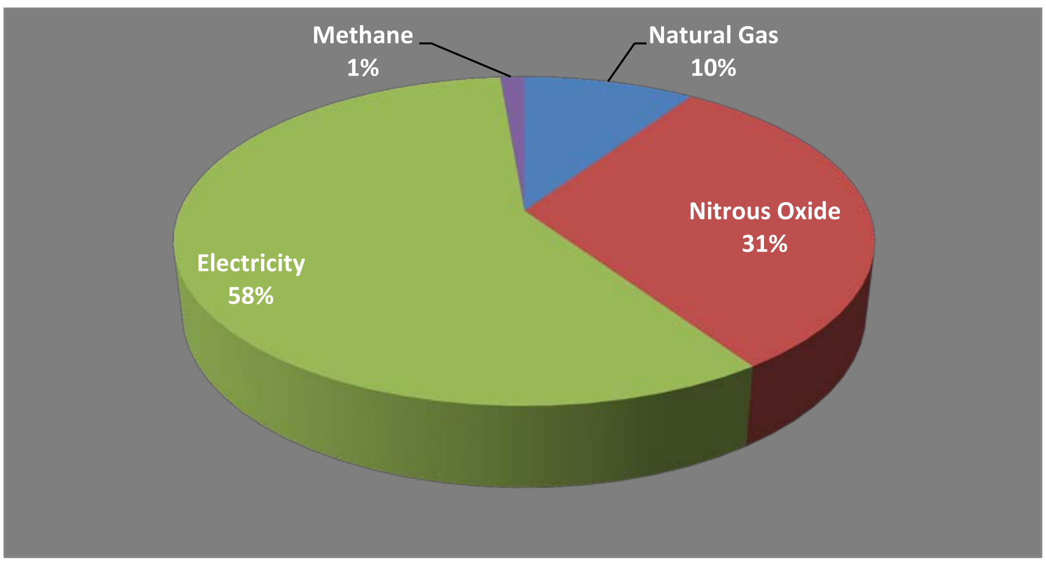


Table 11: Water and Wastewater Treatment Emissions by Source

Sources	metric tons CO_2e	% of Sector Emissions
Municipal Consumption of Grid Electricity from Sewer and Water Department	7,156	58%
Municipal Consumption of Natural Gas from Sewer and Water Department	1,158	9%
CH_4 Emissions from Anaerobic Digesters	164	1.3%
Process N_2O Emissions from Aerobic Processes	3,835	31.7%
Totals	**12,313**	**100%**

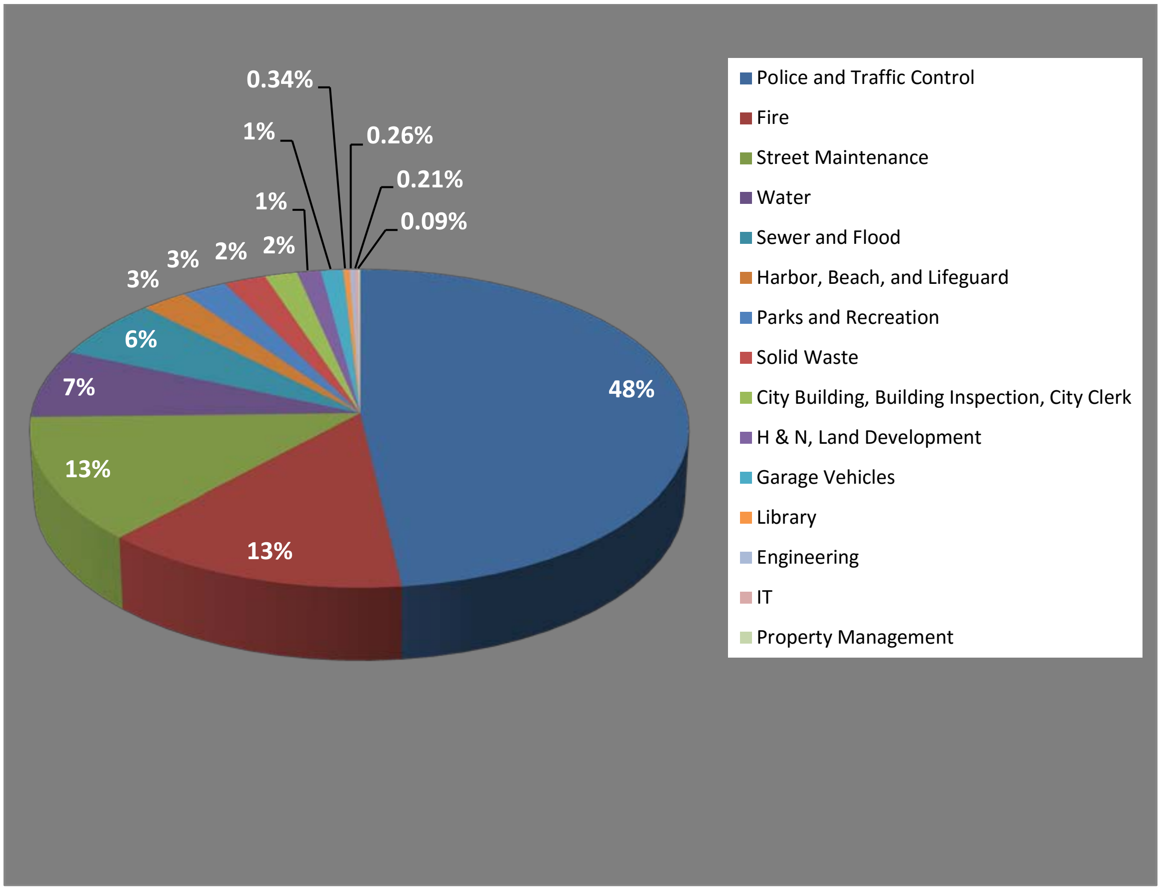
Vehicle Fleet

Of the six sectors in the municipal inventory, vehicle fleet ranks third, accounting for 3,066 $MTCO_2e$ (12.3 percent) (see Figure 1 and Table 1). The vehicles used in the City of Oceanside's daily operations, including maintenance trucks used for parks and recreation to police cruisers and fire trucks, burn gasoline and diesel, which results in GHG emissions. The most significant source of GHG emissions was from Police Department vehicles, which accounted for 1,476 $MTCO_2e$ (48 percent) in 2013.

Table 12: Top 5 Vehicle Fleet Emissions Contributors by Department

Sources	metric tons CO_2e	% of Sector Emissions	Annual Unleaded Fuel Use (gallons)	Annual Diesel Fuel Use (gallons)
Police Department and Traffic Control	1,476	48%	166,411	1,413
Fire Department	421	14%	10,842	31,945
Street Maintenance	389	13%	10,194	28,963
Water Department	213	7%	19,080	4,487
Sewer and Flood Department	187	6%	8,576	10,987
Totals	**2,686**	**88%**	**215,103**	**77,795**

Figure 7: Vehicle Fleet Emissions by Department



Government-Generated Solid Waste

Of the six sectors in the municipal inventory, solid waste ranks sixth, accounting for 882 $MTCO_2e$ (3.5 percent) (see Figure 1 and Table 1). The data collected for this inventory is based on the number of times the City of Oceanside's municipal trash dumpsters were serviced by Waste Management in 2013 at all City Facilities, no matter how full. Therefore the data is in total yards serviced in 2013, and does not necessarily represent actual waste generated in the bin, due to the inability to audit the actual amount of material within bin at time of servicing.

Additionally, it is noted that in 2014, City staff conducted a field audit of all city services, and found that the majority of the 2013 service data was inaccurate, and unfortunately reflected a significant amount of trash service than what was actually being provided at City Facilities.

Since this time, the City of Oceanside has removed a significant amount of trash service, and increased recycling by over 50%.

Table 13: Government Waste Emissions by Scope and Emission Type

Scope	Emission Type	Greenhouse Gas Emissions (metric tons)	
SCOPE 3		CO_2e	CH_4
	Trash	882	35
INDICATORS	Yards of solid waste	51,324	

Employee Commute

Of the six sectors in the municipal inventory, employee commute ranks fourth, accounting for 2,793 $MTCO_2e$ (11.2 percent) (see Figure 1 and Table 1). Emissions in the Employee Commute sector are due to combustion of fuels in vehicles used by the City of Oceanside's employees for commuting to work. Results from a survey designed by ICLEI and administered by the City of Oceanside was used to collect the data needed to calculate emissions, with 200 employee survey responses.

Table 14: Employee Commute Emissions by Source and Emission Type

Emission Type	Greenhouse Gas Emissions (metric tons)			
	CO_2e	CO_2	CH_4	N_2O
Gasoline	2,668	2,587	0.198	0.255
Diesel	125	125	0.0001	0.0003
TOTAL	**2,793**	**2,712**	**0.199**	**0.258**
Vehicle Miles Traveled*	6,106,212			

Conclusion

By updating its GHG inventories, the City of Oceanside continues to take important steps towards reducing its environmental impacts and promoting a sustainable future. Tracking emissions can illustrate areas where the City can further reduce GHGs caused by its municipal operations and highlight sectors that could use programs or policy measures to help meet state and local climate goals.

C Oceanside Climate Action Plan Technical Methods

Oceanside Climate Action Plan Technical Methods

April 2019~~August 2018~~

Prepared for:

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CONTENTS

Tables

Attachments

Chapter 1 Introduction

While preparing the Climate Action Plan (CAP), RECON Environmental, Inc. has made minor refinements to the previous City of Oceanside inventory reports, forecasted future emissions under multiple scenarios, identified emissions reductions associated with a list of recommended sustainability measures, and identified a project review checklist for determining the consistency of future development projects with CAP assumptions. The intent of this technical appendix is to provide a more thorough discussion of the sources of data used, as well as the approach used to develop the greenhouse gas (GHG) emission forecasts. All GHG emissions forecasts are reported in terms of total metric tons (MT) of carbon dioxide equivalent (CO_2e).

Chapter 2 **Emissions Inventory**

Detailed greenhouse gas inventories incorporated into the CAP included the April 2016 *Draft City of Oceanside Greenhouse Gas Inventory and Forecast*, which assessed communitywide emission sources within the City in 2013 and the February 2016 *Draft 2013 Local Government Operations Greenhouse Gas Emissions Inventory*, which assessed municipal emissions (municipal emissions are a subset of communitywide emissions). These inventories were prepared by the Energy Policy Initiatives Center (EPIC) of the University of San Diego and the CivicSpark Americorps Program and are included in Appendix A and Appendix B of the CAP. Previous inventories, as well as the inventory as refined by RECON were prepared using the Statewide Energy Efficiency Collaborative (SEEC) Clearpath Model. This section details and explains the differences in the emissions inventory resulting from use of the SEEC Clearpath Model for preparation of the CAP.

The Local Government Operations Protocol (LGO Protocol) and the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol) are standardized sets of guidelines to assist local governments in developing municipal and community GHG inventories. The LGO Protocol and was developed in partnership by the California Air Resources Board, California Climate Action Registry, ICLEI – Local Governments for Sustainability, and The Climate Registry. The Community Protocol was developed by ICLEI – Local Governments for Sustainability. The previous inventory reports were reviewed and determined to be consistent with the LGO and Community protocols. Additionally, all emission factors were reviewed and were generally determined to be up-to-date and applicable to the City. As the previous inventory data sources, emission factors, and methodology were accurate and consistent with relevant guidance, the refined inventory was generally prepared using the same data and methodology from the previous inventories. For discussion of inventory data and methodology see CAP Appendix A and Appendix B.

The differences between results of the previous inventories and refined inventory were minor. **Table 1** below summarizes the difference between the previous communitywide inventory and the refined communitywide inventory; a breakout of municipal and non-municipal emissions is provided for the refined inventory. Refinements in methodology that resulted in these differences are discussed below. As municipal emissions are a subset of the communitywide emissions, the refinements in methodology to the communitywide inventory were also applied to the municipal inventory. The municipal inventory and forecast is not discussed further.

Table 1 Comparison of GHG Emissions by Inventories (2013)

Source	Activity	Emissions (MT CO_2e)	
		Previous	Refined
Transportation	1,014,833,210 VMT	483,099	483,037
Non-Municipal		-	*477,178*
Municipal		-	*5,859*
Electricity	675,419,693 kWh	260,631	260,899
Non-Municipal		-	*251,524*
Municipal		-	*9,375*
Natural Gas	3,072,959 MMBtu	168,164	163,392
Non-Municipal		-	*162,447*
Municipal		-	*945*
Solid Waste	120,718 tons	41,483	41,497
Non-Municipal		-	*40,615*
Municipal		-	*882*
Water	18,736 Million Gallons	31,188	35,187
Non-Municipal		-	*27,420*
Municipal		-	*7,767*
Total	-	988,316	984,012
Non-Municipal		-	*959,184*
Municipal		-	*24,828*

As shown in Table 1, emissions differences within each emission sector, i.e. transportation, electricity, solid waste, and water, are all less than 0.1 percent and can generally be attributed primarily to rounding differences.

The difference in estimated transportation emissions is attributable to a revision in the inventoried vehicle miles traveled (VMT). The EPIC inventory report linearly interpolated annual vehicle miles traveled in 2013 from San Diego Association of Governments (SANDAG) Series 13 Forecast 2012 and 2014 forecasts. For consistency with SEEC Clearpath Model growth factors, the annual VMT in 2013 was interpolated based on exponential regression (constant percent reduction). This difference in methodology reduced the estimated annual VMT in 2013 from 1,014,833,210 to 1,014,833,210, a difference of approximately 0.01 percent.

The difference in estimated natural gas emissions is attributable to the emission factor used in the different methodologies. The EPIC inventory report was based on an emission factor of 0.0055 MT CO_2e/therm, which is based on 2014 California Greenhouse Gas Inventory emission factors. The emission factor used in the SEEC Clearpath Model is 0.0053 MT CO_2e/therm, which is based on Method BE.1 and associated emission factors from the Community Protocol. This difference in emissions factors reduced the reported GHG emissions from natural gas by approximately three percent.

Similarly, the difference in estimated water emissions is attributable to a difference in in the EPIC inventory methodology and the methodology employed in refined inventory. The EPIC inventory report was modified to exclude emissions associated with wastewater inflow from the Rainbow Municipal Water District and the City of Vista to the San Luis Rey Wastewater Treatment Plan. The refined inventory reported the emissions for treatment of this wastewater because the San Luis Rey Wastewater Treatment Plant is operated by the City and thus is included within the municipal inventory. This increase in the estimated wastewater emissions results in an associated increase in GHG emissions by approximately seven percent.

Differences between the EPIC communitywide inventory and the refined communitywide inventory result in an approximate 0.4 percent reduction in total estimated communitywide emissions.

Chapter 3 Communitywide Emissions Forecast

As discussed in the CAP, communitywide GHG emissions were initially forecasted under two conditions: a Business-as-Usual (BAU) condition and an “Adjusted” Business-as-Usual (Adjusted BAU) condition. The BAU condition describes emissions based on projected growth in population, employment, and automotive use and does not consider policies that will reduce emissions in the future (i.e., the policies and related efficiency levels in place in 2013 are assumed to remain constant through 2035). The Adjusted BAU condition describes emissions based on projected growth and considers state programs that will achieve GHG reductions in the future.

Forecasts were modeled in the SEEC Clearpath Model, which uses 5-year increment growth and emission factors (factor sets). Basic growth indicators included forecasted population, VMT, commercial jobs, industrial jobs, and municipal jobs. Emission factor indicators were developed for vehicle emission factors and electricity intensity factors to reflect the effects of California’s Advanced Clean Cars Program and Renewable Portfolio Standard (RPS). For example, on-road transportation emissions in 2015 were calculated based on 2013 baseline levels, a 1.510 percent annual growth rate for VMT, and a -2.515 annual decay rate for vehicle emission rates; on-road transportation emission in 2020 were further forecast based on 2015 forecasted levels, a 0.272 percent annual growth rate for VMT, and a -2.515 annual decay rate for vehicle emission rates; and so forth.

Table 2 below summarizes the growth indicators used in the CAP emission forecasts for each sector/source. **Tables 3–6** summarize the sources used to develop growth forecasts and emission factor sets are discussed and shown below. Additionally, original sources are included in Attachment 1. **Tables 7** and **8** summarize the development of growth and emission factor sets. The BAU and Adjusted BAU forecasts for each year are shown in **Table 9**.

Forecasted population growth was based on the San Diego Association of Governments’ (SANDAG) Series 13 Regional Growth Forecast for the City of Oceanside as shown in Table 3. As shown, the Regional Growth Forecast identified population estimates for 2012, 2020, 2035, and 2050. The population for intermediate years was interpolated assuming a steady growth rate for each interval (for example approximately 0.62 percent growth per year from 2012–2020).

Forecasted VMT was based on a SANDAG Series 13 Forecast for regional VMT by jurisdiction as shown in Table 4. All VMT associated with trips with an origin and destination within the City was included; half of the VMT associated with trips with an origin or destination outside the City was included; pass-through trips were excluded. As shown, the Regional Growth Forecast identified VMT estimates for 2012, 2014, 2015, 2020, and 2035. The VMT for intermediate years was interpolated assuming a steady growth rate for each interval; the VMT for years after 2035 was estimated assuming the growth rate for the 2020–2035 interval would continue.

Forecasted employment was based on projections developed by Keyser Marston Associates as shown below. Commercial jobs were assumed to include all employment from the commercial office and commercial retail sectors as well as the education services subsector, the arts entertainment and recreation subsector, and the other services subsector. Industrial jobs were assumed to include all employment from the industrial sector. Municipal jobs were assumed to include all employment from the institutional public administration subsector. As shown, the employment projections identified employment estimates for 2009, 2014, and 2035. The employment for intermediate years was interpolated assuming a steady growth rate for each interval; the employment for years after 2035 was estimated assuming the growth rate for the 2014–2035 interval would continue.

Vehicle emission factors sets were derived from the California Air Resource Board's (California ARB) motor vehicle emission inventory program, EMFAC2014 and are shown in Table 6. Specific runs were input for the San Diego Subarea of the San Diego Air Basin for the years 2013, 2020, 2030, 2040, and 2050. The decay rate for the overall CO_2E per mile was determined for each model year and was entered in the factor set.

Electricity intensity factors sets were derived from the based on the 11.9 percent reported 2010 RPS procurement from the 2016 Biennial RPS Program Update and the minimum RPS mandated energy mix of 33 percent renewables by 2020 and 50 percent renewables by 2030 (California Public Utilities Commission 2016). The intensity factors for intermediate years was interpolated assuming a steady growth rate for each interval. No additional reduction in electricity intensity factors was forecast beyond 2030.

Forecasted energy use was modified to account for the effects of California Code of Regulations, Title 24, Part 6 – Energy Efficiency Standards (Energy Code), which establishes energy-efficiency standards for residential and non-residential buildings in order to reduce California's energy consumption. The 2016 Energy Code became effective January 1, 2017 and will be effective until it is replaced by the 2019 Energy Code, which becomes effective on January 1, 2020. The California Energy Commission (CEC) Impact Analysis for the 2016 Energy Code concludes that the 2016 Energy Code results in an 11.7 percent reduction in electricity demand and a 21.1 percent reduction in natural gas use from newly constructed single-family homes (CEC 2015). Additionally, the 2016 Energy Code results in a 4.6 percent reduction in electricity demand and a 0.5 percent reduction in natural gas use from newly constructed non-residential buildings (CEC 2015). Thus, residential energy use growth from 2017 to 2019 was reduced accordingly.

Based on CEC estimates, the 2019 Energy Code will further reduce energy use from new residences by an additional 53 percent (CEC 2018). Thus, residential energy use growth for 2020 and beyond was reduced by an additional 53 percent. Estimates of additional non-residential energy use reductions have not been released, thus the reduction from the 2016 Energy Code was carried forward for 2020 and beyond.

