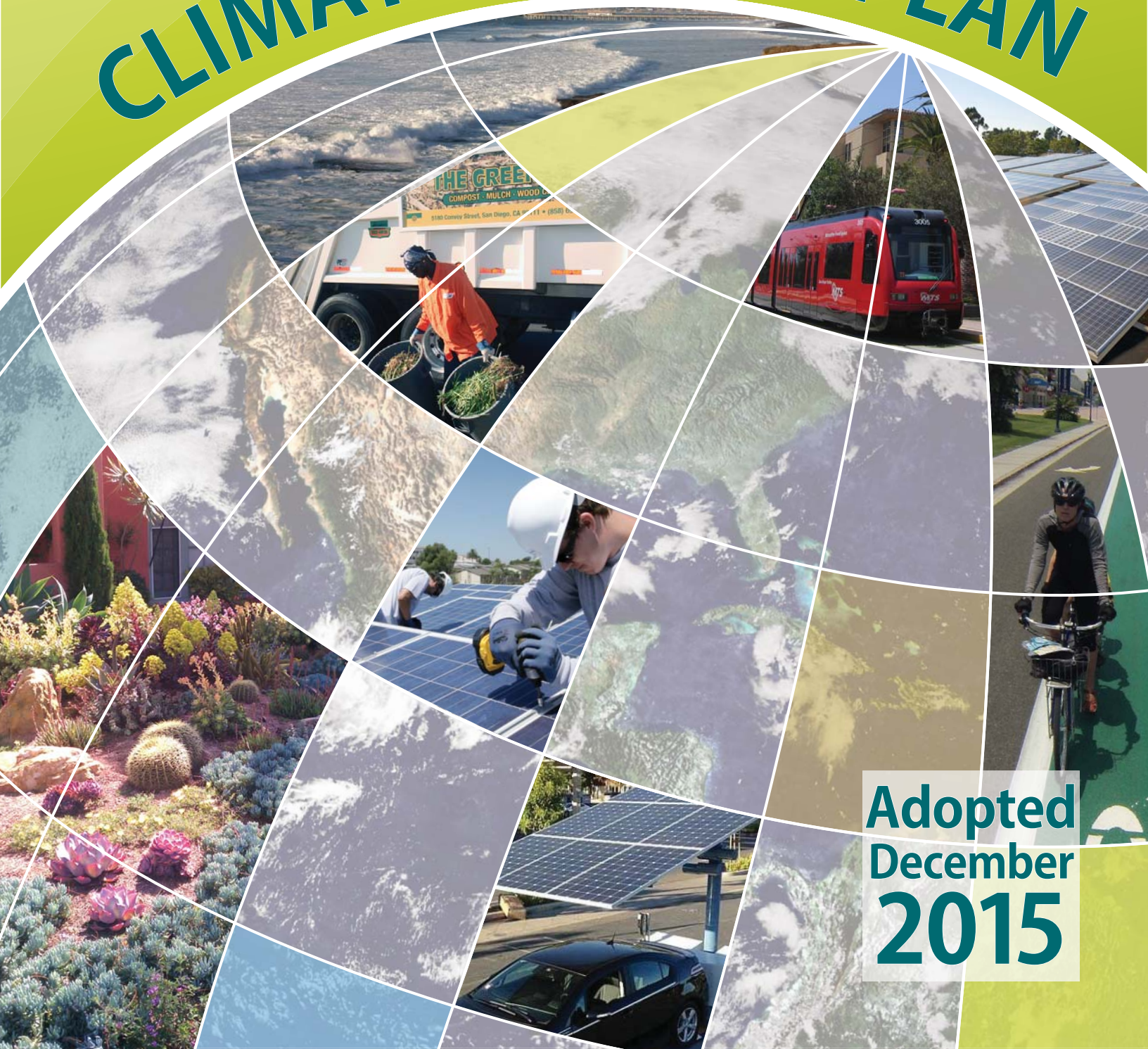
Mayor Kevin L. Faulconer

CITY OF SAN DIEGO

CLIMATE ACTION PLAN



Adopted
December
2015

CITY OF SAN DIEGO
CLIMATE ACTION PLAN

Prepared by:
The City of San Diego

In consultation with**:**

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Sustainability Consulting

EPIC
ENERGY POLICY INITIATIVES CENTER
UNIVERSITY OF SAN DIEGO SCHOOL OF LAW

KEVIN L. FAULCONER

MAYOR

Today, we are faced with an issue that affects us all. Our city's responsibility is to ensure a clean, sustainable San Diego for generations to come. Through this Climate Action Plan, San Diegans from different backgrounds are coming together to proactively address environmental concerns, strengthen our economy and improve our quality of life.

This Climate Action Plan sets forth common-sense strategies to achieve attainable greenhouse gas reduction targets. Apart from reducing greenhouse gases, this plan will:

- Create green jobs through incentive-based policies, such as the manufacturing and installation of solar panels;
- Improve public health by removing harmful pollutants from our air and improve water quality;
- Increase local control over our future by reducing dependence on imported water and energy;
- Help homebuyers educate themselves on the energy and water usage of a building before purchasing, without adding significant delay or cost to the home-buying process;
- Enhance quality of life by supporting active transportation, planting trees and reducing landfill waste; and
- Save taxpayers' money by decreasing municipal water, waste and energy usage in city-owned buildings.

San Diego is a leader in innovation and sustainability. By striking a sensible balance between protecting our environment and growing our economy, San Diego can support clean technology, renewable energy and economic growth.

We have an opportunity to improve the lives of every San Diegan in all of our neighborhoods. This plan reflects our duty to preserve our children's future and hand down a San Diego that is cleaner than it was when we received it. San Diego's next chapter starts here.

Sincerely,

Kevin L. Faulconer
Mayor, City of San Diego

ACKNOWLEDGEMENTS

Mayor Kevin Faulconer

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Ten Fifty B Street - Lobby

EXECUTIVE SUMMARY

Civita - Mission Valley

Former Governor Arnold Schwarzenegger's Executive Order S-3-05 established the 2050 statewide greenhouse gas (GHG) reduction target of 80 percent below 1990 levels. Governor Schwarzenegger also signed Assembly Bill 32 (AB 32) in 2006 which set a statewide reduction target of 1990 levels by 2020 and created a comprehensive, multi-year program to reduce GHG emissions in California. In 2015, Governor Jerry Brown issued Executive Order B-30-15 establishing an interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050.

Pursuant to AB 32, the California Air Resources Board (CARB) adopted the Climate Change Scoping Plan with a recommendation for local governments to adopt a goal for municipal operations and community-wide emission reduction by approximately 15 percent from current levels by 2020. In accordance with this recommendation, the City's Climate Action Plan (CAP) includes a municipal operations and community-wide GHG emissions baseline calculation from 2010 and sets a target to achieve a 15 percent reduction from the baseline by 2020.

In its 2014 update to the Climate Change Scoping Plan, CARB recommended local governments chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals, such as the GHG reduction target set in Executive Order S-3-05. To remain consistent in its GHG reduction calculation approach, the City calculated its 2050 GHG emission reductions at 80 percent below the 2010 baseline and set a 2035 target based upon the trajectory for meeting the City's 2050 reductions. Therefore, the 2035 target should be considered an "interim" target towards achieving the City's 2050 emission reductions target. As shown in Figure 2.2, if the measures in this CAP are implemented, the City would be on the trajectory for meeting its 2050 reduction trajectory target.

To address the state target set by Executive Order B-30-15, CARB is updating its Climate Change Scoping Plan to provide a framework for achieving the 2030 target. If CARB's updated Scoping Plan includes a recommendation for a percentage reduction for local governments, the City will amend its 2030 target accordingly. The City recognizes it may become necessary to modify the CAP to account for federal and state actions or improvements in technology and efficiency, and will do so through its annual monitoring reports. It is anticipated that an update of the CAP will occur by 2020.

CAP implementation will be dependent upon the future adoption of numerous implementation ordinances, policies, and programs. A cost/benefits analysis will be prepared as each implementation measure is presented to City Council for consideration. Attainment of the reduction targets will require significant City and regional actions, continued im-

San Diego is taking the lead in California to tackle climate change.

plementation of federal and state mandates, and dedicated San Diegans choosing to take individual actions to be a part of the solution.

These actions and associated co-benefits will contribute to the City's future prosperity and quality of life by:

- Furthering San Diego's leadership in clean technology industries, such as renewable energy, information technology, manufacturing, and waste management.
- Advancing the "City of Villages" concept of walkable and pedestrian-friendly neighborhoods with a mixture of uses that revitalize existing neighborhoods while retaining their individual character.
- Promoting active transportation and rapid transit systems to help preserve and improve accessibility for vulnerable groups, including: children, the elderly, people with disabilities, and the economically disadvantaged.
- Fostering programs to create well-paying jobs. Implementation of the CAP will lead to an increased demand for workers in high-growth "green" industries. This will lead to greater opportunities for new and existing workers to flourish in these innovative sectors.
- Building communities that are resilient to climate change through the identification of vulnerabilities and the corresponding implementation of adaptation measures. These measures are intended to protect public health and safety; secure and maintain water supplies and services; protect and maintain urban infrastructure and community services; protect environmental quality; maintain open space, parks, and recreation; support coastal management and protection; promote urban forest management and local food production; improve building and occupant readiness; and enhance community education, knowledge and collaboration.