Table 2 Growth Indicators and Emission Factor Sets

Sector/Source	Growth Indicator	Factor Sets
Residential Electricity	Population	California RPS Mandate
Residential Natural Gas	Population	No Growth
Commercial Electricity	Commercial Jobs	California RPS Mandate
Commercial Natural Gas	Commercial Jobs	No Growth
Industrial Electricity	Industrial Jobs	California RPS Mandate
Industrial Natural Gas	Industrial Jobs	No Growth
Transportation	Vehicle Miles Traveled	EMFAC Vehicle Emission Factors
Solid Waste	Population	No Growth
Water Supply Energy	Population	California RPS Mandate
Wastewater Process Emissions	Population	No Growth
Municipal Buildings & Facilities Electricity	Municipal Jobs	California RPS Mandate
Municipal Buildings & Facilities Natural Gas	Municipal Jobs	No Growth
Municipal Street Lights	Population	California RPS Mandate
Municipal Vehicle Fleet	Municipal Jobs	EMFAC Vehicle Emission Factors
Municipal Employee Commute	Municipal Jobs	EMFAC Vehicle Emission Factors
Municipal Solid Waste Facilities	Municipal Jobs	No Growth
Municipal Water Supply Energy	Population	California RPS Mandate
Municipal Wastewater Process Emissions	Population	No Growth

Table 3 SANDAG Series 13 Regional Growth Forecast, City of Oceanside

Forecasted Metric	2012	2020	2035	2050
Population and Housing				
Total Population	169,319	177,840	188,597	189,377
Total Housing Units	65,469	67,817	70,395	70,942
Single Family	42,196	42,996	43,363	43,709
Multiple Family	19,761	21,518	23,729	23,934
Mobile Homes	3,512	3,303	3,303	3,299
Persons per Household	2.80	2.86	2.87	2.86

Table 4 SANDAG VMT Projections

Oceanside Total	2012	2013	2014	2015	2020	2035
Total "Clipped" Vehicle Miles Traveled (VMT) within City boundaries, (miles/weekday)	2,845,391	-	2,927,580	2,956,856	3,103,945	3,403,004
Internal Origin - Internal Destination (I-I) Trips (miles/weekday)	616,005	-	646,351	652,815	663,798	731,385
External Origin or Destination (I-E or E-I) Trips (miles/weekday)	4,466,226	-	4,593,915	4,654,641	4,714,048	5,103,996
Pass-through (E-E) Trips (miles/weekday)	970,667	-	990,917	1,000,826	1,105,120	1,198,973
Total VMT (100% I-I, 50% I-E, 50% E-I) (miles/weekday)	2,849,118	-	2,943,309	2,980,135	3,020,822	3,283,383
Total VMT (100% I-I, 50% I-E, 50% E-I) (miles/year)*	998,330,995	1,014,698,962	1,031,335,287	1,044,239,566	1,058,495,996	1,150,497,401

Notes
1. Weekday VMT (miles/weekday) were multiplied by 0.96 to adjust from average weekday to average daily (accounts for lower weekend VMT), and converted to annual VMT (miles/year) by multiplying by 365.
2. Total 2013 VMT was interpolated and used in modeling (shown in light grey fill)

Table 5 KMA Employment Projections

Employment Sector	Number of Employees		
	2009	**2014**	**2035**
Commercial			
Office			
Information	454	465	705
Finance and Insurance	508	624	1,161
Real Estate and Rental, and Leasing	674	790	1,470
Professional, Scientific, and Technical Services	3,192	1,745	2,645
Management of Companies and Enterprises	305	314	476
Administration & Support, Waste Management and Remediation	2,384	2,401	3,639
Health Care and Social Assistance	4,992	6,111	13,926
Retail			
Wholesale Trade	1,779	1,702	2,580
Retail Trade	4,918	5,506	9,248
Accommodation and Food Services	4,729	5,082	9,454
Industrial			
Mining, Quarrying, and Oil and Gas Extraction	1	0	0
Utilities	172	152	230
Construction	1,719	1,532	1,888
Manufacturing	2,199	3,781	8,616
Transportation and Warehousing	701	885	1,646
Agriculture, Open Space, and Institutional			
Agriculture, Forestry, Fishing, and Hunting	1,077	731	901
Education Services	5,287	2,373	2,924
Arts, Entertainment, and Recreation	971	932	1,149
Public Administration	861	835	1,266
Other			
Other Services (excluding Public Administration)	1,895	1,491	2,260
Total	38,818	37,452	66,182

Table 6 Vehicle Emission Factor Set

Forecasted Metric	2013	2020	2030	2040	2050
San Diego County Emission Factors					
Total Daily Vehicle Miles Traveled	72,341,078	82,315,741	89,623,697	95,616,887	100,696,455
Total Daily CO_2 Emissions (tons)	38,972	37,128	29,197	27,954	29,374
Total Daily CH_4 Emissions (tons)	2.85	1.87	1.37	1.32	1.36
Total Daily NO_x Emissions (tons)	60.23	31.94	16.32	14.53	15.24
Aggregate Emission Factor (kg CO_2e/mile)	0.490	0.410	0.296	0.266	0.265

Table 7 Growth Indicators – Calculated Factor Sets

Year	Population	Population Growth Rate	Population Factor Set	VMT	VMT Growth Rate	VMT Factor Set	Commercial Employment	Commercial Employment Growth Rate	Commercial Employment Factor Set
2009	-	-	-	-	-	-	**32,088**		-1.644%
2010	-	-		-	-		31,561		
2011	-	-		-	-		31,042	-1.644%	
2012	**169,319**		0.616%	-	-	1.510%	30,531		-0.791%
2013	170,361			**1,014,698,962**	1.510%		30,030		
2014	171,410			1,031,335,287			**29,536**		
2015	172,465	0.616%		**1,044,239,566**			30,332		
2016	173,527			1,047,075,408			31,150		
2017	174,595		0.616%	1,049,918,950	0.272%	0.272%	31,990		2.696%
2018	175,670			1,052,770,215			32,852		
2019	176,752			1,055,629,224			33,738		
2020	**177,840**			**1,058,495,996**			34,647		
2021	178,538			1,064,393,747			35,581		
2022	179,238		0.392%	1,070,324,358		0.557%	36,540		2.696%
2023	179,941			1,076,288,015			37,526		
2024	180,647			1,082,284,899			38,537		
2025	181,356			1,088,315,197			39,576		
2026	182,067			1,094,379,095			40,643		
2027	182,781		0.392%	1,100,476,780		0.557%	41,739		2.696%
2028	183,498			1,106,608,440			42,864		
2029	184,218			1,112,774,264			44,019		
2030	184,941			1,118,974,444			45,206		
2031	185,666			1,125,209,169			46,425		
2032	186,395		0.392%	1,131,478,634		0.557%	47,676	2.696%	2.696%
2033	187,126			1,137,783,031			48,962		
2034	187,860			1,144,122,555			50,281		
2035	**188,597**	0.392%		**1,150,497,401**	0.557%		**51,637**		
2036	188,649			1,156,907,767			53,029		
2037	188,701		0.392%	1,163,353,850		0.557%	54,459		2.696%
2038	188,753			1,169,835,850			55,927		
2039	188,805			1,176,353,967			57,434		
2040	188,857			1,182,908,401			58,983		
2041	188,909			1,189,499,355			60,573		
2042	188,961		0.392%	1,196,127,033		0.557%	62,206		2.696%
2043	189,013			1,202,791,639			63,883		
2044	189,065			1,209,493,379			65,605		
2045	189,117			1,216,232,460			67,374		
2046	189,169			1,223,009,090			69,190		
2047	189,221		0.392%	1,229,823,478		0.557%	71,055		2.696%
2048	189,273			1,236,675,835			72,971		
2049	189,325			1,243,566,372			74,938		
2050	**189,377**		-	1,250,495,302		-	76,958		-

Bolded quantities are direct from original forecast.

Table 7 Growth Indicators – Calculated Factor Sets (Cont.)

Year	Industrial Employment	Industrial Employment Growth Rate	Industrial Employment Factor Set	Municipal Employment	Municipal Employment Growth Rate	Municipal Employment Factor Set
2009	**4,792**		-	**861**		
2010	5,070			856		
2011	5,363	5.792%		851	-0.611%	
2012	5,674		5.274%	845		-0.094%
2013	6,002			840		
2014	**6,350**			**835**		
2015	6,555			852		
2016	6,767			869		
2017	6,985		3.230%	886		2.002%
2018	7,211			904		
2019	7,444			922		
2020	7,685			940		
2021	7,933			959		
2022	8,189		3.230%	978		2.002%
2023	8,454			998		
2024	8,727			1,018		
2025	9,008			1,038		
2026	9,299			1,059		
2027	9,600		3.230%	1,080		2.002%
2028	9,910			1,102		
2029	10,230			1,124		
2030	10,561			1,147		
2031	10,902			1,170		
2032	11,254	3.230%	3.230%	1,193	2.002%	2.002%
2033	11,617			1,217		
2034	11,993			1,241		
2035	**12,380**			**1,266**		
2036	12,780			1,291		
2037	13,193		3.230%	1,317		2.002%
2038	13,619			1,344		
2039	14,059			1,370		
2040	14,513			1,398		
2041	14,982			1,426		
2042	15,466		3.230%	1,454		2.002%
2043	15,965			1,484		
2044	16,481			1,513		
2045	17,013			1,543		
2046	17,563			1,574		
2047	18,130		3.230%	1,606		2.002%
2048	18,716			1,638		
2049	19,321			1,671		
2050	19,945		-	1,704		-

Bolded quantities are direct from original forecast.

Table 8 Emissions Factor Sets – Calculated Factor Sets

Year	Renewable Energy Procurement	Electricity Factor Decay Rate	Electricity Factor Set	Vehicle Emission (kg CO_2E/mile)	Vehicle Emission Decay Rate	Vehicle Emission Factor Set
2010	**11.9% / 88.1%**	-2.701%	-2.701%	-	-	-2.515%
2011	14.3% / 85.7%			-	-	
2012	16.6% / 83.4%			-	-	
2013	18.8% / 81.2%			**0.490**	-2.515%	
2014	21.0% / 79.0%			0.477		
2015	23.2% / 76.8%		-2.701%	0.465		-2.515%
2016	25.2% / 74.8%			0.454		
2017	27.3% / 72.7%			0.442		
2018	29.2% / 70.8%			0.431		
2019	31.1% / 68.9%			0.420		
2020	**33.0% / 67.0%**	-2.884%	-2.884%	**0.410**	-3.202%	-3.202%
2021	34.9% / 65.1%			0.397		
2022	36.8% / 63.2%			0.384		
2023	38.6% / 61.4%			0.372		
2024	40.4% / 59.6%			0.360		
2025	42.1% / 57.9%		-2.884%	0.348		-3.202%
2026	43.8% / 56.2%			0.337		
2027	45.4% / 54.6%			0.326		
2028	47.0% / 53.0%			0.316		
2029	48.5% / 51.5%			0.306		
2030	**50.0% / 50.0%**	0%	0%	**0.296**	-1.077%	-1.077%
2031	50.0% / 50.0%			0.293		
2032	50.0% / 50.0%			0.290		
2033	50.0% / 50.0%			0.286		
2034	50.0% / 50.0%			0.283		
2035	50.0% / 50.0%		0%	0.280		-1.077%
2036	50.0% / 50.0%			0.277		
2037	50.0% / 50.0%			0.274		
2038	50.0% / 50.0%			0.271		
2039	50.0% / 50.0%			0.268		
2040	50.0% / 50.0%		0%	**0.266**	-0.022%	-0.022%
2041	50.0% / 50.0%			0.266		
2042	50.0% / 50.0%			0.265		
2043	50.0% / 50.0%			0.265		
2044	50.0% / 50.0%			0.265		
2045	50.0% / 50.0%		0%	0.265		-0.022%
2046	50.0% / 50.0%			0.265		
2047	50.0% / 50.0%			0.265		
2048	50.0% / 50.0%			0.265		
2049	50.0% / 50.0%			0.265		
2050	50.0% / 50.0%		-	**0.265**		-

Bolded quantities are direct from original forecast.

Table 9 Community Emission Forecasts

Sector	Emissions (MT CO_2e)					
	2013	2020	2030	2035	2040	2050
Business-As-Usual Forecast						
Residential Energy	222,963	229,668	238,839	242,675	243,009	243,611
Commercial Energy	159,370	185,470	241,992	276,417	315,739	401,146
Industrial Energy	41,957	53,453	73,459	86,116	100,953	134,395
Transportation	483,037	499,795	528,352	543,237	558,541	587,184
Solid Waste	41,498	42,614	44,131	44,757	44,348	44,458
Water & Wastewater	35,187	36,245	37,693	38,298	38,351	38,446
Total	**984,012**	**1,047,245**	**1,164,466**	**1,231,500**	**1,300,941**	**1,449,240**
Adjusted Business-As-Usual Forecast						
Residential Energy	222,963	207,587	187,422	188,533	188,624	188,789
Commercial Energy	159,370	162,721	179,404	204,180	232,209	293,089
Industrial Energy	41,957	45,345	49,922	58,193	67,743	89,268
Transportation	483,037	415,229	323,975	315,553	310,627	325,907
Solid Waste	41,498	42,614	44,131	44,757	44,348	44,458
Water & Wastewater	35,187	30,592	25,439	25,848	25,883	25,947
Total	**984,012**	**904,088**	**810,293**	**837,064**	**869,434**	**967,458**

Chapter 4 Reduction Measures

Energy Related Measures

Assumptions used in calculating GHG reductions related to electric, natural gas, and energy measures, including federal and State actions are described herein. The emissions factor for electricity is the amount of GHGs in each unit of electricity is supplied to residents and businesses within the City. The electricity emission factor is used in different ways throughout the CAP, such as calculating the emissions associated with electricity production emissions inventories and estimating the effect of various (MWh) GHG reduction measures in the CAP. As example, the amount of GHG emissions per megawatt-hour delivered is reduced as the energy comes from more renewable sources. Accordingly, the related emission reductions are reduced from increased energy efficiency as more renewables are included in the energy mix. For modeling purposes, the electricity emissions factor is measured in in units of pounds of CO_2e per MWh (lbs. CO_2e/MWh). The CAP uses electricity emissions factors based on energy supplied to San Diego Gas & Electric (SDG&E), a model community-choice-energy program or similar program, and considers effects of California's solar programs. Each energy supply has its own renewable content, which changes the emissions factor used in different scenarios.

The following sections describe the method used to determine the emission factor for the different forms of energy supply. The 2013 inventory emissions factor was developed in a similar way and provided by EPIC. The BAU and Adjusted BAU (ABAU) incorporate state level actions such as RPS and California Building Code requirements. The CAP scenario calculations incorporate reductions due to Community Choice Energy (CCE), solar photovoltaic (PV), and other sources the City can affect.

Based on the requirements of the State's RPS, as the percentage of renewable energy increases, the amount of non-renewable GHG emissions decrease. Thus, the overall average energy emissions factor used in the CAP decreases throughout the planning period.

San Diego Gas & Electric

The emissions factor for SDG&E includes the emissions from SDG&E owned power plants and from power purchased by SDG&E. SDG&E energy emissions factors were developed based on required reporting under California's RPS and the EPIC 2013 emissions inventory.

Community Choice Energy Programs

The CAP includes a goal to achieve a 75 percent renewable electricity supply in the City. The CAP includes measure E1–Renewable Energy Procurement, which includes the formation of a CCE or similar program to achieve the renewable electricity supply goal. Under a CCE style program, the City would enable the alternative supply of electricity residents and businesses within the City. A CCE essentially is an alternative supplier of electric energy that would use the existing distribution and transmission system to supply the electricity. For evaluating scenarios, the CAP assumes that 10 percent of all eligible customers participate in a CCE or another program each year. The CAP also assumes the electricity supply from a CCE or another program is 75 percent renewable by 2030 through a combination of renewable energy contracts and purchases. The rate of adoption is based on results of similar CCE style programs developed throughout the state, such as in Marin, Sonoma, Napa, San Francisco, San Mateo, and Los Angeles Counties. Included in all scenarios are~~,~~ the requirements of the California RPS, which sets the renewable electricity supply target to 50 percent by 2030.

In the assessment of Measure E1, the energy emissions factor is adjusted to match the quantity of renewable energy supplied by a CCE style program from a baseline emissions factor of 736.6 lbs. CO_2e/MWh from SDG&E supplied electricity. There is no effect from a CCE or similar program until after 2025 (CAP Phase 3) because a CCE style program is not likely to be fully implemented until after that date and this approach ensures speculative reductions are not taken.

During preparation of the CAP, California's RPS required all electric service providers to procure 50 percent of electricity sales from renewable sources by 2030. Therefore, depending on when a CCE is adopted the percentage of total emission reductions from achieving a 75 percent renewable supply (e.g., through CCE program) may be attributed to RPS while the remaining is attributed to local action. This is to say that the renewables mix for SDG&E in 2018 is approximately 43 percent, this is anticipated to increase to at least 50 percent by 2030. Therefore, a CCE would effectively make up the remaining 25 percent for purposes of assessing total GHG emissions.

CA Solar Programs

The CAP also considered the Solar Photovoltaic Promotion Program, Measure E-2, as part of the overall supply of electricity for the City as opposed to a demand reduction (i.e., it was deducted from the total electricity demand in the City or a "de-carbonizing" of the grid electricity). This program is recognized as a reduction in the source so it does not show emission reductions benefits for programs that would not have an effect on future emissions when the grid energy is 100 percent renewable. For purposes of estimating emissions reductions in the CAP, solar PV energy is 100 percent renewable and has no associated GHG emissions. Therefore, energy produced by solar PV systems adjusts the energy emissions factor in the near term but has no effect in the future. Including solar PV as part of the electricity supply for the City allows for the appropriate allocation of emissions reductions attributable to solar PV programs without double counting.

Emissions Factor for Electricity

To develop the overall 2013 emissions factor for electricity of 736.6 lbs. CO_2e/MWh, the weighted average of all sources of electricity were used. The 2013 energy emissions factor was weighted by the percentage of gross generation supplied by each source. Each source is also affected by the amount of renewable content associated with the source. In 2013, renewables contributions are from SDG&E and the CA Solar Programs.

The 2013 energy emissions factor for electricity supplied by SDG&E is 736.6 lbs. CO_2e/MWh. This emissions factor includes the effects of the existing RPS renewable content requirement in the electricity supplied by SDG&E in year 2013. CO_2e /MWh was adjusted down per the requirements of RPS though 2030. Since the CAP was finalized for public review, Senate Bill 100 was signed in to law and would require all electricity to be 100 percent renewable by 2045. This new law is not reflected in the 2050 ABAU or proposed CAP forecasts. A CCE would result in the City achieving 100 percent renewable energy supply earlier than mandated by the state but would not have a greater effect in reducing emissions after that point.

Energy and Buildings

- E1—Renewable Energy Procurement

Quantified

As described in the Greenhouse Gas Emissions Factor for Electricity section above, several categories of supply contribute to the goal of reaching 75 percent renewable electricity supply by 2030, including the renewable electricity supply by the utility (SDG&E), CA Solar Programs, and CCE programs. Given the assumptions included in the CAP for those categories, 75 percent of electricity supply would be renewable by 2030. This level of renewable supply allows the City to achieve a reduction of 73,685 MT CO_2e by 2030. As the CAP is reviewed and updated, the renewable electricity supply will be reviewed to determine how the City is progressing in meeting the 75 percent renewable energy goal by 2030.

To estimate the effect of policies due to a CCE or another program, it is necessary to account for the interaction among the categories of supply. The percentage of electricity and renewable content associated with CA Solar Programs, CCE style programs, and the investor-owned utility supplier are described in Attachment 2. As mentioned in the Greenhouse Gas Emissions Factor for Electricity section above, it is assumed that an additional 10 percent of citywide energy will be supplied by a CCE or similar program annually. The potential success of the measure is based on the success of similar programs around the state, such as Marin Clean Energy, Sonoma Clean Power, Clean Power SF, Monterey Bay Community Power, all of which offer 100 percent clean power options and have 75 percent or higher participation rates. To estimate the GHG reductions from Measure E1, the emission reduction rate is based on an annual average rate of enrollment. It should be noted that, former Governor Jerry Brown signed legislation to increase the renewable portfolio standard supply targets to 60 percent renewable electricity by 2030 and 100 percent by 2045; however, the CAP only includes the previous requirement to achieve a 50 percent renewable mix by 2030. Detailed calculations are included in Attachment 2.

- E2—Solar Photovoltaic Promotion Program

Quantified

The 2019 Energy Code will require that new residential projects incorporate renewable energy beginning January 1, 2020. Therefore, the residential component of an ordinance may achieve GHG emission reductions earlier than 2020 by enforcing renewable energy requirements beginning at an earlier date. However, emissions reductions estimates conservatively exclude residential and only account for the commercial- and industrial-components of this measure. Detailed calculations are included in Attachment 2.

- E3—Residential Energy Conservation and Disclosure

Not quantified

For the Residential Energy Conservation and Disclosure Ordinance, the CAP evaluated the effect of requiring residential units being sold or remodeled to disclose energy use. Additionally, it was assumed that rented units would not be captured by this measure. To calculate reductions from this measure the estimated number of residential units affected were identified by using the rate of remodels and additions and the historic rate of sales of residential units. However, due to concerns over the potential speculative nature of the reductions in GHG reductions the City included the measure in the CAP, but has not included the measure in the calculation of any reductions in GHG emissions. As the City implements this measure, there will be an effort to develop data necessary to include emission reductions attributed to this type of measure in future CAP updates.

- E4—Promotion of Low-Income Financing Programs

Not quantified

The State offers alternative financing to households with incomes below 80 percent of the area median income as part of the Single-Family Affordable Solar Housing Program and offers alternative financing for other energy efficiency upgrades as part of the Low-Income Weatherization Program. The City will promote these services and evaluate programs that would lower costs or other barriers associated with any City requirements. However, due to concerns over the potential speculative nature of the reductions in GHG reductions the City include any reductions in GHG emissions associated with this measure. As the City implements this measure, there will be an effort to develop data necessary to include emission reductions associated with this measure in future CAP updates.

- E5—Non-Residential Building Energy Benchmarking and Disclosure

Not quantified

A large portion of the existing nonresidential buildings were constructed prior to California's first adoption of the energy code standards. A time-of-sale disclosure of energy use can increase the efficiency of the City's existing commercial and industrial building stock by increasing awareness of energy saving retrofits. Studies by the U.S. Environmental Protection Agency (U.S. EPA) found that benchmarking energy use resulted in an average annual savings of 2.4 percent per year for the first three years. However, due to concerns over the potential speculative nature of the reductions in GHG reductions the City included the measure in the CAP, but has not calculated any GHG emission reductions associated with this measure. As the City implements this measure, there will be an effort to develop data necessary to include emission reductions associated with this measure in future CAP updates.

Water and Wastewater

- W1—Implementation of the Water Conservation Master Plan

Quantified

W1 is based on the comprehensive update of the Water Conservation Master Plan. The updated Water Conservation Master Plan outlines measures necessary to comply with state requirements and identifies additional measures to reduce water use that the City is currently implementing and will continue to implement. Based on the water savings included in the plan the City would achieve a reduction in water use of 913 acre-feet as compared to 2013. By 2025, the proposed plan would reduce the City's water consumption by 1,564 acre-feet per year. For modeling purposes, the reductions assume a linear annual reduction stabilizing in 2030. The total reduction in water consumption would be 2,104 acre-feet through 2030. The ratio of imported to local water in 2013 was applied to future water sources for determining GHG emission associated with importing water. The amount of electricity, in kilowatt hours, for water distribution was taken from statewide data and applied to the City's total distributed water to develop the emission reductions. Please refer to the City's Water Conservation Master Plan for water reduction estimates. Detailed GHG reduction calculations are included in Attachment 2.

- W2—Non-Residential Water Use Benchmarking and Disclosure

Not quantified

A large portion of the existing non-residential buildings were constructed prior to California's first adoption of the energy code standards. A time-of-sale disclosure of energy use can increase the efficiency of the City's existing commercial and industrial building stock by increasing awareness of energy saving retrofits. However, due to concerns over the potential speculative nature of GHG reductions, the City has not included any GHG reductions associated with this measure in the calculation of GHG emission reductions. As the City implements this measure, there will be an effort to develop data necessary to include emission reductions associated with this measure in future CAP updates.

- W3—Local Water Supply Development

Quantified

Oceanside is a member of the North San Diego County Water Reuse Coalition, which seeks to convert facilities for recycled water service, increase recycled water storage capacity, connect discrete recycled water systems to one another, distribute recycled water to effectively meet recycled water demands, and replace potable water uses with recycled water components wherever appropriate. Previous efforts in Oceanside have included development of recycled water infrastructure at the San Luis Rey Water Recycling Facility to supply recycled water for use at the Oceanside Municipal Golf Course and Whelan Lake. The CAP incorporates a goal to offset 3.0 million gallons per day of potable water with recycled water by the year 2025. Emission reductions are primarily associated with reductions in the amount of electricity required to treat water and reductions in electricity used to import water to the City. Please refer to the North San Diego County Regional Recycled Water Facilities Plan for water recycling estimates. Detailed GHG reduction calculations are included in Attachment 2.

Solid Waste

- SW1—Implementation of Zero Waste Strategic Resource Plan

Quantified

The City adopted a Zero Waste Strategic Resource Management Plan in June of 2012; however, based on California Department of Resources Recycling and Recovery data, the City had achieved a 57 percent solid waste diversion rate by 2010 under Assembly Bill 341. The Zero Waste Strategic Resource Management Plan established a 75 percent solid waste diversion goal by 2020, which would equate to a total 90 percent reduction in total when considered in light of total reductions. Key recommendations of the Zero Waste Strategic Resource Management Plan are to develop food waste recycling though food banks, provide incentives for producer "cradle-to-cradle" take-back programs, develop reuse partnerships and a reuse warehouse, expand composting services and introduce food composting, expand recycling education and outreach, and develop partnerships with local businesses. The plan also identified a goal of ultimately achieving the international standard for Zero Waste Community of 90 percent solid waste diversion. For modeling purposes, the 75 percent waste diversion was applied to the emission projections though 2020, while the 90 percent goal was applied to the 2035 emissions projections. While some of these measures will have greater effects at different points in time, the~~se~~ total reductions were projected i~~s~~n equal annual reductions. Detailed emission calculations are included in Attachment 2.

- SW2—Beyond 2020 - Enhanced Waste Diversion and Cogeneration

Quantified

Additional measures that can reduce disposal of organic materials in landfills includes (1) increased outreach and incentives for residential and commercial recycling, (2) source reduction of organics, (3)– reduced barriers to composting, and (4) further development of local facilities capable of receiving and/or processing organics for beneficial reuse (e.g., for compost and renewable energy via biogas cogeneration facilities). These facilities include those with anaerobic digestion capacity such as the City's San Luis Rey Water Reclamation Facility. Based on waste diversion and emission factors contained in the Zero Waste Strategic Resource Management Plan and the SEEC Clearpath model, these additional waste diversion measures are projected to achieve the 90 percent reduction goal of the City and were incorporated in to the CAP as Measure SW2. Detailed emission calculations are included in Attachment 2.

Transportation and Land Use

- TL1— Smart Growth Policies

Quantified

The term "smart growth" refers to a compact, efficient, and environmentally sensitive urban development pattern. Smart growth focuses future growth and infill development close to employment, services, and public facilities to maximize the use of existing infrastructure and preserve open space and natural resources. Smart growth is characterized by more compact, higher density development in urbanized areas throughout the region. These areas are walkable, bike-friendly, near public transit, and promote good community design, resulting in housing and transportation choices for those who live and work in these areas. As population increases, smart growth development characteristics can often be the difference between a sense of overcrowding and a feeling of vibrancy.

SANDAG performed previous studies of land use, housing, employment, and transit system densities to identify seven types of Smart Growth Opportunity Areas (SGOA) throughout the County of San Diego. Existing SGOAs within Oceanside include:

- The town center, generally located north of Seagaze Drive, south of Harbor Drive, and west of Interstate 5;
- The mixed-use transit corridor along South Coast Highway between Mission Avenue and the Buena Vista Lagoon (west of Ditmar Street and east of the North County Transit District [NCTD] Coaster line); and
- The mixed-use transit corridor along Oceanside Boulevard between Interstate 5 and Canyon Drive.

SANDAG's *Smart Growth Concept Map* also identifies three *potential* SGOAs in Oceanside[1]:

- A community center centered within ¼-mile of the intersection of Oceanside Boulevard and El Camino Real;
- The community center centered within ¼-mile of the intersection of Oceanside Boulevard and Rancho Del Oro Drive; and
- The community center centered within ¼-mile of the intersection of Oceanside Boulevard and Melrose Drive.

Smart growth policies are anticipated to achieve a total VMT reduction by 2030 of 7,603,285, which was modeled as a 633,607 annual decrease affecting the projected annual increases in VMT through 2030. This assumed the Smart Growth Policy would achieve a 24 percent reduction in distance traveled due to increased density.

■ TL2—Electric Vehicle Promotion

Quantified

Zero emission vehicles (ZEVs) include plug-in electric vehicles (EV), such as battery EV and plug-in hybrid EV, and hydrogen fuel cell vehicles. Use of ZEVs in place of traditional fossil fuel combustion engines results in substantial GHG reductions. ZEVs result in no direct tailpipe emissions. Grid electricity consumed by ZEVs results in approximately 40 percent of the regional emissions of a traditional fossil fueled vehicle. However, unlike the emissions associated with this electricity, which are forecasted to decline as renewable energy sources increase, fossil fueled emission would continue to rise with VMT.

Oceanside can reduce barriers to ZEV market penetration through increased charging structure, incentives, and outreach. As identified in SANDAG's San Diego Regional Plug-in EV Readiness Plan,

[1] Community centers are areas with residential, commercial, and mixed-use development that serve the surrounding neighborhoods, with high-frequency local bus service. SANDAG's minimum target density for mixed-use transit corridors is 20 dwelling units per acre.

expansion of residential charging station infrastructure is most critical, followed by workplace, retail, and public charging stations (SANDAG 2014). CAP goals include increasing local ZEV market share to 20 percent of passenger vehicles by 2030 though promotion of EV infrastructure within the City. Detailed emission calculations are included in Attachment 2.

- TL3—Preferential Parking Spaces for Clean Air Vehicles

Quantified

Emissions are embedded in TL2 as this measure is a support measure for TL2. No additional reductions were taken for this measure.

- TL4—Expand Complete Streets Programs

Quantified

Due to the speculative nature of the reductions in GHG reductions associated with calculating the mode split from private vehicles to bicycles this measure has not been included in the calculation of any reductions in GHG emissions.

- TL5—Transportation Demand Management Plans

Quantified

Transportation Demand Management (TDM) refers to programs and strategies that manage and reduce congestion during peak traffic hours by encouraging the use of transportation alternatives. The City is able to promote TDM strategies through expanded complete street infrastructure; however, site design and employer participation are critical for overcoming first/last mile barriers to alternative modes of travel. A TDM Ordinance can increase implementation of TDM measures and thereby reduce vehicle use associated with new commercial and industrial developments.

Common TDM measures implemented on projects include connections to nearby transit stops and off-site walkways, safety improvements to nearby pedestrian pathways, street lighting, on-site secure bicycle parking, bicycle end-trip facilities such as showers and lockers, preferential clean car and carpool parking, and improvements to adjacent transit stops such as shelters, benches, or other street furniture. Based on research conducted by the California Air Pollution Control Officers Association, measures such as these can achieve a 10 to 30 percent reduction in VMT associated with individual developments. The proposed TDM Ordinance is estimated to achieve a 10 percent reduction in annual VMT from commercial activity in the City. The growth of VMT in this measure is based by employment growth through 2030 and emissions reductions are based on the annual reduction in VMT as employment grows. Detailed calculations are included in Attachment 2.

Agriculture and Forestry

- AF1—Urban Forestry Program

Quantified

Urban tree planting sequesters carbon while also helping to cool an environment by providing shade and evapotranspiration. Based on data from SANDAG's Healthy Communities Assessment Tool, neighborhoods in Oceanside have between a 0.2 and 3.0 percent tree canopy cover, with an average of 1.4 percent canopy cover (SANDAG 2017). Oceanside neighborhoods with the least tree canopy coverage include the tri-city neighborhood, San Luis Rey community, and the Townsite neighborhood (also known as downtown). A Green Streets Ordinance would be developed to increase tree planting associated with new development and the City's Public Works Department. Trees would be planted along transportation corridors and other public rights-of-way. It is anticipated the City's will use the Green Oceanside campaign to facilitate community events dedicated to tree plantings in public or private areas or within community gardens and schools. Based the data developed by the US Forest Service, typical street trees in Southern California sequester about 0.063 tons of CO_2 per tree per year (Center for Urban Forest Research 2001). The 0.063 ton of CO_2 accounts for releases associated with maintenance and decomposition. The CAP goal is to plant a net 200 new trees each year on public rights-of-way and to require development projects to incorporate an annual average of 200 new trees per year for an annual average of 400 net new trees in the City though 2050. Annual tree counts associated with future development is based on the anticipated annual development based on the average number of trees that are typically planted per dwelling units by type, and by square footage of commercial and industrial development. Detailed calculations are included in Attachment 2.

- AF2—Urban Agriculture and Community Gardens

Not Quantified

Urban agriculture includes growing, processing, and distributing food through plant cultivation in and around cities. Food that is grown locally requires less packaging, preservation, and transportation than imported foods and may reduce food waste. Urban agriculture would reduce the consumption of natural resources and generation of GHG emissions associated with food production. However, due to the speculative nature of GHG reductions associated with urban agriculture at this time, the City has not quantified any reductions in GHG emissions associated with implementation of this measure. As the City implements this measure, all available data will be collected so that emission reductions attributed to this type of measure can be quantified in the future.

- AF3—South Morro Hills Agricultural Lands Conservation Program

Quantified

The City includes agricultural lands in the 3,450-acre Morro Hills Community (also known as South Morro Hills). Agricultural production in Morro Hills is estimated to include approximately 700 acres of avocado trees, 400 acres of tomatoes plants, 400 acres of cut flowers, 150 acres of nut trees, 100 acres of bell pepper plants, and 415 acres of other agricultural products such as tropical fruit trees, lemons, limes, berries, wine grapes, brussel sprouts, and herbs. An agricultural easement program can preserve agricultural uses for future generations and avoid increased emissions associated with the development of agricultural lands for residential uses. Based on an easement over 250 acres, the measure would result in an annual average VMT reduction of 4,315,840 over the BAU condition with the existing zoning and land use designations. Detailed calculations are included in Attachment 2.

- AF4—Carbon Farming Program

Not Quantified

The Marin Carbon Project demonstrative carbon farming practices indicate that application of compost topsoil can increase carbon sequestration by 14 MT CO_2e per hectare. Establishment of local carbon farms can demonstrate benefits of sustainable agriculture practices and thereby encourage other agricultural operations to incorporate these practices and develop local carbon credits. However, due to the speculative nature of the reductions from carbon farming at this date, the City has not included any GHG reductions associated with implementation of this measure. As the City implements this measure, there will be an effort to develop data necessary to include emission reductions associated with this measure in future CAP updates.

Summary and Resources

With the exception of three reduction measures–SW1-Implementation of Zero Waste Strategic Resource Plan, SW2-Beyond 2020-Enhanced Waste Diversion, and AF1-Urban Forestry Program–emission reduction estimates for all reduction measures were developed and incorporated into the SEEC Clearpath Model. SEEC Clearpath model data (comma-separated summaries) can be provided upon request. As the SEEC Clearpath Model is unable to account for solid waste reduction strategies or carbon sequestration strategies, emission reduction estimates for the remaining three measures were developed outside the SEEC Clearpath Model and manually applied to forecasts. Emission reduction estimates for various measures were developed based on data from a multitude of sources including:

- ~~U.S. Environmental Protection Agency (~~U.S. EPA~~)~~ data analysis reports on benchmarking and energy use (U.S. EPA 2012)
- U.S. Department of Agriculture (USDA) Forest Service's benefit-Cast analysis of tree carbon sequestration (USDA Forest Service 2001)
- U.S. Department of Energy *Alternative Fuels Data Center Comparison Electricity Sources and Annual Vehicle Emissions, California* (U.S. Department of Energy 2017)
- California Energy Commission (CEC) *Options for Energy Efficiency in Existing Buildings* survey data (CEC 2005);
- California ARB's EMFAC2014 vehicle mix (California ARB 2015)
- SANDAG *Regional Growth Forecast Series 13* population, employment, and housing projections (SANDAG 2013);
- SANDAG *Regional Growth Forecast Series 12* Average Trip Length in San Diego County (SANDAG 2014)
- SANDAG *Trip Generation for Smart Growth Planning Tools for the San Diego Region* study findings (SANDAG 2010)
- City of Oceanside *2015 Water Conservation Master Plan* water use projections (Oceanside 2015)

The reduced communitywide emission forecast and the quantity of emissions reductions for each sector are summarized in **Table 10**. Calculations supporting the development of parameters entered in the SEEC Clearpath Model are included as Attachment 2.

Table 10 Community Emission Forecasts

Sector	Emissions (MT CO_2e)			
	2020	**2030**	**2040**	**2050**
Reduced Forecast				
Residential Energy	207,587	155,919	156,905	157,039
Commercial Energy	157,632	125,738	155,062	193,190
Industrial Energy	43,059	28,901	35,346	44,912
Transportation	410,596	301,354	287,400	301,225
Solid Waste*	32,283	22,785	17,494	17,604
Water & Wastewater	30,324	22,623	20,297	18,720
*CO_2 Sequestration**	*50*	*302*	*554*	806
Total	**881,431**	**657,017**	**671,949**	**731,884**
Reductions from Adjusted Business-As-Usual Forecast				
Residential Energy	0	31,503 (17%)	31,719 (17%)	31,750 (17%)
Commercial Energy	5,089 (3%)	53,666 (30%)	77,147 (33%)	99,899 (34%)
Industrial Energy	2,286 (5%)	21,021 (42%)	32,397 (48%)	44,356 (50%)
Transportation	4,633 (1%)	22,621 (7%)	23,227 (7%)	24,682 (8%)
Solid Waste*	10,331 (24%)	21,346 (48%)	26,854 (61%)	26,854 (60%)
Water & Wastewater	268 (1%)	2,816 (11%)	5,586 (22%)	7,227 (28%)
*CO_2 Sequestration**	*50*	*302*	*554*	806
Total	**22,657 (3%)**	**153,276 (19%)**	**197,485 (23%)**	**235,574 (24%)**

* Reductions in solid waste emissions and CO_2 Sequestration were calculated outside of the SEEC Clearpath Model.

Chapter 5 **Project Review Checklist**

As discussed in the CAP, the Project Review Checklist was designed to assess consistency with GHG reduction measures identified in Chapter 3 of the CAP. Thus, the checklist was developed by identifying measures that would require project-level implementation and identifying specific criteria that can be used to determine if a future development project would include an equitable contribution toward measure goals. **Table 11** below summarizes the relationship between program-level reduction measures and project-level implementation through the Project Review Checklist.