The City has identified **FIVE BOLD STRATEGIES** to reduce GHG emissions to achieve the 2020 and 2035 targets:

1. ENERGY & WATER EFFICIENT BUILDINGS
2. CLEAN & RENEWABLE ENERGY
3. BICYCLING, WALKING, TRANSIT & LAND USE
4. ZERO WASTE (GAS & WASTE MANAGEMENT)
5. CLIMATE RESILIENCY

These viable strategies will leverage the City's existing efforts as well as provide clear direction for meeting the challenges of a changing climate.

The 2015 CAP demonstrates to San Diego businesses and residents that the City acknowledges the existing and potential impacts of a changing climate and is committed to keeping it in the forefront of decision-making. Successful implementation of the CAP will: 1) Prepare for anticipated climate change impacts in the coming decades, 2) Help the State of California achieve its reduction target by contributing the City's fair

share of GHG reductions, and 3) Have a positive impact on the regional economy.

The CAP contains five chapters: Background, Reducing Emissions, Implementation and Monitoring, Social Equity and Job Creation, and Adaptation. Appendices A through E provide additional detail on topics covered within the CAP. A brief summary of each chapter follows:

Chapter 1 - Background: Provides an introduction and purpose for the creation of the CAP. Specifically, the CAP serves as mitigation for the City's adopted General Plan as explained in Chapter 1. The General Plan calls for the City to reduce its carbon footprint through actions including adopting new or amended regulations, programs, and incentives. General Plan Policy CE-A.13 specifically identifies the need for an update of the City's 2005 Climate Protection Action Plan that identifies actions and programs to reduce the GHG emissions of the community-at-large, and City operations. Additionally, with future implementing actions, it is anticipated that the CAP will serve as a "Qualified GHG Reduction Plan" for purposes of tiering under CEQA.

Chapter 2 - Reducing Emissions: Delivers a baseline inventory for 2010; emission forecasts for 2020 and 2035; establishes reduction targets for 2020 and 2035; and identifies federal, state and local measures to reduce emissions that when totaled meet or exceed the 2020 and 2035 targets.

Chapter 3 -Implementation and Monitoring: Details the implementation action and phasing for individual goals. For each of the five strategies, the CAP identifies goals, actions, targets, supporting measures, parties responsible for implementation and estimated GHG reductions for 2020 and 2035. This chapter also illustrates the contents of the Annual Monitoring Report, including the results of the annual GHG inventory, social equity, and jobs monitoring.

The City anticipates that new technologies and innovative programs developed in the future can enhance, or even replace, the strategies and actions currently proposed. This consideration will allow the City to be flexible, yet diligent, in its effort to reduce emissions and prepare for a changing climate.

Chapter 4 - Social Equity and Job Creation: Describes how the impacts of climate change will disproportionately affect disadvantaged communities and how the City can proactively identify them prior to project implementation. This chapter also illustrates how climate plan policies can lead to the creation of well-paying jobs and actions the City of San Diego is taking to promote economic growth.

Chapter 5 - Adaptation: Identifies climate impacts for San Diego, illustrates current climate adaptation efforts throughout the state, and provides a guide to adaptation strategy development.


Encanto

Cortez Hill

CHAPTER 1

BACKGROUND

Balboa Park - Museum of Man

If there is a single word that describes the San Diego region, it is "paradise." And this paradise is our home.

– Our Greater San Diego Vision 2012

When people migrated to San Diego during the transition from the late 19th to the 20th century, they were drawn to a romantic vision of the City – a Spanish Colonial paradise. That vision so enchanted people, it became a reality.

Now, in the 21st century, San Diego is considered one of the finest cities in the world with a high quality of life. Its friendly people, dynamic economy, beautiful setting, and temperate climate have made it a world-class destination. Residents and visitors alike enjoy the magnificent beauty of the region; its wonderful, diverse communities; and strong entrepreneurial spirit.

While the San Diego of today is every bit as beautiful as that vision from the early 1900's, modern life can pose its challenges - yet San Diegans have always seized the opportunity to take them on with a passion. Many of the challenges San Diegans face are local in nature and therefore easier to comprehend and solve. Others, whether regional, national, or even international in nature, are less tangible and require more complex solutions. Dealing with climate change is one of these pressing issues. Often discussed in global terms, the impacts of the changing climate can sometimes seem insurmountable. For San Diego, these challenges present opportunities.

The potential impacts of a changing climate - higher seasonal temperatures, worsening air quality, diminished water supplies, disruption of agricultural cycles - have great consequences not only for the built and natural environment, but also for the community's health and economic vitality. However, since we directly and indirectly influence the emissions of greenhouse gases (GHGs), the major cause of climate change, we are uniquely positioned to respond.

The City will provide leadership with key strategies to reduce emissions, coupled with a focus on building sustainable economic opportunities for our residents and communities, and a commitment to improving the resilience of our communities and our City to potential future impacts of climate change.

The City of San Diego places great importance on proactive planning to reduce or eliminate the long-term risk to people and property within the community from a changing climate. The Climate Action Plan (CAP) helps implement the goals of San Diego's General Plan and provides a pathway toward a better future.

The City of San Diego General Plan (2008) is based on the City of Villages smart growth strategy which directs growth into compact, mixed-use, walkable centers linked by transit. This compact urban form reduces the need to travel and makes alternative modes of transportation easier to use. The CAP will support implementation of the General Plan through support for continued incremental changes to the urban land use form, providing greater transportation choices, and transforming how we produce and use energy. Further, the CAP will complement the General Plan policies to reduce greenhouse gas emissions with quantifiable data and benchmarks for success.

Today, San Diego has the opportunity to take action that will not only help to mitigate the impacts of climate change, but preserve and improve our quality of life. By reducing our energy and fuel consumption we save money, improve the air, and enjoy better public health. By planting trees we create shade on hot days and help to create beautiful, quality neighborhoods. Meeting this challenge at the local level can, and will, dramatically enhance our standard of life and continue to preserve the romantic vision that has charmed San Diegans for the past 150 years.

A Brief History of Climate Change Legislation

California's landmark global climate change legislation, the Global Warming Solutions Act of 2006 (AB 32), established the state's goal of substantially reducing its GHG emissions: to 1990 levels by 2020. Subsequent legislation, namely Senate Bill (SB) 97, adopted in 2007, addresses climate change by requiring lead agencies to analyze GHGs under CEQA. Additionally, the Sustainable Communities and Climate Protection Act of 2008 (SB 375) requires each Metropolitan Planning Organization to prepare a Sustainable Communities Strategy as part of its Regional Transportation Plan that includes land use, transportation, and housing policies to reduce regional GHG emissions.

Based on the 2011 California Air Resources Board's (ARB) Scoping Plan, the City of San Diego's CAP is a proactive step toward addressing the City's GHG emissions. The CAP includes a quantitative inventory of GHG emissions (baseline), a projection of emissions for 2020 and 2035 (business-as-usual scenarios), and City-specific targets to reduce GHGs by 2020 and 2035, helping to achieve statewide 2020 and 2030 targets, and putting the City on the trajectory of meeting its share of the 2050 statewide target.


Drought Tolerant Landscaping

Addressing Climate Adaptation

Some degree of climate change will occur regardless of the City's effort to reduce and mitigate GHG emissions. As a result, the City will need to adapt to these changes within the context of the community's environmental and socioeconomic system. The City of San Diego will develop a stand-alone climate adaptation plan that will integrate, and build upon, the strategies and measures in the CAP.

The CAP will provide a road map for the City to collaborate with communities in assessing vulnerability to future climate change, developing overarching adaptation strategies and implementing measures to enhance resilience. The Climate Adaptation section of this report describes the initial stages of this assessment. However, the work to date provides only an outline of the potential vulnerabilities that the City and its communities may face, and a cataloging of potential response measures.

The City will separately assess fully the specific vulnerabilities that we face, and work with the communities to develop strategies and measures to address these vulnerabilities. The City will conduct this assessment in a manner that is both cost-effective and aligned with the broader tenets of the CAP to reduce our contributions to climate change and create economic opportunities in the process. More information regarding climate adaptation can be found in **Chapter 5 - Adaptation**.

Avenida Del Rio between Fashion Valley Mall and Camino De La Reina in Mission Valley flooded after a heavy rain, 2009

What are the benefits of a Climate Action Plan for San Diego?

Improving Public Health and Air Quality

The US Environmental Protection Agency (EPA) found that GHGs constitute a threat to public health and welfare and that the emissions from motor vehicles cause and contribute to the climate change problem (EPA 2013). The prevalence of asthma is strong indicator of the severity of unhealthy conditions in San Diego communities. According to the American Lung Association State of the Air 2013 Report, the greater San Diego area ranks eleventh nationally among metro areas in ozone pollution and 23rd in short-term particulates (American Lung Association, 2013). Therefore, minimizing GHG emissions from transportation will help improve air quality for these specific populations by reducing other harmful air pollutants, such as carbon monoxide, sulfur dioxide, and particulate matter.

Providing Energy Independence

Smarter building design and construction practices, including passive solar heating and cooling, building orientation, and installing renewable energy systems, will reduce the demand for imported energy. Additionally, generating clean energy locally for our community will help keep dollars here in San Diego.

Spurring Economic Development

Reinvestment in local buildings and infrastructure will provide new opportunities for skilled trades and a variety of professional services as well as increasing San Diego's global competitiveness in the world economy. The methods and tools include public/private partnerships and hands-on training, providing an opportunity for labor and businesses to work together to build a green economy.