Table 11 Development of Project Review Checklist

CAP Measure	Project-Level Implementation	Checklist?
E1—Renewable Energy Procurement	Measure E1 does not identify strategies that would be implemented at the project-level.	No
E2—Solar Photovoltaic Promotion Program	Measure E1 would include adoption of a Solar Ordinance for New Development. The Ordinance would require that new developments with 50 or more surface parking spaces to offset 50 percent of energy use through on-site renewable energy sources. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for renewable energy. This checklist item would be applicable wherever future development would include 50 or more surface parking spaces and would have a non-negligible electricity demand.	Yes
E3—Residential Energy Conservation and Disclosure Ordinance	Measure E2 does not identify strategies that would be implemented at the project-level.	No
E4—Promotion of Low-Income Financing Programs	Measure E3 does not identify strategies that would be implemented at the project-level.	No
E5—Non-Residential Building Energy Benchmarking and Disclosure	Measure E4 does not identify strategies that would be implemented at the project-level.	No
W1—Implementation of the Water Conservation Master Plan	Measure W1 would include implementation of the City's Water Conservation Master Plan. Plan measures that apply to new development include the California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) requirements, required plan review for water use efficiency for all new business customers, and require installation of Automated Meter Infrastructure (AMI) meters for all new customers. As the Water Utilities Department has already established an enforcement program for these Plan measures, no checklist measure is necessary.	No
W2—Non-Residential Water Use Benchmarking and Disclosure	Measure W2 does not identify strategies that would be implemented at the project-level.	No

Table 11 Development of Project Review Checklist

CAP Measure	Project-Level Implementation	Checklist?
W3—Local Water Supply Development	Measure W3 would include capital improvements to increase the supply capacity of recycled water. While Measure W3 does not specifically call for implementation at the project-level, it is assumed that future development would use recycled water where feasible. The checklist item includes incorporation of service connections for recycled water use; this checklist item would be applicable wherever future development may feasibly offset potable water use with recycled water and where the project is located in a serviceable area.	Yes
SW1—Implementation of Zero Waste Strategic Resource Plan	Measure SW1 does not identify strategies that would be implemented at the project-level.	No
SW2—Beyond 2020 – Enhanced Waste Diversion	Measure SW2 does not identify strategies that would be implemented at the project-level.	No
TL1— Smart Growth Policies	Transportation forecasts are based on the proposed land use pattern from the 2017 General Plan Update that is being prepared concurrently with the CAP. Measure TL1 would include adopting smart growth development policies – specifically, the majority of new development of housing units and employment generating land uses would be sited in Smart Growth Opportunity Areas (SGOAs). Thus, at the project-level, all projects sited outside an SGOA are assumed to develop uses that would be consistent with land use designation and all projects sited inside an SGOA are assumed to develop uses that are consistent with the character of the SGOA type. The minimum SGOA target densities identified by SANDAG are considered the most applicable criteria for determining whether a proposed land use would be consistent with the character of an SGOA type. The set of checklist item includes the limitations on proposed land uses. This set of checklist item would be applicable wherever future development would result in non-negligible vehicle trip generation.	Yes
TL2—Expanded Electric Vehicle Charging Infrastructure	Measure TL2 would include adoption of an Electric Vehicle Infrastructure Ordinance. The Ordinance would require all residential, commercial, and industrial development projects to prewire a portion of parking spaces to allow for future installation of electric vehicle charging stations. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for prewiring parking spaces. This checklist item would be applicable wherever future development would include parking spaces.	Yes
TL3—Preferential Parking Spaces for Zero Emission Vehicles	Measure TL3 would include adoption of a Clean Air Vehicle Parking Ordinance. The Ordinance would require commercial and industrial development projects incorporate 12 percent designated parking spaces for clean air vehicles. As the Ordinance and associated enforcement program will be adopted several months after CAP adoption, the checklist measure includes the Ordinance's requirement for providing preferential parking for clean air vehicles. This checklist item would be applicable wherever future development would include commercial or industrial uses with parking spaces.	Yes
TL4—Expand Complete Streets	Measure TL4 would include requiring new developments to provide connections and/or extensions of the bicycle and pedestrian networks where applicable. This requirement would be enforced at the City's discretion subsequent to the next Bicycle and/or Pedestrian Master Plan Update. As the criteria for enforcement would not be established until the Bicycle and/or Pedestrian Master Plan Update reductions associated with Measure TL4 were not quantified. Until specific criteria for enforcement are identified, no checklist measure is necessary.	No

Table 11 Development of Project Review Checklist

CAP Measure	Project-Level Implementation	Checklist?
TL5—Transportation Demand Management Plans	Measure TL5 would include adoption of a Transportation Demand Management (TDM) Ordinance. The Ordinance would require new or renovated commercial and industrial development projects that would generate more than 100 vehicle trips per day. The Ordinance, associated enforcement program, and specific TDM measures will be adopted approximately a year after CAP adoption. Measure TL5 goals include reducing VMT associated with new commercial and industrial development projects that would generate more than 100 vehicle trips per day by 10 percent. The checklist measure includes the TDM strategies with a point system where each point is estimated to equate to a 1 percent VMT reduction. The number of points associated with implementation of each TDM measure was based on data from the California Air Pollution Control District's (CAPCOA) Report Quantifying Greenhouse Gas Mitigation Measures, A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures (CAPCOA 2010). The dollar amount per point for monthly parking cash-out programs and discounted transit programs was also derived from pertinent study data and mode choice elasticities identified in the report[2,3]. Projects that would achieve 10 points would be anticipated to achieve a 10 percent VMT reduction, and thus would be consistent with the Measure TL5 goal. This checklist item would be applicable wherever future development would include commercial or industrial uses that would generate more than 100 vehicle trips per day.	Yes
AF1—Urban Forestry Program	Measure E1 would include adoption of a Green Streets Ordinance. The Ordinance would require that new developments projects incorporate shade trees and establishes a goal of requiring that overall new development projects incorporate an average of 200 additional trees per year. The criteria for determining how many trees each individual development project would need to incorporate would not be established in the Green Streets Ordinance. Until adoption of the Green Streets Ordinance, interim criteria shall be one tree per each single-family residence, one tree per three multi-family residences, and one tree for each 14 jobs. Based on the SANDAG Series 13 Regional Growth Forecast between 2020 and 2030, development in Oceanside is anticipated to result in approximately 367 single-family residences and 2,221 multi-family residences. Based on employment projections developed by Keyser Marston Associates, employment is anticipated to increase by approximately 28,732 between 2014 and 2035. Therefore, it is estimated that average annual development would include at least 37 single-family residences, 221 multi-family residences, and non-residential uses that create 1,368 jobs. Based on this development that meets the interim criteria would result approximately 226 additional trees per year; this would demonstrate consistency with the Measure AF1 goal of planting an additional 200 trees per year.	Yes

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2 Assuming an annual vehicle cost of $4,000, each $20 parking fee/cash-out equates to 6% increase/decrease in transportation costs. Based on a transportation mode choice elasticity of 0.4 and 0.85 factor adjustment for vehicle ownership to VMT, a $20 parking fee/cash-out would result in a 2.0% reduction in automotive use. Thus, $20 parking fee/cash-out was valued at 2 points.

3 Commute trip reduction for a "low density suburb, mode neutral" is identified at approximately 8% for a $3 daily transit subsidy. Assuming commute trip reduction scales linearly with the amount of the subsidy, a $0.75 daily transit subsidy would equate to a 2.0% reduction. Thus, each $0.75 of daily transit subsidy was valued at 2 points.

Table 11 Development of Project Review Checklist

CAP Measure	Project-Level Implementation	Checklist?
	This checklist item would be applicable wherever future development would develop new land uses.	
AF2—Urban Agriculture and Community Gardens	Measure AF2 does not identify strategies that would be implemented at the project-level.	No
AF3—South Morro Hills Agricultural Lands Conservation Program	Measure AF3 does not identify strategies that would be implemented at the project-level.	No
AF4—Carbon Farming Program	Measure AF4 does not identify strategies that would be implemented at the project-level.	No

Chapter 6 **References**

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ATTACHMENT 1

Technical Sources

SERIES 13 REGIONAL GROWTH FORECAST

City of Oceanside

POPULATION AND HOUSING

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Total Population	169,319	177,840	188,597	189,377	20,058	12%
Household Population	168,383	177,023	187,609	188,278	19,895	12%
Group Quarters Population	936	817	988	1,099	163	17%
Civilian	936	817	988	1,099	163	17%
Military	0	0	0	0	0	0%
Total Housing Units	65,469	67,817	70,395	70,942	5,473	8%
Single Family	42,196	42,996	43,363	43,709	1,513	4%
Multiple Family	19,761	21,518	23,729	23,934	4,173	21%
Mobile Homes	3,512	3,303	3,303	3,299	-213	-6%
Occupied Housing Units	60,097	61,902	65,370	65,880	5,783	10%
Single Family	39,229	39,715	40,820	41,156	1,927	5%
Multiple Family	17,825	19,280	21,660	21,883	4,058	23%
Mobile Homes	3,043	2,907	2,890	2,841	-202	-7%
Vacancy Rate	8.2%	8.7%	7.1%	7.1%	-1.1	-13%
Single Family	7.0%	7.6%	5.9%	5.8%	-1.2	-17%
Multiple Family	9.8%	10.4%	8.7%	8.6%	-1.2	-12%
Mobile Homes	13.4%	12.0%	12.5%	13.9%	0.5	4%
Persons per Household	2.80	2.86	2.87	2.86	0.1	2%

HOUSEHOLD INCOME (real 2010 dollars, adjusted for inflation)

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Households by Income Category						
Less than $15,000	4,506	4,277	3,782	3,186	-1,320	-29%
$15,000-$29,999	6,695	6,736	6,162	5,360	-1,335	-20%
$30,000-$44,999	7,976	7,848	7,473	6,738	-1,238	-16%
$45,000-$59,999	7,637	7,758	7,663	7,155	-482	-6%
$60,000-$74,999	7,126	7,013	7,180	6,931	-195	-3%
$75,000-$99,999	9,393	9,388	10,047	10,113	720	8%
$100,000-$124,999	6,118	6,613	7,452	7,871	1,753	29%
$125,000-$149,999	3,659	4,422	5,230	5,766	2,107	58%
$150,000-$199,999	3,929	4,698	5,903	6,892	2,963	75%
$200,000 or more	3,058	3,149	4,478	5,868	2,810	92%
Total Households	60,097	61,902	65,370	65,880	5,783	10%

*IMPORTANT INFORMATION ABOUT THIS FORECAST:

This forecast was accepted by the SANDAG Board of Directors in October 2013 for distribution and use in planning and other studies. This forecast represents one possibility for future growth in the San Diego region. It is intended to represent a likely prediction of future growth, but it is not intended to be a prescription for growth. The Series 13 Regional Growth Forecast represents a combination of economic and demographic projections, existing land use plans and policies, as well as potential land use plan changes that may occur in the region between 2030 and 2050. In general, growth between 2012 and 2030 is based on adopted land use plans and policies, and growth between 2030 and 2050 includes alternatives that may, in some cases, reach beyond existing adopted plans.

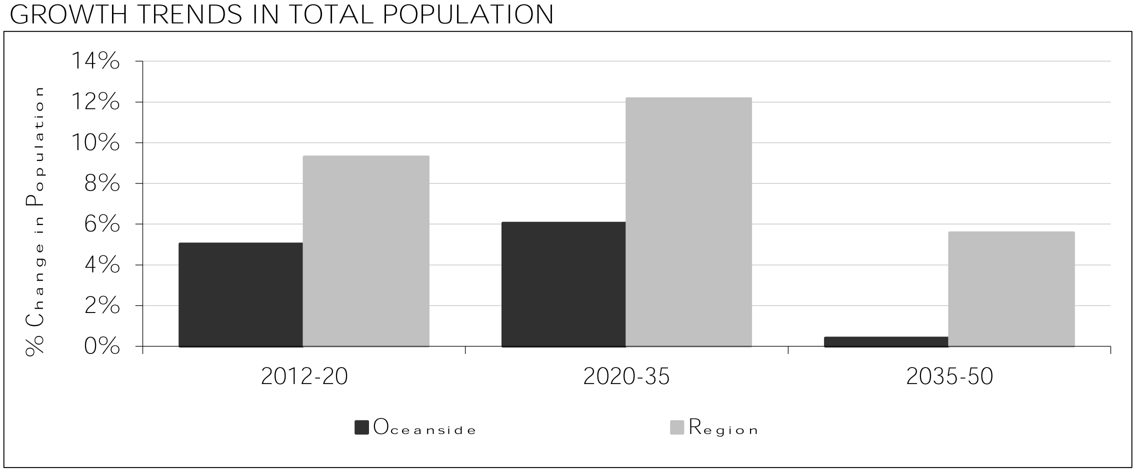
POPULATION BY AGE

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Total Population	169,319	177,840	188,597	189,377	20,058	12%
Under 5	13,346	15,572	14,558	14,671	1,325	10%
5 to 9	10,783	11,541	11,774	11,944	1,161	11%
10 to 14	10,683	10,358	11,067	11,180	497	5%
15 to 17	7,058	6,093	6,542	6,488	-570	-8%
18 to 19	4,879	3,674	3,826	3,619	-1,260	-26%
20 to 24	13,202	12,842	12,069	11,507	-1,695	-13%
25 to 29	13,262	14,245	12,573	12,591	-671	-5%
30 to 34	11,611	12,068	11,882	12,134	523	5%
35 to 39	10,095	11,417	11,878	11,194	1,099	11%
40 to 44	10,761	10,160	12,486	10,987	226	2%
45 to 49	11,000	9,979	11,136	10,691	-309	-3%
50 to 54	11,693	10,538	11,169	11,362	-331	-3%
55 to 59	10,195	10,776	9,440	11,271	1,076	11%
60 to 61	3,355	4,057	3,379	3,771	416	12%
62 to 64	4,932	5,939	5,239	5,872	940	19%
65 to 69	6,204	8,612	8,657	9,277	3,073	50%
70 to 74	4,622	7,293	9,085	7,937	3,315	72%
75 to 79	4,024	5,092	8,768	7,380	3,356	83%
80 to 84	3,673	3,556	6,871	6,554	2,881	78%
85 and over	3,941	4,028	6,198	8,947	5,006	127%
Median Age	34.9	36.1	39.2	39.7	4.8	14%

POPULATION BY RACE AND ETHNICITY

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Total Population	169,319	177,840	188,597	189,377	20,058	12%
Hispanic	63,050	73,732	89,615	100,879	37,829	60%
Non-Hispanic	106,269	104,108	98,982	88,498	-17,771	-17%
White	79,983	76,616	67,812	56,413	-23,570	-29%
Black	6,561	6,197	4,183	1,857	-4,704	-72%
American Indian	626	568	539	478	-148	-24%
Asian	10,791	11,926	16,025	18,228	7,437	69%
Hawaiian / Pacific Islander	2,044	2,050	1,975	2,033	-11	-1%
Other	348	359	404	425	77	22%
Two or More Races	5,916	6,392	8,044	9,064	3,148	53%

GROWTH TRENDS IN TOTAL POPULATION



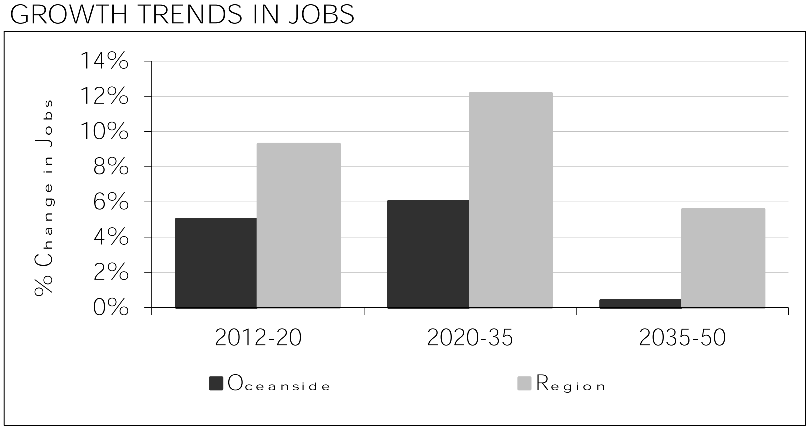
EMPLOYMENT

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Jobs	41,974	48,199	53,277	53,992	12,018	29%
Civilian Jobs	41,974	48,199	53,277	53,992	12,018	29%
Military Jobs	0	0	0	0	0	0%

LAND USE[1]

	2012	2020	2035	2050	2012 to 2050 Change* Numeric	Percent
Total Acres	26,834	26,834	26,834	26,834	0	0%
Developed Acres	20,516	21,499	21,964	22,063	1,548	8%
Low Density Single Family	671	671	671	671	0	0%
Single Family	7,009	7,669	7,811	7,881	873	12%
Multiple Family	941	1,040	1,122	1,128	187	20%
Mobile Homes	212	199	199	199	-13	-6%
Other Residential	45	45	45	45	0	-1%
Mixed Use	0	55	43	43	43	--
Industrial	942	893	984	994	51	5%
Commercial/Services	1,786	1,842	1,913	1,924	138	8%
Office	85	103	120	121	36	43%
Schools	658	667	680	680	22	3%
Roads and Freeways	3,853	4,003	4,003	4,003	150	4%
Agricultural and Extractive[2]	2,750	2,745	2,807	2,807	57	2%
Parks and Military Use	1,563	1,567	1,567	1,567	4	0%
Vacant Developable Acres	1,653	684	219	120	-1,533	-93%
Low Density Single Family	81	81	5	5	-75	-93%
Single Family	947	278	122	47	-900	-95%
Multiple Family	78	6	2	1	-77	-99%
Mixed Use	44	11	0	0	-44	-100%
Industrial	229	128	38	28	-201	-88%
Commercial/Services	190	128	23	12	-179	-94%
Office	31	12	2	0	-31	-99%
Schools	22	13	0	0	-22	-100%
Parks and Other	4	0	0	0	-4	-100%
Future Roads and Freeways	26	26	26	26	0	0%
Constrained Acres	4,651	4,651	4,651	4,651	0	0%
Employment Density[3]	12.1	13.6	14.3	14.4	2.3	19%
Residential Density[4]	7.4	7.0	7.1	7.1	-0.2	-3%

GROWTH TRENDS IN JOBS



Notes:

1 - Figures may not add to total due to independent rounding.
2 - This is not a forecast of agricultural land, because the 2050 Regional Growth Forecast does not account for land that may become agricultural in the future. Also, some types of development that occur on agricultural land, such as low density single family residential, may allow for the continuation of existing agricultural use.
3 - Civilian jobs per developed employment acre (industrial, retail, office, schools, and half of mixed use acres).
4 - Total housing units per developed

2012

JURISDICTION	TOTAL VMT	TOTAL City of Oceanside VMT	Two Trip End City of Oceanside VMT	One Trip End City of Oceanside VMT	NON-City of Oceanside VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E - E
CARLSBAD TOTAL	3,116,717	615,509	-	615,509	2,501,208
CHULA VISTA TOTAL	3,336,416	4,574	-	4,574	3,331,842
CORONADO TOTAL	371,399	356	-	356	371,043
DEL MAR TOTAL	78,140	1,384	-	1,384	76,756
EL CAJON TOTAL	1,723,964	2,052	-	2,052	1,721,912
ENCINITAS TOTAL	1,901,087	187,797	-	187,797	1,713,290
ESCONDIDO TOTAL	2,703,709	73,071	-	73,071	2,630,638
External TOTAL	204,259	5,374	-	5,374	198,885
IMPERIAL BEACH TOTAL	85,821	5	-	5	85,816
LA MESA TOTAL	1,525,835	1,110	-	1,110	1,524,725
LEMON GROVE TOTAL	710,306	514	-	514	709,792
NATIONAL CITY TOTAL	1,505,957	3,180	-	3,180	1,502,777
OCEANSIDE TOTAL	2,845,391	1,874,724	616,005	1,258,719	970,667
POWAY TOTAL	842,944	3,616	-	3,616	839,328
SAN DIEGO TOTAL	36,132,397	375,951	-	375,951	35,756,446
SAN MARCOS TOTAL	1,801,500	169,407	-	169,407	1,632,093
SANTEE TOTAL	884,395	3,849	-	3,849	880,546
SOLANA BEACH TOTAL	527,188	42,950	-	42,950	484,238
Unincorporated TOTAL	17,064,917	1,219,852	-	1,219,852	15,845,065
VISTA TOTAL	1,554,384	496,956	-	496,956	1,057,428
REGIONWIDE TOTAL	78,916,726	5,082,231	616,005	4,466,226	73,834,495

2015 (Factored from 2014)