Co-benefits of Addressing Climate Change

San Diego, as a community, will benefit from the efforts provided in this CAP. While the actions included in the CAP are generally oriented towards reducing GHG emissions, many of them also have "co-benefits" - the ancillary or additional benefits of the policy - including cost savings, job creation, improved public health and economic opportunities.

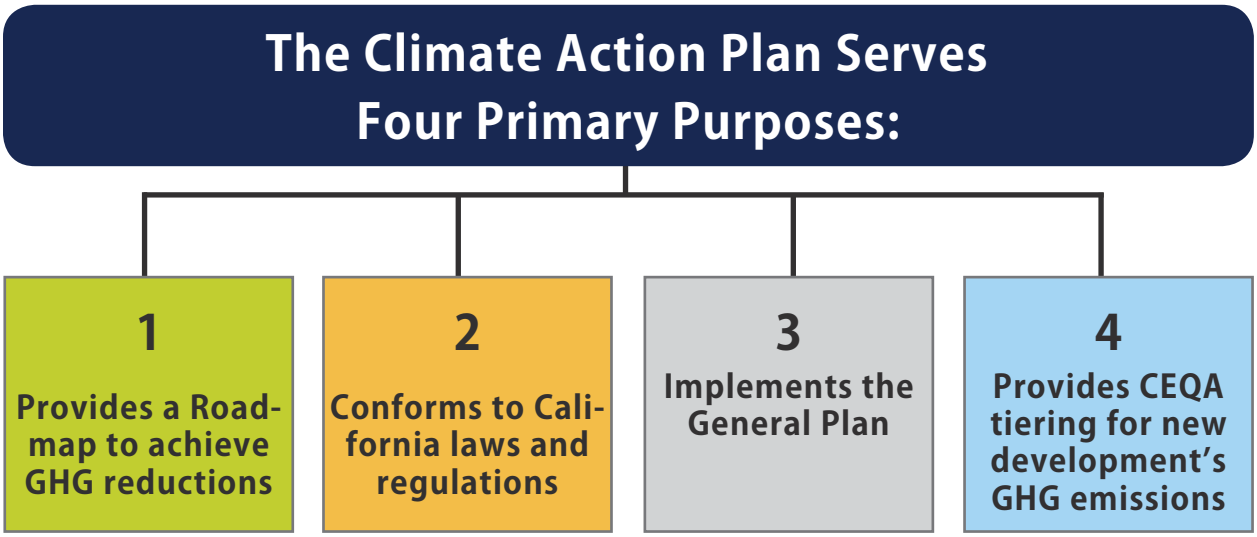
Chollas Creek Trail

For example, strategies in the CAP are intended to increase the energy and water efficiency of buildings and expand alternative transportation choices. In turn, the energy savings increase the capacity for local residents and businesses to purchase other goods and services. If spent locally, this can boost our local and regional economy and help to create jobs.

With an expanded active transportation infrastructure, San Diego citizens and visiting tourists will have options other than driving cars. This transition to walking, bicycling, and public transit will not only reduce GHG emissions, but improve the air quality as a result of fewer vehicle miles traveled and improved traffic congestion.

Sustainability Program Manager

As a companion item to the CAP, the Mayor and City Council established the position of Sustainability Program Manager, as part of the FY15 Budget, to oversee implementation of the CAP and the development of the climate adaptation plan. It is anticipated that the Program Manager will work closely with staff from various City Departments and representatives from the community ranging from businesses and industry associations to environmental groups, and will be asked to provide annual reports to the City Council and oversee future CAP updates.



Connecting the General Plan with the Climate Action Plan

The City's first Climate Protection Action Plan (CPAP) was approved in 2005 and focused on the City's mission to reduce emissions from municipal operations. The CPAP was central to fostering heightened awareness and developing "climate change literacy" within the City and the community.

Similarly, the General Plan (GP), adopted in 2008, is the framework for the City's commitment to long-term conservation, sustainable growth, and resource management. It addresses GHG emission reductions through its City of Villages growth strategy and a wide range of inter-disciplinary policies.

The City's General Plan Program Environmental Impact Report (PEIR) Mitigation Monitoring and Reporting Program (MMRP) specifically discusses the mitigation of climate change on pages 49-50.

General plan policies related to climate change are integrated throughout the document, and summarized in Conservation Element Table CE-1.

Key policies related to the CAP are:

- Policy CE-A.2 to "reduce the City's carbon footprint" and to "develop and adopt new or amended regulations, programs and incentives as appropriate to implement the goals and policies set forth" related to climate change.

- Policy CE-A.13 to "regularly monitor, update, and implement the City's Climate Protection Action Plan, to ensure, at a minimum, compliance with all applicable federal, state, and local laws."

The CAP identifies measures to reduce the City's carbon footprint per Policy CE-A.2 and updates the City's Climate Protection Action Plan per Policy CE-A.13. As such, the CAP mitigates the cumulatively significant global warming impacts of the General Plan and provides a framework for mitigation of future projects.

The California Environmental Quality Act (CEQA): Tiering from the 2015 Climate Action Plan

With future implementing actions, it is anticipated that the CAP will serve as a Qualified GHG Reduction Plan for purposes of tiering under CEQA. With those future implementation actions, it is anticipated that the CAP meet the requirements set forth in CEQA Guidelines section 15183.5, whereby a lead agency (e.g. the City of San Diego) may analyze and mitigate the significant effects of GHG emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce GHG emissions. CEQA Guidelines section 15183.5(b) states that a plan for the reduction of greenhouse gas emissions should:

1. Quantify greenhouse gas 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 greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
3. Identify and analyze the greenhouse gas 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.

Construction at Balboa Park

Barrio Logan

Following adoption of the CAP and other necessary implementing actions, the City of San Diego will prepare and present to City Council for adoption a refined CEQA streamlining proposal to allow project-specific environmental documents, if eligible, to tier from and/or incorporate by reference the CAP's programmatic review of GHG impacts in their cumulative impacts analysis. The proposal will provide a streamlined review process for the GHG emissions analysis of proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to CEQA.

Juniper-Front Community Garden

CHAPTER 2

REDUCING EMISSIONS

Green bike lane along Harbor Blvd.

A GHG inventory is a collection of information about energy and emissions related activities within a specific scope or boundary. The GHG emissions inventory evaluated activities within the City of San Diego for major economic sectors, including residential buildings, nonresidential, transportation, water, solid waste, and municipal operations. The GHG emissions quantified in each of these sectors are associated with a variety of sources, including direct combustion of fossil fuels, purchased electricity, transportation (gasoline), solid waste, potable water, and materials. These sources are described in greater detail in **Appendix A.**

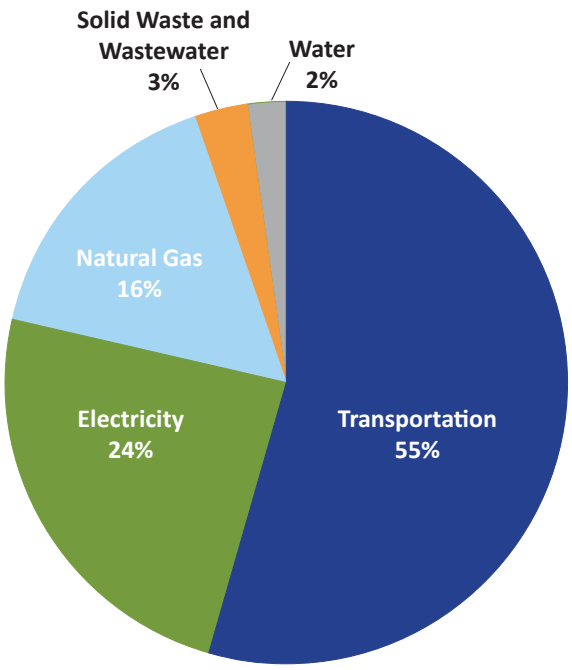
2010 Baseline Emissions

The 2010 baseline for the CAP is 12,984,993 Metric Tons of CO_2e. The GHG emissions inventory may be thought of as a point-in-time estimate of emissions. It provides a benchmark from which future emissions will be compared. The CAP uses a 2010 baseline pursuant to a recommendation from the California Air Resources Board that local governments set a 2020 reduction target of 15 percent below current emissions. Data and information from 2010 was used to calculate a reliable baseline of emissions for the City to use to set its reduction targets. The methods used to estimate GHG emissions for 2010 are consistent with the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions.

The breakdown of GHG emissions in San Diego is very similar to that of other Southern California cities. Due to the high frequency of single-occupancy vehicles trips, the transportation sector contributes the largest output of GHG emissions. This is followed by the energy sector (electricity and natural gas) and then by waste emissions (calculated as a combination of GHG emissions from the landfill and the wastewater system).

Figure 2.1 illustrates the community-wide emissions. Although not called out separately in the figure, municipal emissions contribute approximately one percent of the City of San Diego's community-wide GHG emissions. While this number may seem relatively insignificant, the GHG reduction potential represents an opportunity for the City to take a leadership role by reducing its own impacts. City operations include potable and recycled water treatment and distribution, wastewater treatment, solid waste and recycling collection, landfill management, street maintenance, and data management.

Figure 2.1: 2010 Community-wide Emissions Inventory



Business-as-usual Projections and Reduction Targets for 2020 through 2035

California has committed to reducing GHG emissions while accommodating a growing population and encouraging economic growth. The state's road map for achieving reductions - the Air Resources Board Scoping Plan - charts future emissions by comparing various policy options to a "business-as-usual" (BAU) scenario. The BAU scenario represents future GHG emissions without further regulatory or policy intervention to reduce emissions.

Figure 2.2 illustrates the 2010 baseline, the projected BAU emission levels, and City's reduction calculations for 2020 (24% below baseline), 2030 (41% below baseline) and 2035 (51% below baseline). The figure is displayed in metric tons of carbon dioxide equivalents (MT CO_2e).

Figure 2.2: City Projected GHG Emission Levels and Reduction Targets.

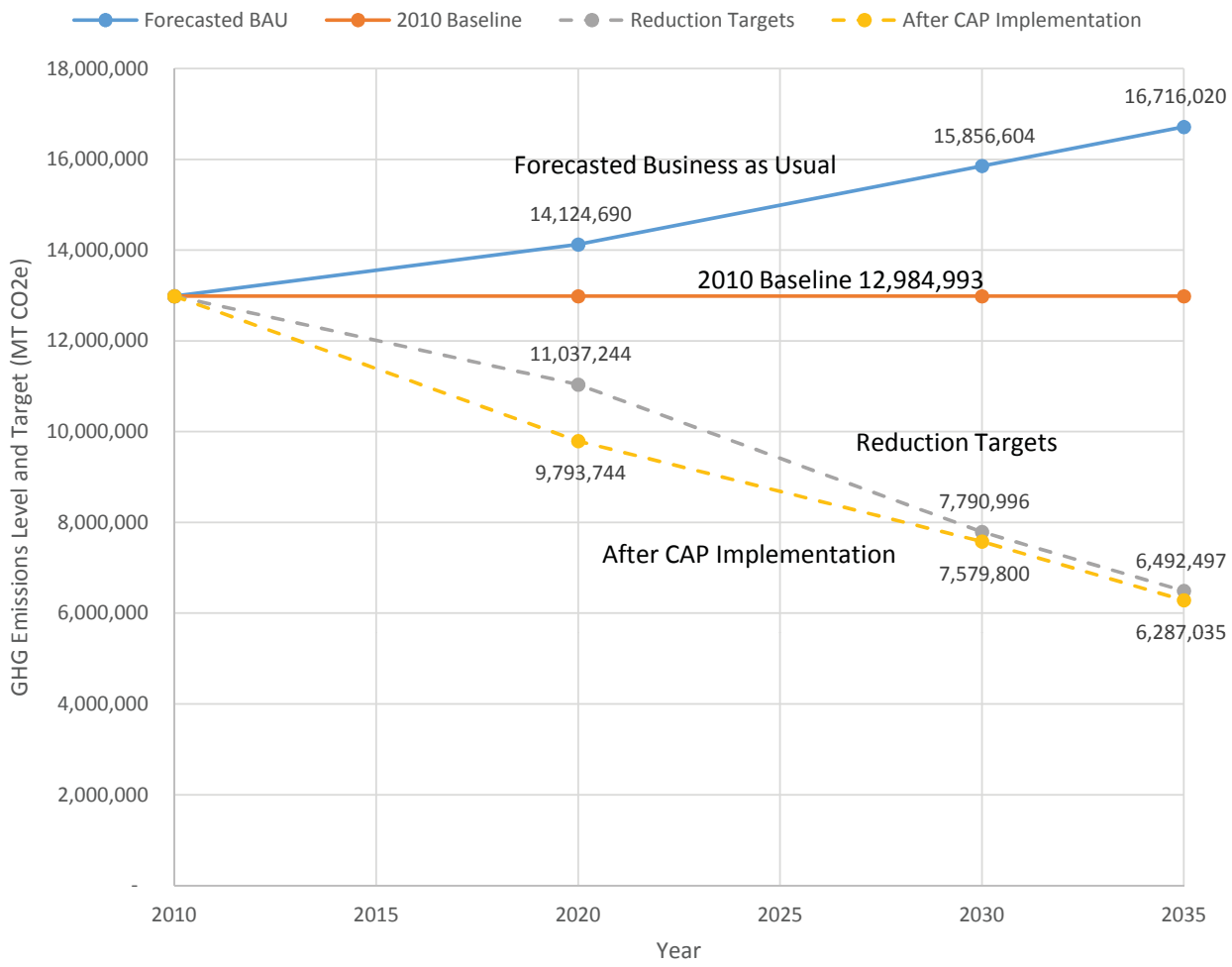


Table 2.1: GHG Emissions Reduction Values (MT CO_2e)

	2020	2030	2035
2010 Baseline	12,984,993	12,984,993	12,984,993
Total Projected Emissions (Business As Usual)	14,124,690	15,856,604	16,716,020
City Target Emission Levels	11,037,244	7,790,996	6,492,497
Total Reductions From CAP	4,330,946	8,276,04	10,428,926
Total Resulting CO_2e Emission Levels	9,793,744	7,579,800	6,287,035

The CAP also includes a BAU projection of emissions through 2035 for the City. The BAU projection starts with the baseline year, a regulatory snapshot of the world at that time, and projects emissions into the future based on expected changes to population and economic activity. It assumes that all other variables, such as policies to reduce emission, remain constant through 2035. For example, in 2010 about 12 percent of electricity supplied to the City was from renewable sources. Even though the law requires suppliers to reach a renewable level of 33 percent by 2020, the BAU projection assumes only 12 percent renewable through 2035. **Appendix A** provides a detailed summary of the assumptions used to develop the BAU projection.

As illustrated in **Table 2.1**, the CAP consists of a 2010 inventory of GHG emissions; a BAU projection for emissions at 2020, 2030, and 2035; a calculation of the City's targets based on a reduction from the 2010 baseline; and emission reductions with implementation of the CAP.

Accounting for future population and economic growth, the City projects GHG emissions of **14,124,690** MT of CO_2e in 2020 and **16,716,020** MT of CO_2e in 2035. As described on page 3, the CAP, in compliance with the California Air Resources Board (CARB) recommendation, sets a target to achieve a 15 percent reduction from the 2010 baseline by 2020. The CAP also includes reduction targets to reduce emissions below the 2010 baseline by 40 percent by 2030, and 50 percent by 2035. Therefore, the City must implement strategies that reduce emissions to **11,037,244** MT of CO_2e in 2020, **7,790,996** MT of CO_2e in 2030, and **6,492,497** MT of CO_2e in 2035.

By meeting the 2020 and 2035 targets, the City will maintain its trajectory to meet its proportional share of the 2050 state target. Future actions anticipated by the state and possible federal initiatives would reduce the need for local measures and help ensure broader participation in emission reduction efforts. If CARB adopts a recommendation for a percentage reduction for local governments for future years, the City will amend its targets accordingly.

Figure 2.3: GHG Reductions by Sector and Target Year

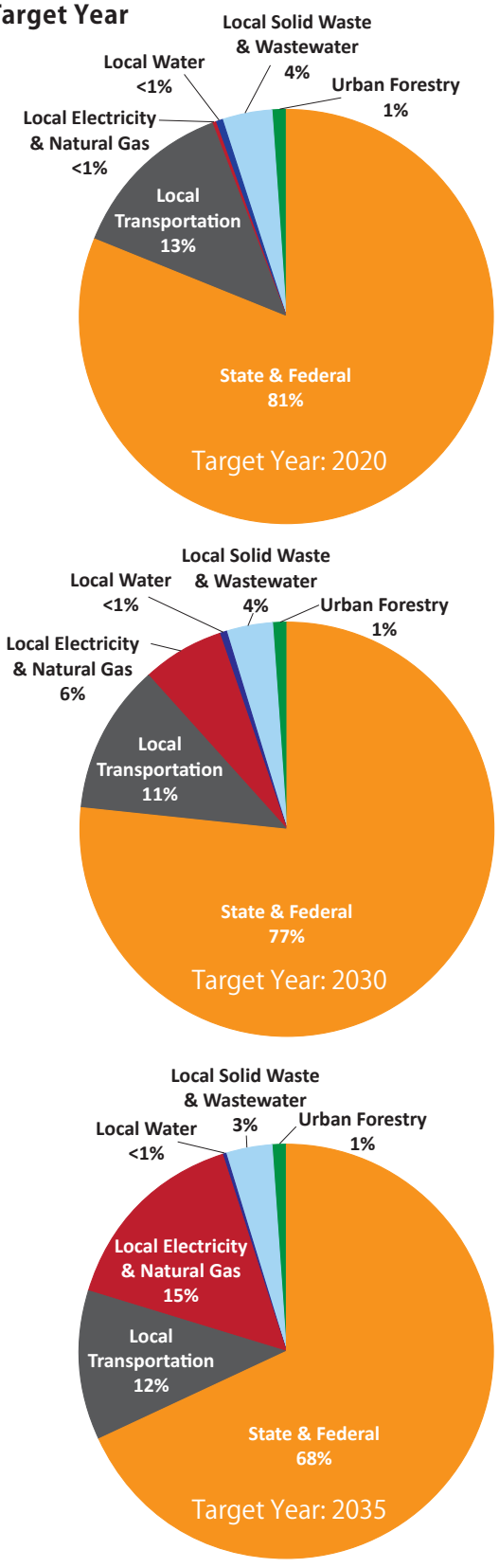


Figure 2.3 breaks down the various GHG emission reductions by sector for 2020, 2030, and 2035.