JURISDICTION	TOTAL VMT	TOTAL City of Oceanside VMT	Two Trip End City of Oceanside VMT	One Trip End City of Oceanside VMT	NON-City of Oceanside VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E - E
CARLSBAD TOTAL	3,176,367	629,406	-	629,406	2,546,961
CHULA VISTA TOTAL	3,581,943	4,753	-	4,753	3,577,190
CORONADO TOTAL	395,934	398	-	398	395,536
DEL MAR TOTAL	79,850	1,452	-	1,452	78,397
EL CAJON TOTAL	1,834,279	2,279	-	2,279	1,832,001
ENCINITAS TOTAL	1,939,925	195,016	-	195,016	1,744,909
ESCONDIDO TOTAL	2,799,486	76,438	-	76,438	2,723,048
External TOTAL	237,659	6,021	-	6,021	231,638
IMPERIAL BEACH TOTAL	88,910	4	-	4	88,906
LA MESA TOTAL	1,598,212	1,356	-	1,356	1,596,855
LEMON GROVE TOTAL	753,179	657	-	657	752,523
NATIONAL CITY TOTAL	1,569,263	3,140	-	3,140	1,566,123
OCEANSIDE TOTAL	2,956,856	1,956,030	652,815	1,303,215	1,000,826
POWAY TOTAL	860,404	3,786	-	3,786	856,617
SAN DIEGO TOTAL	37,499,219	399,911	-	399,911	37,099,309
SAN MARCOS TOTAL	1,865,468	177,799	-	177,799	1,687,669
SANTEE TOTAL	917,075	4,165	-	4,165	912,910
SOLANA BEACH TOTAL	538,687	45,182	-	45,182	493,504
Unincorporated TOTAL	17,727,423	1,275,924	-	1,275,924	16,451,499
VISTA TOTAL	1,613,023	523,740	-	523,740	1,089,283
REGIONWIDE TOTAL	82,033,162	5,307,456	652,815	4,654,641	76,725,705

2020 Revenue Constrained

JURISDICTION	TOTAL VMT	TOTAL City of Oceanside VMT	Two Trip End City of Oceanside VMT	One Trip End City of Oceanside VMT	NON-City of Oceanside VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E-E
CARLSBAD TOTAL	3,528,338	699,086	-	699,086	2,829,252
CHULA VISTA TOTAL	3,923,612	5,167	-	5,167	3,918,445
CORONADO TOTAL	375,290	463	-	463	374,827
DEL MAR TOTAL	76,846	1,541	-	1,541	75,305
EL CAJON TOTAL	1,826,681	2,383	-	2,383	1,824,298
ENCINITAS TOTAL	2,075,730	209,696	-	209,696	1,866,034
ESCONDIDO TOTAL	2,946,344	67,302	-	67,302	2,879,042
External TOTAL	232,506	6,191	-	6,191	226,315
IMPERIAL BEACH TOTAL	84,253	9	-	9	84,244
LA MESA TOTAL	1,599,071	1,181	-	1,181	1,597,890
LEMON GROVE TOTAL	738,270	598	-	598	737,672
NATIONAL CITY TOTAL	1,577,884	3,322	-	3,322	1,574,562
OCEANSIDE TOTAL	3,103,945	1,998,825	663,798	1,335,027	1,105,120
POWAY TOTAL	899,898	3,739	-	3,739	896,159
SAN DIEGO TOTAL	38,618,913	409,299	-	409,299	38,209,614
SAN MARCOS TOTAL	1,954,357	174,450	-	174,450	1,779,907
SANTEE TOTAL	958,856	4,225	-	4,225	954,631
SOLANA BEACH TOTAL	575,262	49,723	-	49,723	525,539
Unincorporated TOTAL	18,734,276	1,230,385	-	1,230,385	17,503,891
VISTA TOTAL	1,621,429	510,261	-	510,261	1,111,168
REGIONWIDE TOTAL	85,451,761	5,377,846	663,798	4,714,048	80,073,915

2035 Revenue Constrained

	JURISDICTION	TOTAL VMT	TOTAL City of Oceanside VMT	Two Trip End City of Oceanside VMT	One Trip End City of Oceanside VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E - E
CARLSBAD TOTAL	3,745,078	735,114	-	735,114	3,009,964
CHULA VISTA TOTAL	4,592,962	7,150	-	7,150	4,585,812
CORONADO TOTAL	378,495	490	-	490	378,005
DEL MAR TOTAL	75,012	1,205	-	1,205	73,807
EL CAJON TOTAL	2,003,424	2,597	-	2,597	2,000,827
ENCINITAS TOTAL	2,184,918	217,318	-	217,318	1,967,600
ESCONDIDO TOTAL	3,188,414	70,022	-	70,022	3,118,392
External TOTAL	277,760	7,079	-	7,079	270,681
IMPERIAL BEACH TOTAL	91,980	17	-	17	91,963
LA MESA TOTAL	1,780,837	1,838	-	1,838	1,778,999
LEMON GROVE TOTAL	778,729	538	-	538	778,191
NATIONAL CITY TOTAL	1,748,880	4,228	-	4,228	1,744,652
OCEANSIDE TOTAL	3,403,004	2,204,031	731,385	1,472,646	1,198,973
POWAY TOTAL	964,141	3,859	-	3,859	960,282
SAN DIEGO TOTAL	41,817,585	429,589	-	429,589	41,387,996
SAN MARCOS TOTAL	2,249,551	190,759	-	190,759	2,058,792
SANTEE TOTAL	1,040,136	4,472	-	4,472	1,035,664
SOLANA BEACH TOTAL	613,882	51,609	-	51,609	562,273
Unincorporated TOTAL	21,070,411	1,335,612	-	1,335,612	19,734,799
VISTA TOTAL	1,865,470	567,854	-	567,854	1,297,616
REGIONWIDE TOTAL	93,870,669	5,835,381	731,385	5,103,996	88,035,288

2014					
JURISDICTION	TOTAL VMT	TOTAL City of Oceanside VMT	Two Trip End City of Oceanside VMT	One Trip End City of Oceanside VMT	NON-City of Oceanside VMT
		I-I, I-E and E-I	I-I	I-E and E-I	E-E
CARLSBAD TOTAL	3,144,918	623,174	-	623,174	2,521,744
CHULA VISTA TOTAL	3,546,478	4,706	-	4,706	3,541,772
CORONADO TOTAL	392,014	394	-	394	391,620
DEL MAR TOTAL	79,059	1,438	-	1,438	77,621
EL CAJON TOTAL	1,816,118	2,256	-	2,256	1,813,862
ENCINITAS TOTAL	1,920,718	193,085	-	193,085	1,727,633
ESCONDIDO TOTAL	2,771,768	75,681	-	75,681	2,696,087
External TOTAL	235,306	5,961	-	5,961	229,345
IMPERIAL BEACH TOTAL	88,030	4	-	4	88,026
LA MESA TOTAL	1,582,388	1,343	-	1,343	1,581,045
LEMON GROVE TOTAL	745,722	650	-	650	745,072
NATIONAL CITY TOTAL	1,553,726	3,109	-	3,109	1,550,617
OCEANSIDE TOTAL	2,927,580	1,936,663	646,351	1,290,312	990,917
POWAY TOTAL	851,885	3,749	-	3,749	848,136
SAN DIEGO TOTAL	37,127,940	395,951	-	395,951	36,731,989
SAN MARCOS TOTAL	1,846,998	176,039	-	176,039	1,670,959
SANTEE TOTAL	907,995	4,124	-	4,124	903,871
SOLANA BEACH TOTAL	533,353	44,735	-	44,735	488,618
Unincorporated TOTAL	17,551,904	1,263,291	-	1,263,291	16,288,613
VISTA TOTAL	1,517,198	503,913	-	503,913	1,013,285
REGIONWIDE TOTAL	81,141,098	5,240,266	646,351	4,593,915	75,900,832

TABLE 1

EMPLOYMENT PROJECTIONS, 2014 - 2035
GENERAL PLAN UPDATE
CITY OF OCEANSIDE

Sector	Number of Employees 2014 (1)	Projected Average Annual Rate 2014 - 2035 (2)	Number of Employees 2035
Commercial			
Office			
Information	465	2.0%	705
Finance and Insurance	624	3.0%	1,161
Real Estate and Rental, and Leasing	790	3.0%	1,470
Professional, Scientific, and Technical Services	1,745	2.0%	2,645
Management of Companies and Enterprises	314	2.0%	476
Administration & Support, Waste Management and Remediation	2,401	2.0%	3,639
Health Care and Social Assistance	6,111	4.0%	13,926
Retail			
Wholesale Trade	1,702	2.0%	2,580
Retail Trade	5,506	2.5%	9,248
Accommodation and Food Services	5,082	3.0%	9,454
Industrial			
Mining, Quarrying, and Oil and Gas Extraction	0	0.0%	0
Utilities	152	2.0%	230
Construction	1,532	1.0%	1,888
Manufacturing	3,781	4.0%	8,616
Transportation and Warehousing	885	3.0%	1,646
Agriculture, Open Space, and Institutional			
Agriculture, Forestry, Fishing, and Hunting	731	1.0%	901
Education Services	2,373	1.0%	2,924
Arts, Entertainment, and Recreation	932	1.0%	1,149
Public Administration	835	2.0%	1,266
Other			
Other Services (excluding Public Administration)	1,491	2.0%	2,260
Total	**37,452**	**2.7%**	**66,182**

(1) Source: Work Area Profile Report - City of Oceanside, U.S. Census Bureau, OnTheMap Application. Reflects employment by place of work for 2014.
(2) KMA estimates based on review of City and County recent average annual growth rates. See Worksheet 1.

WORKSHEET 1

HISTORIC EMPLOYMENT TRENDS, CITY VS. COUNTY, 2009 - 2014 (1)
GENERAL PLAN UPDATE
CITY OF OCEANSIDE

	City of Oceanside			County of San Diego		
Sector	**Number of Employees 2009**	**Number of Employees 2014**	**Average Annual Rate 2009 - 2014**	**Number of Employees 2009**	**Number of Employees 2014**	**Average Annual Rate 2009 - 2014**
Commercial						
Office						
Information	454	465	0.5%	37,981	26,813	-6.7%
Finance and Insurance	508	624	4.2%	41,040	41,913	0.4%
Real Estate and Rental, and Leasing	674	790	3.2%	26,085	27,473	1.0%
Professional, Scientific, and Technical Services	3,192	1,745	-11.4%	115,285	137,436	3.6%
Management of Companies and Enterprises	305	314	0.6%	18,055	23,384	5.3%
Administration & Support, Waste Management…	2,384	2,401	0.1%	74,366	81,544	1.9%
Health Care and Social Assistance	4,992	6,111	4.1%	132,666	169,418	5.0%
Retail						
Wholesale Trade	1,779	1,702	-0.9%	43,768	48,223	2.0%
Retail Trade	4,918	5,506	2.3%	116,681	131,523	2.4%
Accommodation and Food Services	4,729	5,082	1.5%	126,001	148,902	3.4%
Industrial						
Mining, Quarrying, and Oil and Gas Extraction	1	-	-100.0%	374	420	2.3%
Utilities	172	152	-2.4%	4,604	7,097	9.0%
Construction	1,719	1,532	-2.3%	61,748	64,916	1.0%
Manufacturing	2,199	3,781	11.4%	97,304	98,472	0.2%
Transportation and Warehousing	701	885	4.8%	20,180	22,070	1.8%
Agriculture, Open Space, and Institutional						
Agriculture, Forestry, Fishing, and Hunting	1,077	731	-7.5%	9,933	10,233	0.6%
Education Services	5,287	2,373	-14.8%	136,374	132,044	-0.6%
Arts, Entertainment, and Recreation	971	932	-0.8%	36,062	37,433	0.7%
Public Administration	861	835	-0.6%	31,914	51,105	9.9%
Other						
Other Services (excluding Public Administration)	1,895	1,491	-4.7%	62,516	48,952	-4.8%
Total	**38,818**	**37,452**	**-0.7%**	**1,192,937**	**1,309,371**	**1.9%**

(1) Source: Work Area Profile Report - City of Oceanside/County of San Diego, U.S. Census Bureau, OnTheMap Application.

Vehicle Emission Factor Set Derrivation

EMFAC Outputs							Derrived Factors							
Year	sub_area	vehicle	CO2	CH4	NOx	vmt	CO2/mile	CH4/mile	Mix	CO2 Contribution	CH4 Contribution	CO2e/mile	tons CO2e/mile	kg CO2e/mile
2013	San Diego (SD)	LDA	14996.53	0.79485	8.438426	38040859	0.000394	2.09E-08	0.525854	0.000207303	1.09875E-08	0.000208		
2013	San Diego (SD)	LDT1	1867.808	0.170159	1.956557	4067991.1	0.000459	4.18E-08	0.056233	2.58195E-05	2.35217E-09	2.59E-05		
2013	San Diego (SD)	LDT2	7868.841	0.300733	4.874767	14640587	0.000537	2.05E-08	0.202383	0.000108774	4.15715E-09	0.000109		
2013	San Diego (SD)	MDV	6709.144	0.305758	4.549628	9735300.1	0.000689	3.14E-08	0.134575	9.27432E-05	4.22662E-09	9.29E-05		
2013	San Diego (SD)	MH	208.0742	0.016098	0.395436	148552.3	0.001401	1.08E-07	0.002053	2.87629E-06	2.22526E-10	2.88E-06		
2013	San Diego (SD)	MCY	108.3258	0.265539	0.747646	528379.95	0.000205	5.03E-07	0.007304	1.49743E-06	3.67065E-09	1.6E-06		
2013	San Diego (SD)	LHDT1	1590.84	0.113446	6.577916	1900576.6	0.000837	5.97E-08	0.026272	2.19908E-05	1.56821E-09	2.2E-05	0.000540	0.490
2013	San Diego (SD)	LHDT2	371.631	0.014409	1.453187	424708.33	0.000875	3.39E-08	0.005871	5.13721E-06	1.99175E-10	5.14E-06		
2013	San Diego (SD)	MHDT	1364.242	0.058226	8.212191	990656.73	0.001377	5.88E-08	0.013694	1.88585E-05	8.0488E-10	1.89E-05		
2013	San Diego (SD)	HHDT	3162.542	0.222613	18.43634	1492711.5	0.002119	1.49E-07	0.020634	4.37171E-05	3.07727E-09	4.38E-05		
2013	San Diego (SD)	SBUS	67.82497	0.005284	0.539197	48555.948	0.001397	1.09E-07	0.000671	9.37572E-07	7.30403E-11	9.4E-07		
2013	San Diego (SD)	UBUS	447.3406	0.569955	3.273778	188058.57	0.002379	3.03E-06	0.0026	6.18377E-06	7.87872E-09	6.4E-06		
2013	San Diego (SD)	OBUS	209.2943	0.008768	0.777172	134140.91	0.00156	6.54E-08	0.001854	2.89316E-06	1.21205E-10	2.9E-06		
2020	San Diego (SD)	LDA	15555.41	0.496217	5.007943	48427688	0.000321	1.02E-08	0.588316	0.000188972	6.02822E-09	0.000189		
2020	San Diego (SD)	LDT1	1417.713	0.068194	0.791729	3532449.5	0.000401	1.93E-08	0.042913	1.72229E-05	8.28445E-10	1.72E-05		
2020	San Diego (SD)	LDT2	6833.662	0.137385	1.945325	15183036	0.00045	9.05E-09	0.184449	8.30177E-05	1.669E-09	8.31E-05		
2020	San Diego (SD)	MDV	5452.596	0.156827	2.159541	9120030.4	0.000598	1.72E-08	0.110793	6.624E-05	1.90519E-09	6.63E-05		
2020	San Diego (SD)	MH	143.6086	0.006526	0.207493	104625.65	0.001373	6.24E-08	0.001271	1.74461E-06	7.92827E-11	1.75E-06		
2020	San Diego (SD)	MCY	108.174	0.287346	0.701227	508817.78	0.000213	5.65E-07	0.006181	1.31414E-06	3.49078E-09	1.41E-06		
2020	San Diego (SD)	LHDT1	1118.44	0.052703	3.666739	1423541.1	0.000786	3.7E-08	0.017294	1.35872E-05	6.40251E-10	1.36E-05	0.000452	0.410
2020	San Diego (SD)	LHDT2	374.6354	0.007315	0.738492	457477.15	0.000819	1.6E-08	0.005558	4.5512E-06	8.88631E-11	4.55E-06		
2020	San Diego (SD)	MHDT	1732.702	0.019171	3.844465	1278664.7	0.001355	1.5E-08	0.015534	2.10495E-05	2.32899E-10	2.11E-05		
2020	San Diego (SD)	HHDT	3705.794	0.266802	10.34641	1894969.4	0.001956	1.41E-07	0.023021	4.50193E-05	3.24121E-09	4.51E-05		
2020	San Diego (SD)	SBUS	82.35252	0.002769	0.428609	61314.352	0.001343	4.52E-08	0.000745	1.00045E-06	3.36406E-11	1E-06		
2020	San Diego (SD)	UBUS	363.5794	0.367401	1.652069	166596.28	0.002182	2.21E-06	0.002024	4.41689E-06	4.46331E-09	4.54E-06		
2020	San Diego (SD)	OBUS	239.0971	0.004254	0.454003	156530.59	0.001527	2.72E-08	0.001902	2.90463E-06	5.1685E-11	2.91E-06		
2030	San Diego (SD)	LDA	12217.92	0.334568	3.21197	55246599	0.000221	6.06E-09	0.616428	0.000136325	3.73303E-09	0.000136		
2030	San Diego (SD)	LDT1	984.0759	0.023951	0.285671	3332668.8	0.000295	7.19E-09	0.037185	1.09801E-05	2.67242E-10	1.1E-05		
2030	San Diego (SD)	LDT2	4619.13	0.065372	0.836919	15899422	0.000291	4.11E-09	0.177402	5.15392E-05	7.2941E-10	5.16E-05		
2030	San Diego (SD)	MDV	3277.529	0.056303	0.734604	8754804.3	0.000374	6.43E-09	0.097684	3.65699E-05	6.28214E-10	3.66E-05		
2030	San Diego (SD)	MH	92.64672	0.000858	0.076951	70092.82	0.001322	1.22E-08	0.000782	1.03373E-06	9.57114E-12	1.03E-06		
2030	San Diego (SD)	MCY	109.3842	0.301101	0.685945	503373.32	0.000217	5.98E-07	0.005617	1.22048E-06	3.35961E-09	1.31E-06		
2030	San Diego (SD)	LHDT1	769.4434	0.017347	1.222671	1083576.9	0.00071	1.6E-08	0.01209	8.58527E-06	1.93552E-10	8.59E-06	0.000326	0.296
2030	San Diego (SD)	LHDT2	359.4808	0.003899	0.197447	473166.03	0.00076	8.24E-09	0.005279	4.011E-06	4.35034E-11	4.01E-06		
2030	San Diego (SD)	MHDT	2073.127	0.008287	2.850391	1583034.3	0.00131	5.23E-09	0.017663	2.31315E-05	9.24603E-11	2.31E-05		
2030	San Diego (SD)	HHDT	4052.885	0.355548	5.299615	2283255.4	0.001775	1.56E-07	0.025476	4.52211E-05	3.96712E-09	4.53E-05		
2030	San Diego (SD)	SBUS	88.22328	0.002647	0.204827	70343.813	0.001254	3.76E-08	0.000785	9.84374E-07	2.95347E-11	9.85E-07		
2030	San Diego (SD)	UBUS	296.9925	0.199621	0.486036	150269.2	0.001976	1.33E-06	0.001677	3.31377E-06	2.22732E-09	3.38E-06		
2030	San Diego (SD)	OBUS	256.3712	0.002401	0.231852	173091.91	0.001481	1.39E-08	0.001931	2.86053E-06	2.67851E-11	2.86E-06		
2040	San Diego (SD)	LDA	11544.55	0.314455	2.944549	58997047	0.000196	5.33E-09	0.617015	0.000120738	3.2887E-09	0.000121		
2040	San Diego (SD)	LDT1	879.8204	0.009317	0.123097	3458612.8	0.000254	2.69E-09	0.036172	9.20152E-06	9.74414E-11	9.2E-06		
2040	San Diego (SD)	LDT2	3979.219	0.041999	0.555261	16872616	0.000236	2.49E-09	0.176461	4.16163E-05	4.39244E-10	4.16E-05		
2040	San Diego (SD)	MDV	2604.714	0.03245	0.429289	9246079.5	0.000282	3.51E-09	0.096699	2.72412E-05	3.39377E-10	2.73E-05		
2040	San Diego (SD)	MH	84.54032	0.000358	0.050134	65284.503	0.001295	5.49E-09	0.000683	8.84157E-07	3.7458E-12	8.84E-07		
2040	San Diego (SD)	MCY	115.7669	0.317682	0.722744	528802.79	0.000219	6.01E-07	0.00553	1.21074E-06	3.32244E-09	1.3E-06		
2040	San Diego (SD)	LHDT1	715.5173	0.009348	0.462457	1054635.8	0.000678	8.86E-09	0.01103	7.48317E-06	9.77673E-11	7.49E-06	0.000293	0.266
2040	San Diego (SD)	LHDT2	376.5984	0.003589	0.098506	505721.44	0.000745	7.1E-09	0.005289	3.93862E-06	3.75309E-11	3.94E-06		
2040	San Diego (SD)	MHDT	2375.891	0.008607	3.153	1831298.6	0.001297	4.7E-09	0.019152	2.4848E-05	9.00157E-11	2.49E-05		
2040	San Diego (SD)	HHDT	4617.406	0.418893	5.457027	2638122.8	0.00175	1.59E-07	0.027591	4.82907E-05	4.38095E-09	4.84E-05		
2040	San Diego (SD)	SBUS	92.76965	0.003178	0.130251	77481.245	0.001197	4.1E-08	0.00081	9.70222E-07	3.32379E-11	9.71E-07		
2040	San Diego (SD)	UBUS	290.9889	0.161633	0.176078	153135.42	0.0019	1.06E-06	0.001602	3.04328E-06	1.69042E-09	3.09E-06		
2040	San Diego (SD)	OBUS	275.7658	0.002444	0.225614	188049.57	0.001466	1.3E-08	0.001967	2.88407E-06	2.55551E-11	2.88E-06		
2050	San Diego (SD)	LDA	11960.23	0.327679	3.044997	61929442	0.000193	5.29E-09	0.615011	0.000118775	3.25413E-09	0.000119		
2050	San Diego (SD)	LDT1	884.3905	0.00728	0.101424	3620948.4	0.000244	2.01E-09	0.035959	8.78274E-06	7.22937E-11	8.78E-06		
2050	San Diego (SD)	LDT2	4051.499	0.039856	0.527582	17695838	0.000229	2.25E-09	0.175734	4.02348E-05	3.95799E-10	4.02E-05		
2050	San Diego (SD)	MDV	2505.97	0.023533	0.305284	9672644.5	0.000259	2.43E-09	0.096057	2.48864E-05	2.33703E-10	2.49E-05		
2050	San Diego (SD)	MH	86.62282	0.000323	0.046498	67231.832	0.001288	4.8E-09	0.000668	8.60237E-07	3.2034E-12	8.6E-07		
2050	San Diego (SD)	MCY	121.5646	0.333588	0.758513	554061.22	0.000219	6.02E-07	0.005502	1.20724E-06	3.3128E-09	1.3E-06		
2050	San Diego (SD)	LHDT1	726.9445	0.008005	0.227951	1086771.3	0.000669	7.37E-09	0.010793	7.21917E-06	7.94951E-11	7.22E-06	0.000292	0.265
2050	San Diego (SD)	LHDT2	396.5753	0.003727	0.090429	533647.07	0.000743	6.98E-09	0.0053	3.93832E-06	3.70093E-11	3.94E-06		
2050	San Diego (SD)	MHDT	2695.998	0.009494	3.607898	2082167.6	0.001295	4.56E-09	0.020678	2.67735E-05	9.42829E-11	2.68E-05		
2050	San Diego (SD)	HHDT	5249.505	0.456047	6.060598	3009899.6	0.001744	1.52E-07	0.029891	5.2132E-05	4.52893E-09	5.23E-05		
2050	San Diego (SD)	SBUS	95.03437	0.003555	0.133157	80441.421	0.001181	4.42E-08	0.000799	9.43771E-07	3.53026E-11	9.45E-07		
2050	San Diego (SD)	UBUS	301.8606	0.14284	0.085201	160426.31	0.001882	8.9E-07	0.001593	2.99773E-06	1.41852E-09	3.04E-06		
2050	San Diego (SD)	OBUS	298.1652	0.002547	0.245955	202935.98	0.001469	1.26E-08	0.002015	2.96103E-06	2.52971E-11	2.96E-06		