The regional, local, city actions included in the CAP were identified as part of an iterative process with the Environmental and Economic Sustainability Task Force (EESTF), City staff, and stakeholders. The final list of recommendations includes actions with the greatest reduction potential as well as actions where the City has the greatest opportunity and authority for implementation.

The CAP also includes mandatory GHG reduction actions that have been adopted by federal and state agencies. The City performed its analysis assuming implementation of these adopted actions. When state and federal mandates are fully implemented by 2020, these actions will provide approximately 81 percent of the 2020 GHG reductions and 68 percent of the 2035 GHG reductions. For further information on the methodology of how the GHG reduction strategies were generated, refer to **Appendix A**.

The City's ability to grow its population and economy while meeting the GHG reduction targets will require a broad-based participation that no single emissions category, organization, or institution can achieve on its own. This is a challenge that must be shared by the entire community. Everyone who lives, works, shops, or plays in the City contributes to the community's GHG emissions, and everyone will need to be part of the solution.

Local Strategies

Strategy 1: Energy & Water Efficient Buildings

Both non-residential and residential buildings offer opportunities for emissions reductions in new development as well as existing structures. Generally, building strategies focus on site-specific design and innovation, and technological improvements that increase energy efficiency and provide renewable energy generation. Because both non-residential and residential property owners, as well as their respective tenants, have different needs and demands, reduction strategies will consist of a mixture of regulatory mandates and incentives to improve building performance.

The City has identified FIVE BOLD STRATEGIES to reduce GHG emissions to achieve the 2020 and 2035 targets:

1. **ENERGY & WATER EFFICIENT BUILDINGS**
2. **CLEAN & RENEWABLE ENERGY**
3. **BICYCLING, WALKING, TRANSIT & LAND USE**
4. **ZERO WASTE**
5. **CLIMATE RESILIENCY**

Strategy 2: Clean & Renewable Energy

Clean, renewable energy is essential to achieving the GHG reduction targets. A combination of on-site generation and large-scale renewables will assist the City in meeting its GHG reduction targets in the most efficient way. The City aims to facilitate installation of renewable energy locally, and suport local job creation as part of this strategy.

Strategy 3: Bicycling, Walking, Transit & Land Use

Transportation strategies cover a broad range of activities that aim to reduce vehicle miles travelled (VMTs), improve mobility, and enhance vehicle fuel efficiency. Specific implementation measures involve changing land uses, adopting a new perspective on community design, promoting alternative modes of travel, revising parking standards, and managing parking.

Strategy 4: Zero Waste (Gas & Waste Management)

There are several different options for managing waste including source reduction, increased recycling, and gas capture.

Scripps Recreational Center

The Growing Presence of Renewable Energy in San Diego

- The City's Miramar Landfill and the Metro Biosolids Center have contracts with companies that collect the methane gas to serve their private cogeneration facilities at the Metro Biosolids Center and North City Water Reclamation Plant and the City generator at North City Water Reclamation Plant, and produce nearly 15 MW of energy. These renewable energy facilities service the North City Water Reclamation Plant, the Metro Biosolids Center, the Miramar Landfill, and the Marine Corps Air Station Miramar. The excess energy is fed back to the SDG&E.

- The City has a contract with a company that implemented the Beneficial Utilization Digester Gas (BUDG) project which process the excess gas produced at the Point Loma Wastewater Treatment Plant to produce green gas and inject it into the SDG&E natural gas pipeline, which is being used by the 4.5 MW of ultra clean fuel cells owned by a private contractor.

- The City is partnering with the San Diego County Water Authority to conduct an in-depth study of the feasibility of a multi-year renewable energy project at the San Vicente Reservoir. The study will also evaluate the potential contribution of a large-scale pumped storage project toward meeting the City's renewable energy needs.

- The City also has photovoltaics (solar) systems installed at various facilities, including water treatment plants that produce approximately 2.2 MWs of renewable energy.

San Diego EcoDistricts - North Park and Pacific Beach

Working with two key community partners- San Diego Gas and Electric and the San Diego Green Building Council- and inspired by the EcoDistricts model, the North Park EcoDistrict was launched in early 2013. The North Park EcoDistrict goal is to evolve as a neighborhood that collectively uses resources mindfully, embodies a thriving green economy, sustains it's historic nature, provides for the well-being of community members, nurtures the local environment, promotes equity in many fashions and inspires community members and other neighborhoods.

In the Pacific Beach community, a group of architects, the Pacific Beach Planning Group, and community members, in cooperation with The American Institute of Architecture (AIA), have held extensive workshops to develop a vision for a community-wide EcoDistrict. Some of the first steps identified by the AIA Sustainable Design Assessment Team include engaging the community to work collaboratively to improve the environment of Pacific Beach and to improve the conditions for bicycling and walking.

Methane gas is a by-product from the decomposition of organic material, and it is a GHG that has 20 times the warming impact as carbon dioxide. For this reason, landfills and wastewater treatment plants were among the first facilities required to report emissions under AB 32.

As reduction of waste entering the landfill greatly reduces GHG emissions, the goal for the City is to achieve a 75 percent waste diversion rate by 2020. The City also has a goal to strive for Zero Waste disposal by 2040.

Strategy 5: Climate Resiliency

Climate Resiliency can be defined as the capacity of a system to absorb disturbance and reorganize while undergoing change and still retain essentially the same function, structure and feedbacks, and therefore identity. The intent is to develop programs, policies, and processes that are not rigid or static, but rather flexible allowing change to accommodate unexpected events and shocks and continue to function effectively. This document illustrates the path forward by providing next steps and recommendations for areas of further analysis.

Plug-in Fed Ex Delivery Truck

Federal and State Strategies

State and Federal regulations will continually evolve over the life of the CAP. The CAP provides flexibility for the City to make amendments to account for these new requirements and adjust the CAP to meet its goals.

Federal Corporate Average Fuel Economy

The US EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) joint rule established a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that has already reduced GHG emissions and improved fuel economy.

Car-charging at Balboa Park

The standards for tailpipe GHG emissions and fuel economy were tightened in 2012 for 2017-2025 models, which will lead to even greater reductions by 2025 (National Highway Traffic Safety Administration, 2012).

California Renewables Portfolio Standard

Established in 2002 under SB 1078, accelerated in 2006 under SB 107 and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 (California Public Utilities Commission, 2014).

California Public Utilities Commission Long-Term Energy Efficiency Strategic Plan

On Sept. 18, 2008, the CPUC adopted California's first Long Term Energy Efficiency Strategic Plan, presenting a single road map to achieve maximum energy savings across all major groups and sectors in California. This comprehensive plan, running through 2020, is the state's first integrated framework of goals and strategies for saving energy, covering government, utility, and private sector actions, and holds energy efficiency as the highest priority resource in meeting California's energy needs (California Public Utilities Commission, 2013).

California Low Carbon Fuel Standards

Executive Order S-1-07, the Low Carbon Fuel Standards (LCFS) calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020 (California Air Resources Board, 2014).

California Air Resources Board Heavy Duty Vehicle Regulations

Adopted in December 2008, this regulation requires improvements in heavy-duty vehicles. The regulation is expected to reduce GHG emissions by approximately 1 million metric tons of CO_2e by 2020, statewide. By the end of 2020 it is estimated that truckers and trucking companies will save about $8.6 billion because diesel fuel consumption will be reduced by as much as 750 million gallons for travel in California and 5 billion gallons for travel across the nation (California Air Resources Board, 2014).

Comprehensive Energy Efficiency Program for Existing Buildings

Assembly Bill 758 (Skinner, Chapter 470, Statutes 2009) requires the Energy Commission to develop a comprehensive program to achieve greater energy efficiency in the state's existing buildings. The Energy Commission has created the Comprehensive Energy Efficiency Program for Existing Buildings Scoping Report, which outlined market needs and identified barriers to implementation. The Energy Commission will also adopt the AB 758 Action Plan, a roadmap of strategies encompassing all energy efficiency approaches. The program will also focus on implementing the roadmap to scale to achieve energy efficiency goals, partnerships, and market development and develop and institute a plan to move energy efficiency practices into the mainstream.

CHAPTER 3

IMPLEMENTATION AND MONITORING

Hillcrest Neighborhood

Implementation and monitoring will ensure a successful Climate Action Plan.

The CAP identifies a comprehensive set of goals, actions, and targets that the City can use to reduce GHG emissions. These actions include a combination of ordinances, City Council policies, resolutions, programs, and incentives, as well as outreach and education activities. Before items are presented to the City Council, a cost benefit analysis will be performed, including a cost-per-GHG reduction analysis. As implementation occurs, each action will be assessed and monitored. The City of San Diego recognizes the need for proper staffing, financing, and resource allocation to ensure the success of each mechanism included in the CAP.

The City also recognizes that given the long planning horizon of the CAP, it may become necessary to modify the specific actions as circumstances change over time. For example, some of the actions are at the early stages of development and will require feasibility studies, coordination with other agencies, or funding sources to be secured before they can be implemented. Additionally, improvements in energy technology and efficiency, transportation technology and fuels, building standards, consumer behavior, and future federal and state regulations may warrant revisiting the actions over time. While the City is committed to meeting the 2020 and 2035 GHG reduction targets, the City recognizes that there are multiple ways to achieve that goal and that flexibility in implementation is necessary to allow the City to evolve its strategies to achieve the most effective path to the desired result. The City may amend the CAP when circumstances require the CAP actions to provide additional flexibility or clarity. These circumstances include, but are not limited to, new available data and resources, state and federal legislation or regulations, new technology, new regional plans, and new standards in GHG emission reduction calculations. Specifically, for identified local ordinance, policy or program actions to achieve 2020 and 2035 GHG reduction targets, the City may substitute equivalent GHG reductions through other local ordinance, policy or program actions.

Little Italy Neighborhood

Table 3.1: Local, Regional, State and Federal Actions	2020 MT CO_2e Reduction	2030 MT CO_2e Reduction	2035 MT CO_2e Reduction
Strategy 1: Water & Energy Efficient Buildings			
1.1 Residential Energy Conservation and Disclosure Ordinance	3,218	6,078	5,605
1.2 City's Municipal Energy Strategy and Implementation Plan	11,580	12,321	9,011
1.3 New Water Rate and Billing Structure	12,210	14,948	12,277
1.4 Water Conservation and Disclosure Ordinance	12,589	19,898	21,470
1.5 Outdoor Landscaping Ordinance	2,090	1,888	653
Strategy 2: Clean & Renewable Energy			
2.1 Community Choice Aggregation Program or Another Program	-	531,254	1,592,878
2.2 Municipal Zero Emissions Vehicles	12,144	18,621	21,859
2.3 Convert Municipal Waste Collection Trucks to Low Emission Fuel	2,018	8,501	10,144
Strategy 3: Bicycling, Walking, Transit & Land Use			
3.1 Mass Transit	119,234	138,016	213,573
3.2 Commuter Walking	1,092	1,338	1,488
3.3 Commuter Biking	19,077	40,177	50,574
3.4 Retiming Traffic Signals	11,024	9,032	8,508
3.5 Install Roundabouts	2,110	2,506	2,172
3.6 Promote Effective Land Use to Reduce Vehicle Miles Traveled	-	73,051	109,576
Strategy 4: Zero Waste (Gas & Waste Management)			
4.1 Divert Solid Waste and Capture Landfill Emissions	154,467	283,309	344,213
4.2 Capture Methane from Wastewater Treatment	16,424	18,000	18,735
Strategy 5: Climate Resiliency			
5.1 Urban Tree Planting Program	43,839	82,806	102,290
Supporting Regional Action*			
SANDAG - SB 375	397,580	661,061	792,801
Supporting State and Federal Actions*			
CA Renewable Portfolio Standard (RPS)	887,084	840,086	398,219
CA RPS - Community Choice Aggregation or Another Program	-	960,098	1,592,878
CA Solar Programs	154,975	426,262	572,333
CA Vehicle Efficiency Standards - Pavley 1/CAFE	1,407,061	2,373,735	2,498,388
CA Low Carbon Fuel Standard	628,425	571,210	569,268
CA Electric Vehicle Policies and Programs	196,542	758,803	1,185,078
CA Energy Efficiency Policies and Programs	202,142	387,265	257,192
CA CARB Tire Pressure Program	25,920	27,840	28,800
CA CARB Heavy Duty Vehicle Aerodynamics	8,100	8,700	9,000
GHG Reductions Summary			
Total Reduction from State and Federal Actions	3,510,249	6,353,998	7,111,156
Total Reductions from Regional Actions	397,580	661,061	792,801
Total Reductions from Local Actions	423,116	1,261,745	2,525,027
Total GHG Reductions with Implementation of the Climate Action Plan	4,330,945	8,276,803	10,428,984
Target Summary			
2010 Baseline	12,984,993	12,984,993	12,984,993
Total Projected Emissions (Business-as-Usual)	14,124,690	15,856,604	16,716,020
City Target Emissions Levels	11,037,244	7,790,996	6,492,497
Resulting GHG Emissions with Implementation of the Climate Action Plan	9,793,744	7,579,800	6,287,035

* Regional, State and Federal Actions are not expanded upon further in the Implementation Tables as the City of San Diego does not need to enact local policies to support them.

Phasing

To optimize resource efficiency and overall effectiveness of implementing the actions, the CAP is divided into **three general phases:**

Phase 1: Early Actions

January 1, 2016- December 31, 2017

This phase includes short-term actions that are high-priority and return large emission reductions. In addition, short-term actions will include laying the foundation for longer-term actions. Diligent work in Phase 1 should decrease risks and increase chances for success of actions implemented in the later phases. Annual monitoring of implemented actions will inform the City, and public, of the CAP's GHG emissions reduction progress.

The early actions are necessary for the City to plan for, and reach, its 2020 and 2035 GHG Emissions Reduction Targets.

Phase 2: Mid-Term Actions

January 1, 2018- December 31, 2020

This phase includes mid-term actions specifically focused on helping the City to reach its 2020 GHG Emissions Reduction Target.

Phase 3: Longer-Term Actions

2021-2035

Long-term actions will take more time to implement but are essential for meeting the City of San Diego's 2035 GHG emissions reduction goals. While City government action is the primary focus of the CAP, many others in the community (as well as outside of it) will need to take action to achieve our bold vision.

Legend to Implementation Tables

Strategy = Corresponds to the FIVE Bold Strategies.

Lead Departments = Responsible City parties for ensuring implementation.

General Plan Policies = Referenced 2008 General Plan policy.

Goal = Effort to achieve a result.

Action = Regulatory and/or policy mechanisms to implement the GHG reduction target.

Target = Percentage of GHG emissions to be reduced by a defined time frame.

GHG Reductions = GHG reduction potential of each action in carbon dioxide equivalents based on substantial evidence provided in Appendix B.

Supporting Measures = Supporting Measures that assist in the implementation of the Actions. These Supporting Measures are not included in the quantified GHG reductions.

Table 3.1 (opposite page) outlines the Five Bold Strategies and the City's Local Actions' GHG emissions reduction values. The Local Actions are expanded upon on the following pages. For more detailed information on GHG Reductions, please refer to **Appendix A**.

STRATEGY 1: ENERGY & WATER EFFICIENT BUILDINGS

LEAD DEPARTMENTS: Environmental Services, Planning, Public Utilities and Development Services Departments

GENERAL PLAN POLICIES: CE-I.7, CE-I.5b, CE-I.13, CE-A.11e, CE-A.11h, CE-A.11i, CE-D.1h, CE-D.1i, CE-D.1j, CE-D.1k, CE-D.1l, CE-D.1m, CE-I.4

GOAL:

Reduce residential building energy consumption.

ACTION 1.1: **PHASE 1**

Present to City Council for consideration a residential Energy Conservation and Disclosure Ordinance.

TARGET:

Reduce energy use by 15% per unit in 20% of residential housing units by 2020 and 50% of units by 2035.

GHG REDUCTIONS:

2020	2035
3,218 MT/CO_2e	5,605 MT/CO_2e

GOAL:

Reduce municipal energy consumption.

ACTION 1.2: **PHASE 1**

Present to City Council for consideration a Municipal Energy Strategy and Implementation Plan.

TARGET:

Reduce energy consumption at municipal facilities by 15% by 2020 and an additional 25% by 2035.

GHG REDUCTIONS:

2020	2035
11,580 MT/CO_2e	9,011 MT/CO_2e

STRATEGY 1: ENERGY & WATER EFFICIENT BUILDINGS

GOAL:

Reduce daily per capita water consumption.

ACTION 1.3: **PHASE 2**

Support water rate structures that provide pricing signals that encourage water conservation and reuse, including greywater use, within the limits established by Propositions 218 and 26.

TARGET:

Reduce daily per capita water consumption by 4 gallons by 2020 and 9 gallons by 2035.

GHG REDUCTIONS:

2020	2035
12,210 MT/CO_2e	12,277 MT/CO_2e

ACTION 1.4: **PHASE 1**

Present to City Council for consideration a Water Conservation and Disclosure Ordinance.

TARGET:

Reduce daily per capita water consumption by 4 gallons by 2020 and 9 gallons by 2035.

GHG REDUCTIONS:

2020	2035
12,589 MT/CO_2e	21,470 MT/CO_2e

STRATEGY 1: ENERGY & WATER EFFICIENT BUILDINGS

ACTION 1.5: **PHASE 1**

Implement an Outdoor Landscaping Ordinance that requires use of weather-based irrigation controllers.

TARGET:

Reduce daily per capita water consumption by an additional 3 gallons by 2020 and an additional 5 gallons by 2035.

GHG REDUCTIONS*:

2020	2035
2,090 MT/CO_2e	653 MT/CO_2e*

SUPPORTING MEASURES FOR ENERGY & WATER EFFICIENT BUILDINGS:

- Expand the Property-Assessed Clean Energy (PACE) financing programs to further support residential and non-residential energy and water efficiency actions.
- Expand incentive programs that further promote energy and water efficiency in residential and non-residential buildings.
- Implementation of amendments to the City's Building Code that require installation of cool roof materials consistent with the supplementary measures contained in the CalGreen Code for new construction, significant repairs to existing roofs, and re-roofing.
- Implement a Smart Energy Management & Monitoring System (SEMMS) for municipal facilities to monitor and track energy consumption. Based upon results, staff will identify opportunities for greater efficiency and demand response.
- Develop a Zero Net Energy Policy for new municipal-owned buildings.
- Pursue LEED for Existing Buildings: Operation and Maintenance Certification for municipal facilities.
- Record the annual volume percentage of recycled water used and planned to be introduced through 2035. The report will include plans for increasing future annual volumes of recycled water/potable reuse as well as report the number of grey water permits filed for systems discharging more than 250 gallons per day.
- Pursue additional financial resources and incentives for implementing energy and water efficiency measures identified by the conservation and ordinances, and to promote the expansion of greywater systems.