ATTACHMENT 2

Reduction Measure Quantification

Parameters

Energy Measures

E1 Renewable Energy Procurement

Energy Reduction calculated outside of ClearPath

2030 RPS Mandate	50%	
2030 Local Procurement Goal	75%	
Overall Reduction	50%	
Procurement Goal Milestones	50%	renewable by 2025
	55%	renewable by 2026
	60%	renewable by 2027
	65%	renewable by 2028
	70%	renewable by 2029
	75%	renewable by 2030
Reduction per Year	10%	per year (2025-2030)

E2 Solar Photovoltaic Program

Solar Capacity installed per year calculated outside of ClearPath

BAU Growth Indicator		
2013 Commercial Jobs	30,030	jobs
2018 Commercial Jobs	32,852	jobs
2035 Commercial Jobs	51,637	jobs
2050 Commercial Jobs	76,958	jobs
2013 Industrial Jobs	6,002	jobs
2018 Industrial Jobs	7,211	jobs
2035 Industrial Jobs	12,380	jobs
2050 Industrial Jobs	19,945	jobs
Commercial Growth		
2013 Commercial Electricity Use	326,127,182	kWh
2018 Commercial Electricity Use	356,779,673	kWh
2035 Commercial Electricity Use	560,787,245	kWh
2050 Commercial Electricity Use	835,777,165	kWh
New Commercial Electricity (2018-2035)	204,007,572	kWh
50 Percent Offset	102,003,786	kWh
Annualized Offset Generation	6,000,223	kWh
Solar Generation Capacity	1,704	kWh/kW installed
Solar Panel Capacity (2018-2035)	3,521	kW
New Commercial Electricity (2035-2050)	274,989,920	kWh
50 Percent Offset	137,494,960	kWh
Annualized Offset Generation	8,087,939	kWh
Solar Generation Capacity	1,704	kWh/kW installed
Solar Panel Capacity (2035-2050)	4,746	kW
Industrial Growth		
2013 Industrial Electricity Use	105,803,463	kWh
2018 Industrial Electricity Use	127,109,863	kWh
2035 Industrial Electricity Use	218,221,826	kWh
2050 Industrial Electricity Use	351,562,972	kWh

New Industrial Electricity (2018-2035)	91,111,963	kWh
50 Percent Offset	45,555,981	kWh
Annualized Offset Generation	2,679,764	kWh
Solar Generation Capacity	1,704	kWh/kW installed
Solar Panel Capacity (2018-2035)	1,573	kW

New Industrial Electricity (2035-2050)	133,341,146	kWh
50 Percent Offset	66,670,573	kWh
Annualized Offset Generation	3,921,798	kWh
Solar Generation Capacity	1,704	kWh/kW installed
Solar Panel Capacity (2035-2050)	2,302	kW

E3 Residential Energy Conservation and Disclosure

Not Quantified

E4 Promotion of Low-Income Financing Programs

Not Quantified

E5 Non-Residential Building Energy Benchmarking and Disclosure

Not Quantified

Water and Wastewater Measures

W1 Implementation of the Water Conservation Master Plan

Energy Reduction from reduced water use calculated outside of ClearPath

Water Use Projections (acre-feet)	2020	2025	2030	2035	2040
Demand	32,641	34,479	34,976	35,263	35,641
Demand with Program B	31,728	32,915	32,813	33,190	33,537
Reduction	913	1,564	2,163	2,073	2,104

Reduction	2,104	acre-feet
2013 Imported Water	7,773	million gallons
2013 Electricity for Water Import	80,924,703	kWh
Import Intensity	10,411	kWh/million gallons
2013 Distributed Water	9,388	million gallons
2013 Electricity for Water Distribution	2,741,208	kWh
Distribution Intensity	292	kWh/million gallons
Total Electricity for Water Delivered	10,703	kWh/million gallons
Reduction	686	million gallons
Reduction	7,337,869	kWh
Reduction	25,019	MMBtu
Reduction Per Year	1,088	MMBtu/Year

W2 Non-Residential Water Use Benchmarking and Disclosure

Measure not quantified

Quanitification of Measures

W3 Local Water Supply Development

Energy Reduction from reduced water use calculated outside of ClearPath

Target Recycled Water 2025	3.0	million gallons per day
Recycled Water 2017	0.7	million gallons per day
Reduction in Potable Water Supply	2.3	million gallons per day
	840	million gallons per year
2013 Imported Water	7,773	million gallons
2013 Electricity for Water Import	80,924,703	kWh
Import Intensity	10,411	kWh/million gallons
Total Electricity Demand Avoided	8,740,035	kWh per year
Reduction	29,799	MMBtu/Year
Target Recycled Water 2035	5.5	million gallons per day
Recycled Water 2025	3.0	million gallons per day
Reduction in Potable Water Supply	2.5	million gallons per day
	913	million gallons per year
Total Electricity Demand Avoided	9,500,038	kWh per year
Reduction	32,390	MMBtu/Year
Target Recycled Water 2045	7.5	million gallons per day
Recycled Water 2035	5.5	million gallons per day
Reduction in Potable Water Supply	2.0	million gallons per day
	730	million gallons per year
Total Electricity Demand Avoided	7,600,030	kWh per year
Reduction	25,912	MMBtu/Year

Solid Waste Measures

SW1 Implementation of Zero Waste Strategic Resource Plan

Calculated entirely outside ClearPath - ClearPath does not contain a module for calclating solid waste reduction

2013 Solid Waste Emissions	41,498	MT CO_2E
Waste Growth Indicator	Population	
2020 ABAU Forecasted Emissions	42,614	MT CO_2E
2035 ABAU Forecasted Emissions	44,757	MT CO_2E
2013 Diversion Rate	67%	
2020 Target Diversion Rate	75%	
Increased Waste Diversion	24%	
2020 Emissions Reduction	10,331	MT CO_2E
2020 Reduced Emissions	32,283	MT CO_2E
Annual Incremental Emission Reduction (2013-2020)	1,476	MT CO_2E

SW2 Beyond 2020 - Enhanced Waste Diversion

Calculated entirely outside ClearPath - ClearPath does not contain a module for calclating solid waste reduction

2020 Target Diversion Rate	75%	
2035 CAP Target Diversion Rate	90%	
Increased Waste Diversion	60%	
2035 Emissions Reduction	26,854	MT CO_2E
2035 Reduced Emissions	17,903	MT CO_2E
Annual Incremental Emission Reduction (2020-2035)	1,102	MT CO_2E

Quanitification of Measures

Transportation and Land Use Measures

TL1 Smarth Growth Policies

VMT Reduction calculated outside of ClearPath

Sources: Smart Growth Reduction - http://www.sandag.org/uploads/publicationid/publicationid_1500_11604.pdf

2018 Single Family Housing	42,795	dwelling units		
2018 Multi Family Housing	21,065	dwelling units		
2018 Mobile Home Housing	3,354	dwelling units		
2018 Total Housing	67,213	dwelling units		41,742
2030 Single Family Housing	43,240	dwelling units	43,363	
2030 Multi Family Housing	22,968	dwelling units	23,729	
2030 Mobile Home Housing	3,303	dwelling units	3,303	
2030 Total Housing	69,511	dwelling units	70,395	66,184
New Single Family Housing 2018-2030	446	dwelling units	568	
New Multi Family Housing 2018-2030	1,903	dwelling units	2,664	
New Mobile Home Housing 2018-2030	0	dwelling units	-51	
Total New Housing 2018-2030	2,349	dwelling units	3,182	24,442
Target SGOA Development Rate	50.0%		2,007	16,412
Non-SGOA Housing	1,174	dwelling units		
SGOA Housing	1,174	dwelling units		
Annual VMT of Each Unit	26,974	miles/unit	*CalEEMod Outpu	21170
Trip Reduction from Smart Growth	24.0%			
Overall VMT Reduction (2017-2030)	7,603,285	VMT		
Annual VMT Reduction	633,607	VMT		

T2 Electric Vehicle Promotion

Sources: Comparison Electricity Sources and Annual Vehicle Emissions California - https://www.afdc.energy.gov/vehicles/electric_emissions.ph

2013 Community VMT	1,014,698,962	miles
2030 Community VMT	1,118,974,444	miles
2030 EMFAC regional LDA VMT	61.6%	
2030 Community LDA VMT	689,288,257	miles
Alternative Fuels Data Center Data		
Gasoline Car Emissions	11,435	lbs CO_2E/year
All Electric Car Emissions	4,587	lbs CO_2E/year
Annual Mileage	11,824	miles/year
Gasoline Car Emissions	0.439	MT CO_2E/thousand miles
All Electric Car Emissions	0.176	MT CO_2E/thousand miles
Reduction, EV vs Gasoline	59.9%	reduced VMT
Statewide Target	14.1%	by 2030
Community Target EV Share	20.0%	by 2030
Increased ZEV use	5.9%	by 2030
Reduced VMT	16,313,437	miles
Reduction per Year (2018-2030)	1,254,880	miles per year

T3 Preferential Parking Spaces for Clean Air Vehicles

Measure not quantified

T4 Expand Complete Streets Program

Measure not quantified

T5 Transportation Demand Management Programs

VMT Reduction calculated outside of ClearPath

County Average Trip Length From SANDAG Series 12 Traffic Forecast

2018 Total Employment	41,742	jobs
2030 Total Employment	57,793	jobs
New Developmennt Employment	16,051	jobs
County Average Trip Length	5.8	miles
Roundtrip Average Commute	11.6	miles
New Job Commute Miles	67,960,145	miles
VMT Reduction	10%	
VMT Reduction	6,796,015	miles
VMT Reduction	566,335	miles/year

Carbon Capture And Storage Measures

AF1 Urban Forestry Program

Calculated entirely outside ClearPath - ClearPath does not contain a module for calclating urban forestry

https://www.fs.fed.us/psw/topics/urban_forestry/products/cufr47_SMonicaBCA.pdf

Average Annual Sequestration	63	kg CO_2 per tree
Average Annual Sequestration	0.063	MT CO_2E/tree
Annual Right of Way Trees Planted	200	trees
Annual Incremental Reduction	12.6	MT CO_2E/year
Annual Reductions by 2035	163.8	MT CO_2E/year
Annual Private Development Trees	200	trees
Annual Incremental Reduction	12.6	MT CO_2E/year
Annual Reductions by 2035	163.8	MT CO_2E/year
Reductions by 2020	50	MT CO_2E
Reductions by 2030	302	MT CO_2E
Reductions by 2040	554	MT CO_2E
Reductions by 2049	781	MT CO_2E

AF2 Urban Agriculture and Community Gardens

Measure not quantified

AF3 Agricultural Lands Conservation Program

Calculated VMT Reduction outside ClearPath

Initial Implementation (2020-2024)			
Easements	250	acres	
Residential Development Intensity	3.6	du/acre	
Agricultural Zoning Intensity	0.4	du/acre	
Rights Extinguished	3.2	du/acre	
Precluded Residences	800	units	
Annual VMT Reduction	26,974	miles/unit	*CalEEMod Output per SALC Guidelines
Total Reduction (30-year)	21,579,200	miles	
Reduction per Year (2020-2024)	4,315,840	miles	
Secondary Implemenation (2025-2029)			
Easements	250	acres	
Total Reduction (30-year)	21,579,200	miles	
Reduction per Year (2025-2029)	4,315,840	miles	

AF4 Carbon Farms Program

Measure not quantified

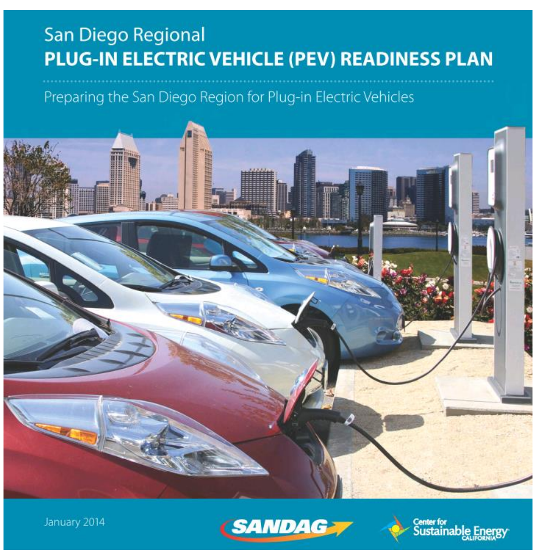
APPENDIX A.2

REGIONAL EMISSIONS REDUCTION EFFORTS

A.2 Reducing Regional Emissions from Transportation

As illustrated in the regional GHG inventory, the transportation sector, including both light-duty and heavy-duty vehicles, represents the largest source of GHG emissions in the San Diego Region. The 2017 Scoping Plan outlines four goal areas for reducing emissions from the transportation sector:

1. Vibrant communities and landscapes/VMT reduction;
2. Vehicle technology;
3. Clean fuels;
4. Sustainable freight.



SANDAG supports the State's strategies for ZEVs and low-carbon fuels in the region. Since 2012, SANDAG has provided a forum for local governments and other regional stakeholders to address barriers to deploying alternative fuel vehicles and siting charging and fueling stations. In 2014, SANDAG completed a regional readiness plan for plug-in EVs and charging stations. This effort was expanded to planning for all alternative fuels, with a regional alternative fuel plan completed in 2016. With funding from the California Energy Commission, SANDAG is implementing the readiness plan for EVs by providing technical assistance to property owners and other potential EV-charging station hosts and performing a regional needs assessment for publicly available EV charging through a program called "Plug-in SD." As part of the 2015 Regional Plan, SANDAG also adopted a measure to allocate $30 million for an incentive program for EV-charging infrastructure.

Local governments have the ability to influence transportation-related GHG emissions through the land use authority, community investments, and municipal operations. In local CAPs, local governments have identified measures to reduce VMT and promote efficient vehicles and alternative fuel use in government operations and throughout the community. Although emissions from government operations make up a small percentage of a jurisdiction's overall emissions, the local government can help to influence changes in the community by taking steps to reduce internal emissions. In developing a CAP, local jurisdictions can set local goals for VMT reduction and/or increased biking, walking, and transit mode share. While local VMT reduction goals are furthered by regional transportation projects, they often cannot be fully realized without local measures. Some of these local measures include:

- A local active transportation plan;
- Local incentives for biking, walking, and transit use;
- Parking demand management; and
- Updating of land-use plans to facilitate smart growth and VMT reduction;
- Local CAPs can consider ways to increase the use of ZEVs in the community through investments in EV charging, requiring EV-ready buildings, and/or incentives for installing EV charging at homes and businesses.

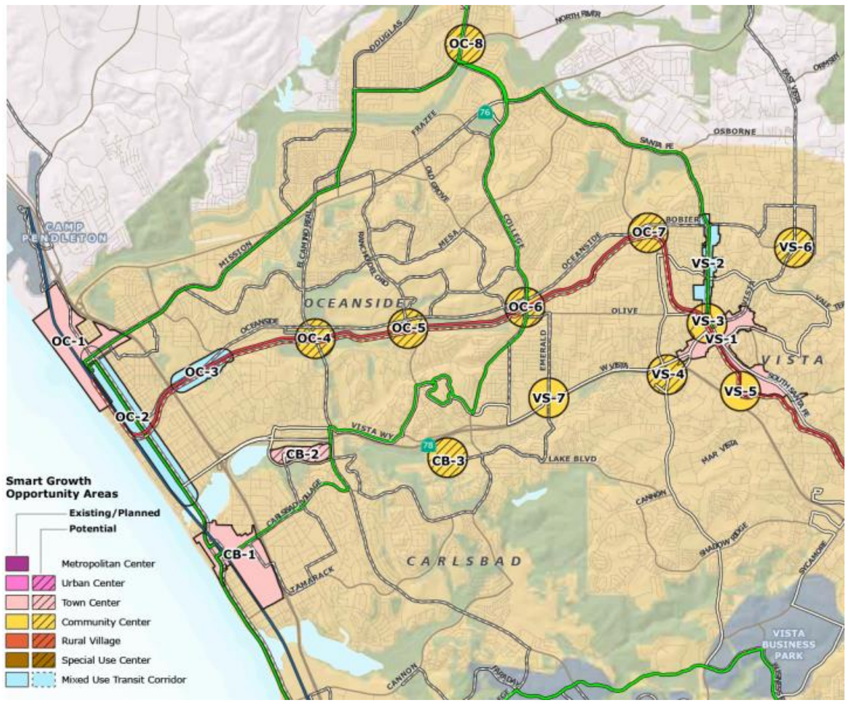
A.2.1 Reducing Regional Emissions from Land Use

Land use decisions impact nearly all sources of GHG emissions. Smart growth development brings people closer to more destinations and supports low-carbon travel choices (i.e., public transit, carpooling, walking, and biking). Mixed-use, compact developments also result in reduced per-capita demand for lighting, heating, and cooling. There are also co-benefits of land use and transportation strategies beyond GHG reductions, including: preservation of agricultural land, open space, and habitat; improved water quality from reduced development-related pollutant sources; positive health effects; and the reduction of smog-forming pollutants. Land use strategies also include efforts to expand tree planting and other urban greening efforts, which increase carbon sequestration. As described in the "Climate Change in the 2015 Regional Plan" section, the SCS in the 2015 Regional Plan consists of land-use patterns and transportation investments that together achieve the region's S8 375 GHG reduction targets.

SANDAG also provides incentives to encourage smart growth development and preserve habitat lands. Through the *TransNet* Smart Growth Incentive Program, SANDAG provides grants to member agencies to support planning and capital projects in areas on the Smart Growth Concept Map (Figure 20), which illustrates the location of existing, planned, and potential smart growth areas. In addition, through the *TransNet* Environmental Mitigation Program (EMP) Land

Acquisition Grant Program, over 5,000 acres of property have been acquired and conserved as open space areas in the region. These grant programs help to incentivize compact development and maintenance of open space, resulting in reduced GHG emissions.

Regional Smart Growth Concept Map (Coastal North County)



Source: San Diego Association of Governments (SANDAG)

The Smart Growth Concept Map shows eight Smart Growth Opportunity Areas (SGOA) in Oceanside, most of which lie along the City's rail lines. The entire length of Coast Highway is a designated SGOA, as is the City's downtown area. Local governments have the authority to decide how and where land is developed to accommodate population and economic growth. Over the past 15 years, local plans have been updated to concentrate growth within the urbanized areas of the region, closer to existing and planned transportation infrastructure, while increasing land area dedicated to open space and habitat preservation. These land use changes help implement the vision and goals set in the Regional Plan and are reflected in the SANDAG SCS, collectively moving the region toward more compact development, open-space preservation, and reduced GHG emissions.

A.2.2 Reducing Regional Emissions from Electricity Use

Electricity use is responsible for approximately 23 percent of the San Diego region's GHG emissions as of 2012. Even prior to climate change policy, California has long been a leader in improving building energy efficiency and promoting the use of renewable energy sources. California's per-capita energy consumption is among the lowest in the country and has remained relatively constant since 1974. This has been achieved through building codes and appliance standards, incentive programs, design and installation training, and public outreach. In 1996, the State began incentivizing customer-side renewable energy technologies, and in 2002 it established the first Renewables Portfolio Standard (RPS) for the investor-owned utilities. In order to achieve energy and climate goals, California households and businesses will need to play a part. The key strategies to reduce GHG emissions from electricity are consistent with the state's loading order, and include:

- Conservation and energy efficiency in new and existing buildings;
- Low carbon distributed generation; and
- Large-scale renewable energy sources.

While state agencies have significant authority over electricity programs, SANDAG focuses on opportunities that SANDAG and its member agencies could take advantage of to influence electricity savings and GHG reductions in the region. SANDAG does this through coordinated planning with a variety of stakeholders through the Regional Energy Working Group and provision of resources to member agencies through a Local Government Partnership (LGP) with SDG&E. The SANDAG Regional Energy Strategy (RES) outlines several goals that support the state's efforts to reduce electricity-related GHG emissions while considering other factors such as cost effectiveness and impacts to the power grid. Three of the six Priority Early Actions (PEA) from the RES are related to electricity:

- Pursue a comprehensive building retrofit program to improve efficiency and install renewable energy systems;
- Create financing programs to pay for projects and improvements that save energy; and
- Utilize the SANDAG-SDG&E LGP to help local governments identify opportunities and implement energy savings at government facilities and throughout their communities.

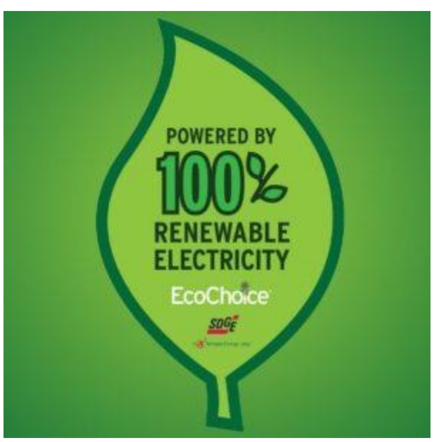
The SANDAG LGP Energy Roadmap Program is one component of SDG&E's portfolio of energy efficiency programs. Through the Energy Roadmap Program, SANDAG prepared custom energy management plans for the 16 member agencies that do not have an LGP. In 2016, SANDAG and SDG&E expanded the Energy Roadmap Program into two service areas: energy engineering and climate planning.

Energy engineering services include:

- Energy audits of municipal facilities;
- Project management support for energy efficiency retrofits;
- Technical support and procurement assistance;
- Training and recognition;
- Project analysis and recommendations and/or feasibility studies; and
- Performance monitoring.

Climate planning services include:

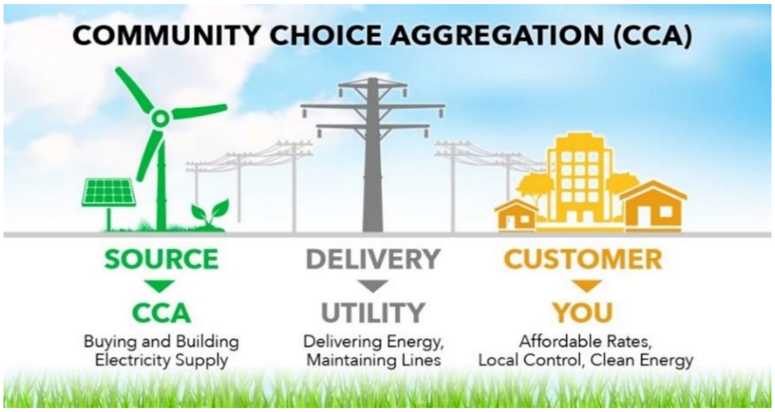
- GHG inventories and projections;
- Monitoring reports;
- CAP development;
- CAP implementation assistance;
- Reduction measure calculations and analyses;
- Benefit-cost analysis;
- Implementation cost assessments;
- CEQA assistance; and
- Trainings



SDG&E's EcoChoice program allows customers to choose 100% renewable electrical power

Local CAPs recognize the role that energy efficiency and renewable energy play in reaching GHG reduction goals. The state's Comprehensive Energy Efficiency Program for Existing Buildings (ECEE) includes a specific strategy related to Local Government Leadership and introduces the CEC's Local Government Challenge program that provides funding for energy efficiency programs that advance goals in adopted climate or energy action plans. The ECEE Action Plan describes other programs and opportunities for local governments to demonstrate leadership, including LGPs, the Cool California City Challenge, voluntary reach standards, building energy saving ordinances, and climate action planning.

Several CAPs in the San Diego region have set a goal for 100 percent renewable electricity to be achieved through a partnership with SDG&E, Community Choice Aggregation (CCA), or another similar program. CCA, authorized under Assembly Bill 117 (Migden, 2002), allows local governments to offer electricity procurement service to customers within their jurisdictional boundaries. In communities with CCA, the incumbent utility continues its role with transmission and distribution, metering, and billing for customers. The CCA only is involved in the electrical generation decision-making. Across the state, there are currently nine operational CCAs with several more cities and counties exploring and/or pursuing CCA. In the San Diego region, the City of Solana Beach completed a CCA technical study and is moving forward with program development and launch. Other jurisdictions exploring CCA include Carlsbad, Del Mar, Encinitas, and San Diego.



CCA is one option available to the City as a means of sourcing more renewable electricity and generating revenue for local sustainability efforts.

A.2.3 Reducing Emissions from Natural Gas End Use

Natural gas end uses account for eight percent of GHG emissions in the San Diego region, the third largest source after transportation and electricity. These emissions primarily come from natural gas combustion for hot water, space heating, cooling, cooking, and other uses in residential and commercial buildings. GHG emissions associated with power generation from natural gas power plants are accounted for in the electricity sector data. Through the Energy Roadmap Program, SANDAG works with local governments to identify strategies to reduce natural gas use in their own facilities and in the community. For reducing emissions from natural gas end-uses, strategies are similar to those described above for electricity efficiency. Measures from local CAPs include revising building codes to require energy audits and/or retrofits, offering financing and incentive programs, increasing use of solar hot water heating, and switching various natural gas end uses to electricity.

Example of a full electrification of an Oceanside home, which was featured at the American Solar Energy Society (ASES) annual meeting in October of 2017

A.2.4 Reducing Regional Emissions from the Water Sector

Emissions generated from water use are primarily accounted for in the electricity and natural gas sectors of the regional GHG inventory resulting from electricity used for transport, distribution, treatment, pumping of water, and natural gas used for heating water. One percent of the region's overall emissions come from emissions associated with the conveyance of water from outside sources to the San Diego region. Because of the close relationship between energy and water, strategies that save water generally save energy as well. This is especially true for the San Diego region since most of the region's water is imported from either the Colorado River or northern California via the State Water Project. Both sources require large amounts of energy to transport the water across long distances.

Xeriscape is one way to reduce both maintenance and irrigation needs. Many water districts in California provide financial incentives for the replacement of turf with drought-tolerant groundcover and shrubs

The SDCWA is the agency responsible for ensuring reliable supplies of water to the San Diego region. SANDAG coordinates with SDCWA to ensure consistency among various regional planning efforts. Through the Energy Roadmap Program, SANDAG also provides resources to local governments on the water-energy nexus and ways to save water and energy, including incorporating water conservation measures into local CAPs. In addition, the San Diego region has an Integrated Regional Water Management (IRWM) plan that outlines how the region will develop long-term water supply reliability, improve water quality, and protect natural resources.

Local governments can leverage their authority and encourage residents and businesses to conserve water by adopting building codes and landscape ordinances that increase water efficiency, coordinating with the local water district and/or SDCWA on programs and incentives available to residents and businesses, and demonstrating leadership by saving water in municipal facilities. Some jurisdictions already require residents to update water fixtures to low-flow models at point of sale or during building renovations.

A.2.5 Reducing Regional Emissions from Solid Waste

Solid waste contributes five percent to the San Diego region's total GHG emissions. This reflects methane emissions at landfills and wastewater treatment. The State has a goal (set by Assembly Bill 341 in 2011) for diverting 75 percent of waste from landfills (through recycling, composting, or source reduction) by the year 2020 and capturing methane from landfills to further reduce GHG emissions. Assembly Bill 1826, passed in 2014, requires businesses that generate a specific amount of organic waste per week to arrange for recycling services for that waste, according to a tiered implementation schedule; in 2016, local governments were required to implement an organic waste recycling program to divert organic waste generated by businesses and multi-family residential dwellings. SB 1383 of 2016 requires methane emissions at landfills to be reduced by reducing landfill disposal of organic waste 75 percent below 2014 levels by 2025.

The City of Oceanside has embraced the zero waste concept through sustainable procurement practices, public education, plastic straw and bag bans, and support for local composting operations

Local governments can adopt codes and standards that increase construction waste diversion, recycling, zero-waste or green-waste programs, and composting. Many local governments have contracted waste services for their jurisdiction and can work with the waste service provider on strategies to reduce GHG emissions. Local governments that operate landfills can work to use captured methane for cogeneration or other applications. The concept of "zero waste" has been embraced by many jurisdictions in the San Diego region, including the City of Oceanside. Zero waste efforts involve resource-efficient design, sustainable procurement practices, reusable materials, recycling, composting, and the conversion of waste to energy.

The City of Oceanside is situated within one of the most livable areas of the country. Preserving and enhancing the area's livability requires a concerted regional effort, in which the City can play an important role. In turn, the City can avail itself of a variety of regional resources that support climate action and other sustainability efforts.

APPENDIX A.3

MC^3 CO-BENEFIT MODELS

A.3 MC3 CO-BENEFITS MODELS

As part of the MC^3 project, a series of systems models that each center on a particular area of climate action were developed. Together, these models provide a comprehensive impression of the advantages and disadvantages associated with different plans and strategies. In turn, this insight can be used to inform integrated community planning and decision-making. The following tables and figures reveal the linkages between specific climate action strategies and other key concerns.

CO-BENEFITS MODELS	
Energy Innovation	Climate mitigation strategies focused on transitioning from fossil fuels to green energy sources (e.g., renewable energy, district energy)
Densification	Climate mitigation experienced through efficiencies experienced with transportation and residential energy usage in areas of urban density.
Mixed-Use and Downtown Revitalization	Climate mitigation experienced through encouraging active transportation (similar to urban densification, but refers to composition rather than concentration).
Buildings	Mitigation through reduced energy consumption associated with green building and retrofitting strategies.
Ecological Capital	Climate mitigation benefits received from carbon sequestration, and climate adaptation benefits associated with flood control and temperature regulation.
Trails and Transportation	Climate mitigation strategies centered on reducing vehicle traffic.
Waste and Water	Mitigation benefits related to waste diversion, and adaptation strategies such as stormwater and flood management.

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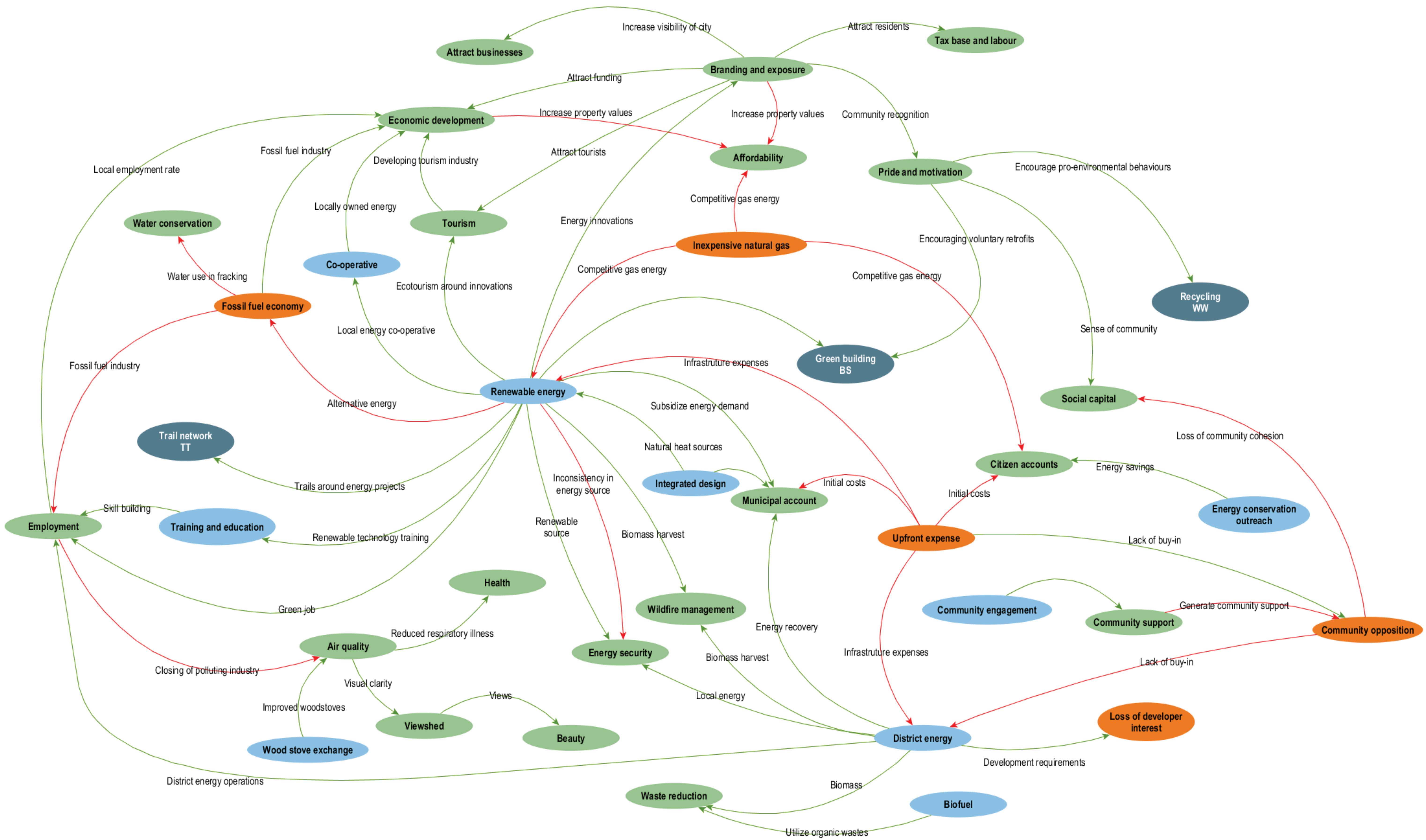
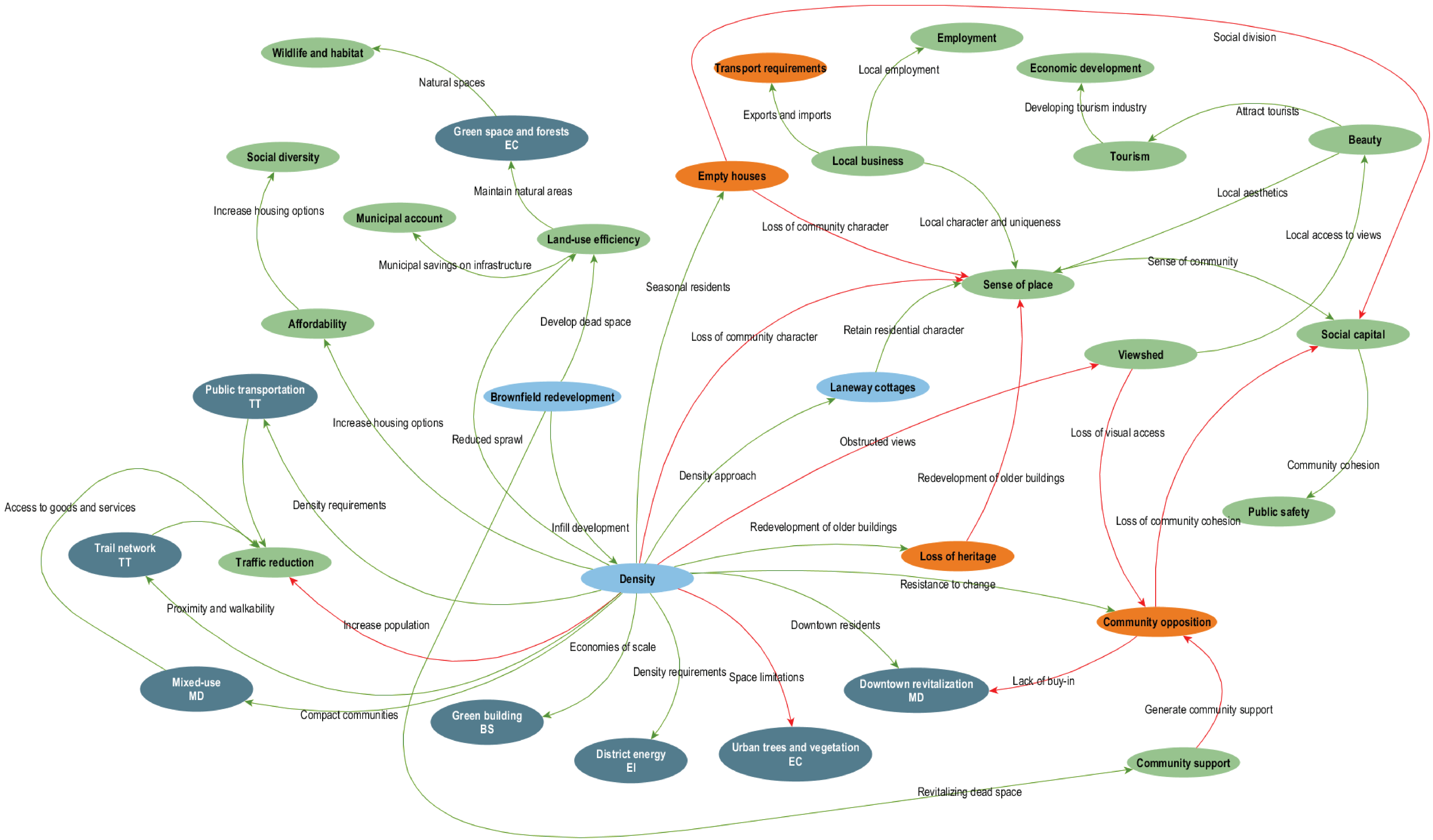
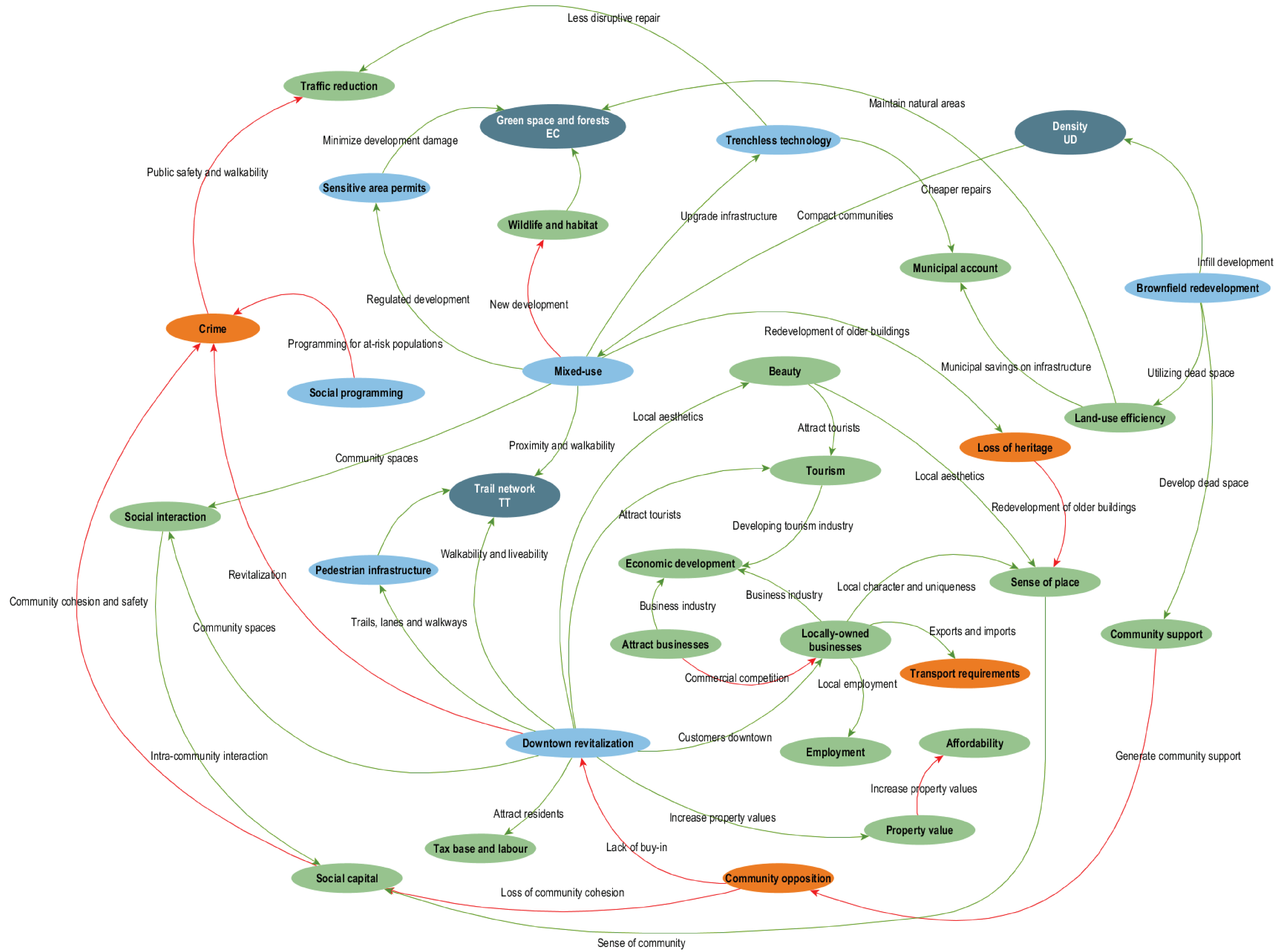