STRATEGY 2: CLEAN & RENEWABLE ENERGY

LEAD DEPARTMENTS: Development Services Department, Environmental Services Department, Economic Development Department

GENERAL PLAN POLICIES: CE-A.2, CE-A.5, CE-A.6, CE-I.5, CE-I.10, CE-I.11 UD-A.4

GOAL:

Achieve 100% renewable energy city-wide by 2035.

ACTION 2.1: **PHASE 2**

Present to City Council for consideration a Community Choice Aggregation (CCA) or another program that increases the renewable energy supply.*

TARGET:

Add additional renewable electricity supply to achieve 100% renewable electricity by 2035 city-wide.

GHG REDUCTIONS:

2020	2035
N/A MT/CO_2e	1,592,878 MT/CO_2e

SUPPORTING MEASURES FOR CLEAN AND RENEWABLE ENERGY:

- Complete a citywide Community Choice Aggregation Feasibility Study, which would include timelines for implementation and analyze potential costs.
- Implement General Plan Policy CE-A.5 to achieve net zero energy consumption by employing sustainable or "green" building techniques for the construction and operation of buildings.
- Support the State's implementation of the Green Tariff Shared Renewables Program.
- Establish policies, programs and ordinances that facilitate and promote siting of new onsite photovoltaic energy generation and energy storage systems.
- Provide adequate funding and resources to meet increased demand for solar photovoltaic and energy storage permitting.
- Encourage solar photovoltaic installations through implementation of a professional-certification permitting program.

*** Note: The City's renewable energy program should include presenting an ordinance to City Council to require new residential and non-residential construction to install conduit for future photovoltaics and electric vehicle (EV) charging stations, and to install plumbing for future solar water heating. Further, should the CCA Program or another program not be implemented, the City will explore the option of utilizing renewable energy credits (RECs) to contribute toward the 100% renewable energy target. Efforts should be local in nature to benefit local renewable energy businesses, create jobs, and increase resiliency for the City.**

STRATEGY 2: CLEAN & RENEWABLE ENERGY

GOAL:

Increase municipal zero emissions vehicles.

ACTION 2.2: **PHASE 1**

Present to City Council for consideration an update to City Administrative Regulation 90.73 to increase the number of municipal zero emissions vehicles.

TARGET:

Increase the number of zero emissions vehicles in the municipal fleet to 50% by 2020 and 90% by 2035.

GHG REDUCTIONS:

2020	2035
12,144 MT/CO_2e	21,859 MT/CO_2e

GOAL:

Convert existing diesel municipal solid waste collection trucks to compressed natural gas or other alternative low emission fuels.

ACTION 2.3: **PHASE 1**

Present to City Council for consideration a Municipal Alternative Fuel Policy.

TARGET:

100% conversion from diesel fuel used by municipal solid waste collection trucks to compressed natural gas or other alternative low emission fuels by 2035.

GHG REDUCTIONS:

2020	2035
2,018 MT/CO_2e	10,144 MT/CO_2e

SUPPORTING MEASURES FOR CLEAN AND RENEWABLE ENERGY:

- Consider updating regulations for alternative fuel and zero emissions vehicle requirements for the City's vehicle fleet.
- Consider an integrated transportation strategy that combines zero emissions vehicle deployment and infrastructure.
- Present to City Council for consideration an Electric Vehicle Charging Plan.

STRATEGY 3: BICYCLING, WALKING, TRANSIT & LAND USE

LEAD DEPARTMENTS: Transportation and Storm Water, Planning, General Services, Development Services, Purchasing and Contracting, Economic Development, Environmental Services Departments

GENERAL PLAN POLICIES: CE-A.2, ME-E.6, ME-F.5, ME-F.6, LU-A.7, ME-B.9, CE-F.1, CE-F.5, ME-C.4

GOAL:

Increase the use of mass transit.

ACTION 3.1: **PHASES 1, 2 & 3**

Implement the General Plan's Mobility Element and the City of Villages Strategy in Transit Priority Areas* to increase the use of transit.

TARGET:

Achieve mass transit mode share of 12% by 2020 and 25% by 2035 in Transit Priority Areas.

GHG REDUCTIONS:

2020	2035
119,234 MT/CO_2e	213,573 MT/CO_2e

GOAL:

Increase commuter walking opportunities.

ACTION 3.2: **PHASES 1, 2 & 3**

Implement pedestrian improvements in Transit Priority Areas to increase commuter walking opportunities.

TARGET:

Achieve walking commuter mode share of 4% by 2020 and 7% by 2035 in Transit Priority Areas.

GHG REDUCTIONS:

2020	2035
1,092 MT/CO_2e	1,488 MT/CO_2e

***TRANSIT PRIORITY AREA:** The Transit Priority Areas map is based on the adopted SANDAG 2050 Regional Transportation Plan (RTP). The RTP is currently being updated as a part of the San Diego Forward Regional Plan . The Transit Priorities Area map will be updated to reflect the updated RTP following adoption by the SANDAG Board, which is anticipated to occur in the fall of 2015.

SB 743 established Section 21099 of the California Public Resources Code (CPRC), which states: "Transit priority area" means "an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to Section 450.216 or 450.322 of Title 23 of the Code of Federal Regulations."

Major Transit Stop, as defined in CPRC Section 21064.3, means: a site containing an existing rail transit station , a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes each having a frequency of service of 15 minutes or less during the morning and afternoon peak commute periods. - See **Appendix B**

STRATEGY 3: BICYCLING, WALKING, TRANSIT & LAND USE

GOAL:

Increase commuter bicycling opportunities.

ACTION 3.3: **PHASES 1, 2 & 3**

Implement the City of San Diego's Bicycle Master Plan to increase commuter bicycling opportunities.

TARGET:

Achieve 6% bicycle commuter mode share by 2020 and 18% mode share by 2035 in Transit Priority Areas.

GHG REDUCTIONS:

2020	2035
19,077 MT/CO_2e	50,574 MT/CO_2e

GOAL:

Reduce vehicle fuel consumption.

ACTION 3.4: **PHASE 2**

Implement a Traffic Signal Master Plan to retime traffic signals to reduce vehicle fuel consumption.

TARGET:

Retime 200 traffic signals by 2020.

GHG REDUCTIONS:

2020	2035
11,024 MT/CO_2e	8,508 MT/CO_2e

ACTION 3.5: **PHASE 2**

Implement a Roundabouts Master Plan to install roundabouts to reduce vehicle fuel consumption.

TARGET:

Install roundabouts at 15 intersections by 2020 and an additional 20 intersections by 2035.

GHG REDUCTIONS:

2020	2035
2,110 MT/CO_2e	2,172 MT/CO_2e

STRATEGY 3: BICYCLING, WALKING, TRANSIT & LAND USE

GOAL:

Promote effective land use to reduce vehicle miles traveled.

ACTION 3.6: **PHASES 1, 2 & 3**

Implement transit-oriented development within Transit Priority Areas.

TARGET:

Reduce average vehicle commute distance by two miles through implementation of the General Plan City of Villages Strategy by 2035.

GHG REDUCTIONS:

2020	2035
0 MT/CO_2e	109,576 MT/CO_2e

SUPPORTING MEASURES FOR BICYCLING, WALKING, TRANSIT & LAND USE:

- Implement bicycle improvements concurrent with street re-surfacing projects, including lane diets, green bike lanes, sharrows, and buffered bike lanes.
- Implement a bicycle sharing program with DecoBikes. Reduce the "1 mile" barrier gap by ensuring that further expansion of the bike share program is designed and implemented to reduce the distance needed to travel between transit stops and destinations.
- Identify and address gaps in the City's pedestrian network and opportunities for improved pedestrian crossings, using the City's Pedestrian Master Plan and the City's sidewalk assessment.
- Adopt City portions of SANDAG's forthcoming first mile/last mile initiative and incorporate Safe Routes to Transit strategies in Transit Priority Areas.
- Coordinate pedestrian counting programs with SANDAG & SDSU Active Transportation Research Programs.
- Develop a Parking Plan to include measures such as "unbundled parking" for nonresidential and residential sectors in urban areas.
- Prepare a Commuter Report with measures to increase commuting by transit for City employees.
- Achieve better walkability and transit-supportive densities by locating a majority of all new residential development within Transit Priority Areas.
- Develop a new priority ranking for capital improvement projects in Transit Priority Areas that will be integrated into Council Policy 800-14, Community Development Block Grant and other grant opportunities, and Public Facilities Financing Plans. See Ch. 4 Social Equity & Job Creation..
- In addition to commuting, implement infrastructure improvements including "complete streets" to facilitate alternative transportation modes for all travel trips.
- The most recent version of the California Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen tool will be used as one method to identify and help prioritize, when possible, underserved communities in census tracts ranking in the top 30% of CalEnviroScreen scores, which may be locally normalized, for transit-related infrastructure improvements and capital improvements.