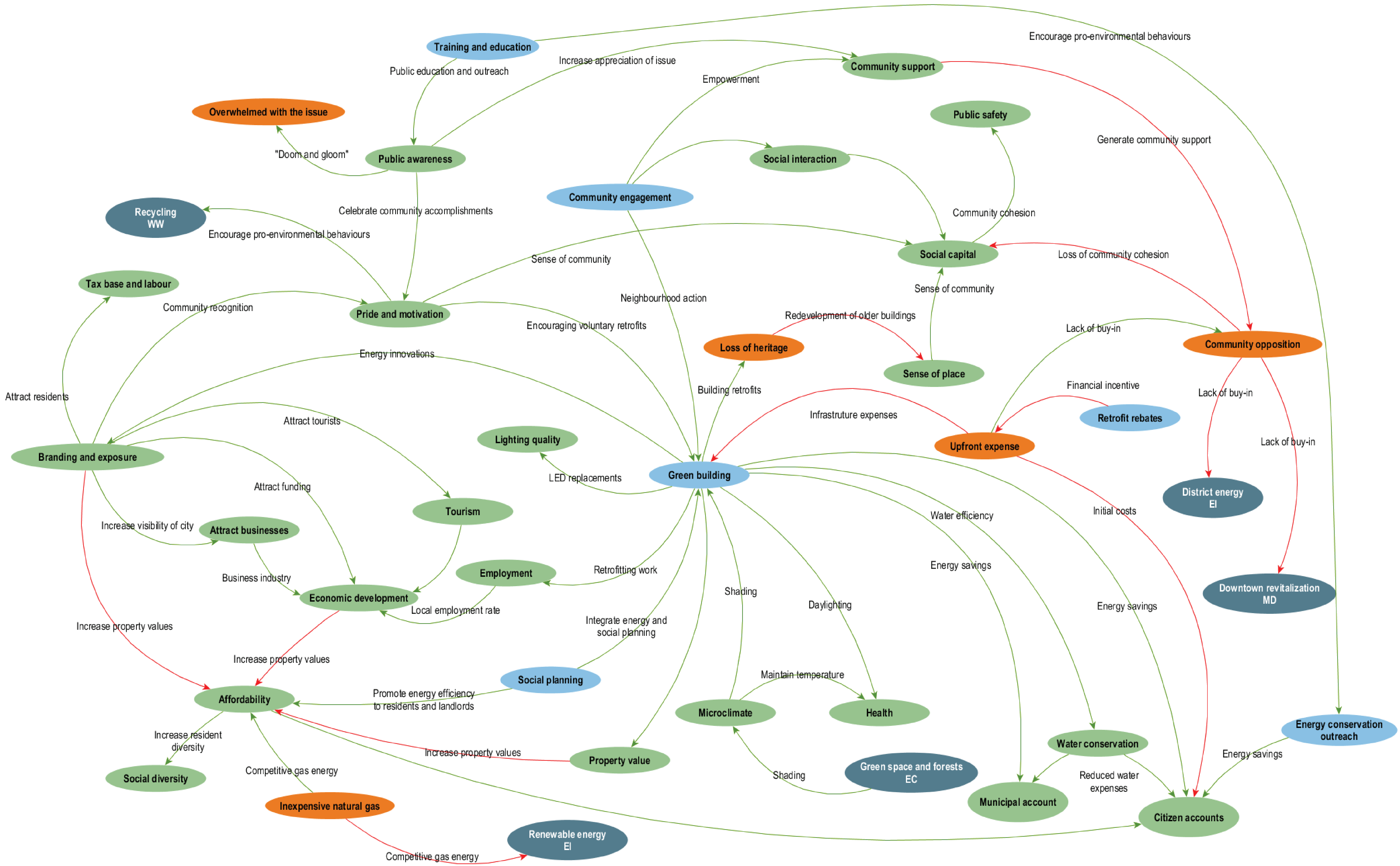
Inter-relationships between Renewable Energy Initiatives and Other Priorities



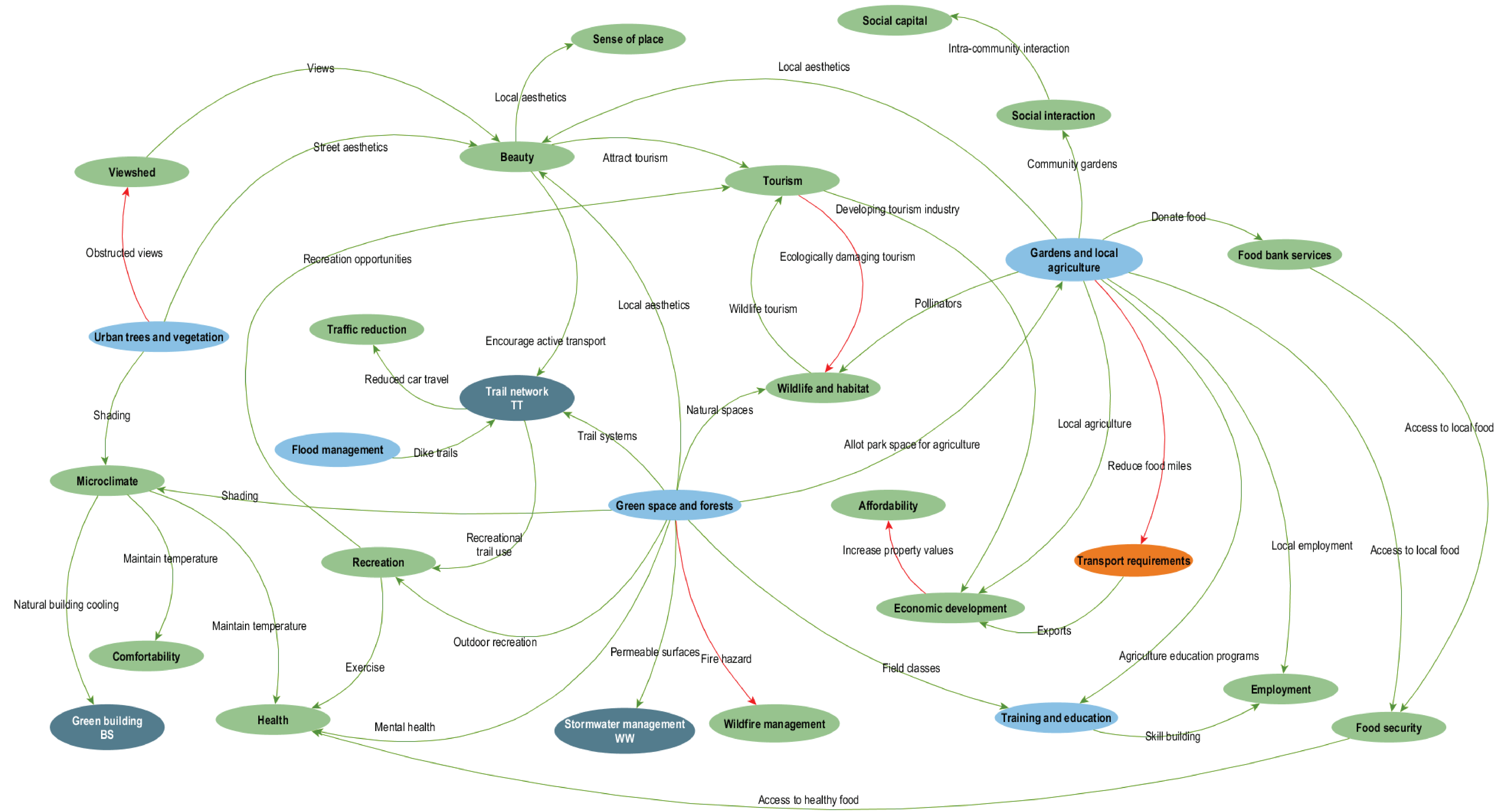
Inter-relationships between Densification Initiatives and Other Priorities



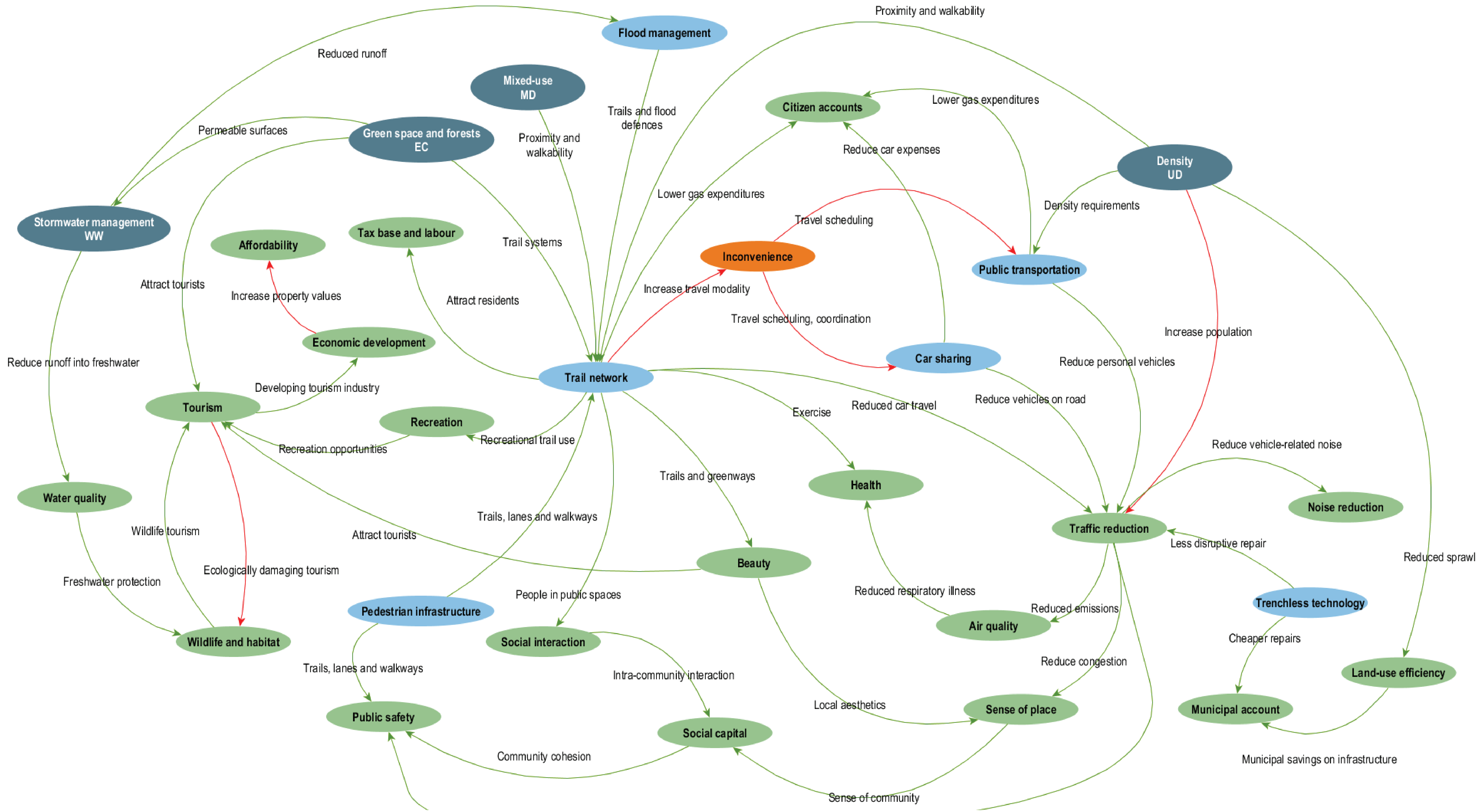
Inter-relationships between Mixed-Use and Downtown Revitalization Initiatives and Other Priorities



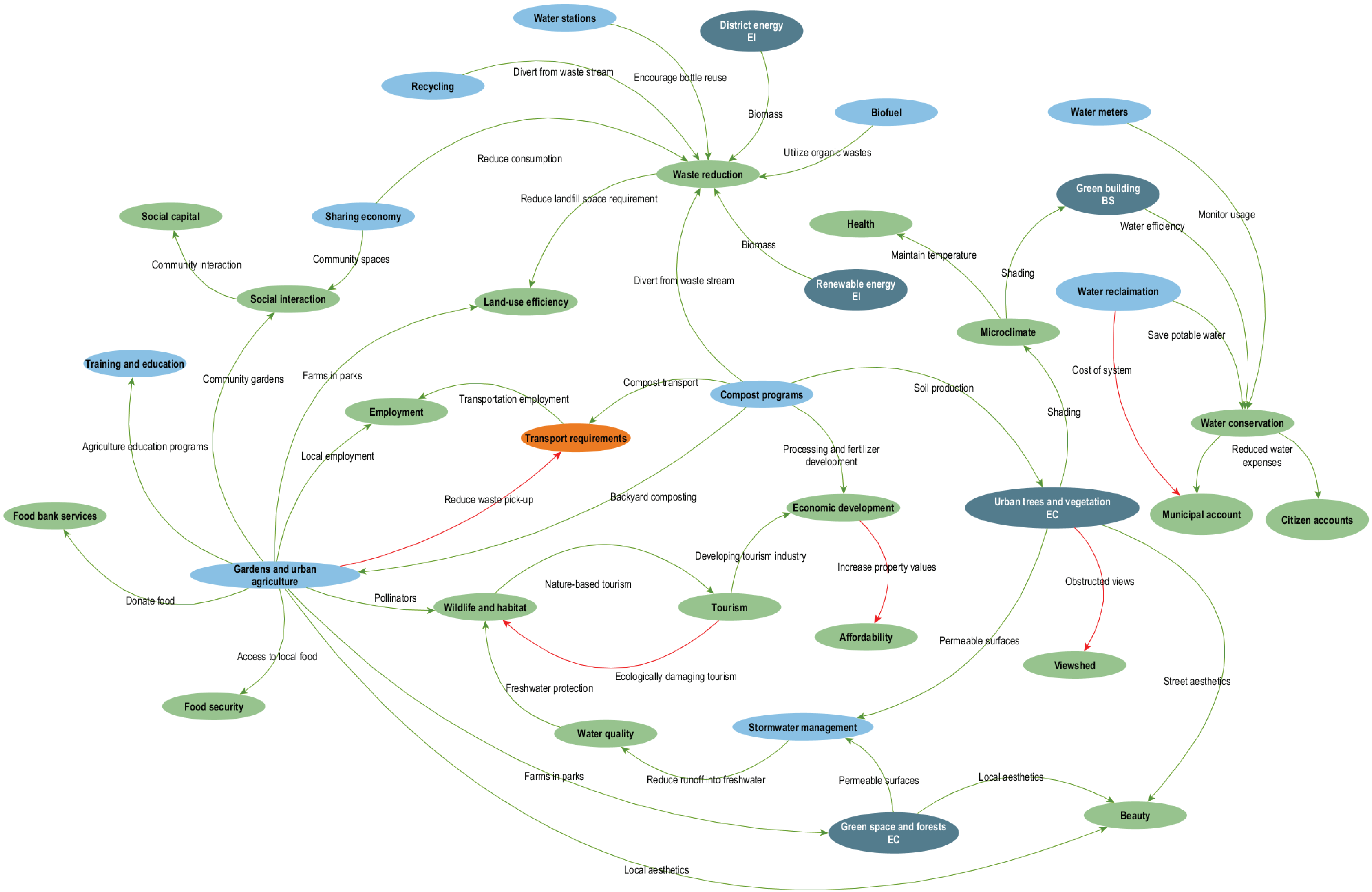
Inter-relationships between Building Initiatives and Other Priorities



Inter-relationships between Ecological Capital Initiatives and Other Priorities



Inter-relationships between Trails and Transportation Initiatives and Other Priorities



Inter-relationships between Waste and Water Initiatives and Other Priorities