STRATEGY 4: ZERO WASTE (GAS & WASTE MANAGEMENT)

LEAD DEPARTMENTS: Environmental Services Department, Public Utilities Department

GENERAL PLAN POLICIES: CE-A.2, CE-A.8, CE-A.9, CE-E.6, CE-M.3, CE-N.4, CE-N.7, PF-I.1, PF-I.2

GOAL:

Divert solid waste and capture landfill methane gas emissions.

ACTION 4.1: **PHASE 1**

Enact the City's Zero Waste Plan, and implement landfill gas collection operational procedures in compliance with the California Air Resources Board's Landfill Methane Capture regulations.

TARGET:

Divert 75% of solid waste by 2020 and 90% by 2035. Capture 80% of remaining landfill emissions by 2020 and 90% by 2035.

GHG REDUCTIONS:

2020	2035
154,467 MT/CO_2e	344,213 MT/CO_2e

GOAL:

Capture methane gas from wastewater treatment.

ACTION 4.2: **PHASES 2**

Implement operational procedures to capture methane gas from wastewater treatment.

TARGET:

Capture 98% wastewater treatment gases by 2035.

GHG REDUCTIONS:

2020	2035
16,424 MT/CO_2e	18,735 MT/CO_2e

SUPPORTING MEASURES FOR ZERO WASTE:

- Develop a Resource Recovery Center and "one-stop shop" at Miramar Landfill that provides opportunities to maximize waste diversion.
- Convert curb side recycling and curb side greenery collection programs to a weekly basis and add kitchen scraps to greenery.

STRATEGY 5: CLIMATE RESILIENCY

LEAD DEPARTMENTS: Development Services, Planning Department, Parks and Recreation Department, Public Works Deparment

GENERAL PLAN POLICIES: CE-A.2, CE-J.1, CE-J.2, CE-J.3

GOAL:

Increase urban tree canopy coverage.*

ACTION 5.1: **PHASE 2**

Present to City Council for consideration a city-wide Urban Tree Planting Program. The program shall include water conservation measures to minimize the water use for tree plantings. The measures should include planting drought-tolerant and native trees, and prioritizing tree plantings in areas with recycled water and greywater infrastructure.

TARGET:

Achieve 15% urban tree canopy coverage by 2020 and 35% urban tree coverage by 2035.

GHG REDUCTIONS:

2020	2035
43,839 MT/CO_2e	102,290 MT/CO_2e

SUPPORTING MEASURES FOR CLIMATE RESILIENCY:

- Develop a regional (Western San Diego County) Urban Tree Canopy Assessment in collaboration with other regional jurisdictions and SANDAG.
- Prepare a Parks Master Plan that prioritizes parks in underserved communities.
- Hire an Urban Forest Program Manager.
- Plan for the long-term maintenance of additional trees and ensure sufficient staff and funding are available.
- Complete the Urban Forest Management Plan and present to City Council for adoption.

*** URBAN TREE CANOPY COVERAGE**

Urban tree canopy refers to the tree crowns that cover the ground when viewed from above. Typically, urban tree canopy coverage is measured by using high definition aerial imagery to calculate how much of the City is "shaded" by trees. Citywide tree canopy coverage is generated by street trees, trees in parks, open space, and private residential, commercial, and industrial areas.

MONITORING & REPORTING
Measure 1: CAP Annual Monitoring Report

IMPLEMENTING MECHANISMS:	IMPLEMENTATION PHASES:

1.1 Sustainability Program Manager

As a companion item to the CAP, the Mayor and City Council have established the position of Sustainability Program Manager to oversee the implementation and monitoring of all actions outlined in the CAP. To increase efficiency and reduce costs, the City will integrate these actions into the context of existing workloads and programs whenever possible. The Program Manager will establish an interdisciplinary team of staff from various City departments to coordinate implementation efforts and coordinate city-wide progress. The position will also oversee the development of the climate adaptation plan and updates to this plan.

2015-2017	2018-2020	2021-2035
✓		

1.2 Annual Monitoring Report

Staff will conduct an inventory of community-wide GHG emissions and develop an Annual Monitoring Report that will include specific actions, proposed outcomes and a timeline with milestones to track success in meeting 2020 and 2035 targets.

2015-2017	2018-2020	2021-2035
✓	✓	✓

1.3 Citywide data collection and sharing

The City commits to sharing data with other government entities, academic institutions, military, corporate, and civic organizations. The City may be limited in its ability to share certain types of data (i.e. energy usage by individuals).

2015-2017	2018-2020	2021-2035
✓	✓	✓

1.4 Amend policies, plans, and recommendations

Staff will annually evaluate city policies, plans (including the CAP) and codes as needed to ensure the CAP reduction targets are met. Any actions requiring City Council approval will be brought back to City Council for consideration. Amendment of the CAP will be required if it is not meeting the GHG emission reductions outlined in the CAP or otherwise required by law. Additionally, it is anticipated that an update of the CAP will occur by 2020.

2015-2017	2018-2020	2021-2035
✓	✓	✓

MONITORING & REPORTING
Measure 2: Carbon Inventory Verification

IMPLEMENTING MECHANISMS:	IMPLEMENTATION PHASES:

2.1 Third-party Verification

The City's Environmental Services Department will complete an annual carbon (GHG) inventory as part of the Annual Monitoring Report to be verified through a neutral third-party to ensure it is accurate and complete. Voluntarily submitting the carbon inventory for third-party verification will lend credibility to the CAP and provide assurance to the public of a valid product.

2015-2017	2018-2020	2021-2035
✓	✓	✓

MONITORING & REPORTING
Measure 3: Social Equity and Job Monitoring

IMPLEMENTING MECHANISMS:	IMPLEMENTATION PHASES:

3.1 Annual Jobs Monitoring

As part of the Annual Monitoring Report (AMR), staff will report on local employment related to the Climate Action Plan. To the extent feasible, the AMR will account for the total number of jobs, associated wages, new jobs, and new work for existing firms in the fields of energy efficiency, clean tech, renewable energy, etc. (fields associated with the Climate Action Plan goals). Staff will work with organizations in the region and state currently reporting on this topic to determine the best methodology and process for to use in order to maximize, and not duplicate, existing reporting efforts.

2015-2017	2018-2020	2021-2035
✓	✓	✓

3.2 Social Equity Reporting

Monitoring of social equity will also be a component of the CAP annual monitoring report (AMR). This will include, to the extent feasible, accounting for capital improvement and grant fund expenditures in underserved communities. As this is a new area of reporting for most cities in the U.S., staff will develop the methodology for reporting on social equity as related to implementation of climate action plans and refine as needed, with stakeholder input from organizations in the region and others within the U.S with expertise in this area.

2015-2017	2018-2020	2021-2035
✓	✓	✓

City of San Diego Wastewater Otay Water Treatment Plant

CHAPTER 4

SOCIAL EQUITY AND JOB CREATION

Teralta Park - City Heights

Job Creation

There are considerable economic benefits of implementing CAP strategies in the San Diego community. CAP strategies intended to reduce resource consumption (e.g., energy efficiency measures) may save money for individuals, families, and businesses. In addition, CAP strategies are intended to promote job creation through capital improvements and corresponding research, development, and innovation. These jobs are primarily in high-growth "green job" or "clean tech" with corresponding well-paying wages.

A recent study published by the Natural Resources Defense Council projected that stricter emissions standards could net 210,000 national jobs by 2020 (Stanton et al. 2013). California is poised to capture a large share of these new jobs. As illustrated by Table 4.1, California is the national leader in cleantech job creation. In the second quarter of 2013, the state led the way nationally in green project and job announcements with twelve new wind, solar, biofuels, and transportation projects that could cumulatively create more than 9,000 jobs (E2 2013). E2 reported that California's renewable energy standards will ensure more green jobs will be created in the future, as one-third of all power used in the State will have to come from renewable sources by 2020.

Per the 2014 California Green Innovation Index (6th edition, Next 10) The San Diego region experienced the second fastest growth in distributed solar installations through the California Solar Initiative (CSI) between 2012 and 2013 (+11%), and had a total of about 137 MW installed between 2007 and 2013. The San Diego region also experienced the fastest growth in Advanced Materials jobs between January 2011 and 2012 (+84%) and had the third highest concentration of jobs in the clean economy (about 27,000 or 14% of the state total) and second highest concentration of Clean Transportation jobs.

Table 4.1: Clean Tech Job Activity: Top 15 U.S. Metro Areas

1. San Francisco, CA
2. Los Angeles, CA
3. Boston, MA
4. New York, NY
5. Denver, CO
6. Washington D.C.
7. San Diego, CA
8. Houston, TX
9. Chicago, IL
10. Austin, TX
11. Seattle, WA
12. Atlanta, GA
13. Dallas, TX
14. Portland, OR
15. Sacramento, CA

Source: Clean Edge, 2010

The San Diego Workforce Partnership's "Green Jobs Outlook for San Diego" revealed there were almost 340,000 green jobs in San Diego as of 2011. These numbers are consistent with San Diego's transformation into a hub of green technology innovation where approximately 840 cluster companies were located in 2013 (Cleantech San Diego 2013). Over 20 percent of these companies are solar power focused. These firms offer a range of job opportunities ranging from installation, project management, finance, and research. Clearly, climate action planning and implementation have, and will continue to, lead to the creation of "green jobs."

What is the Value of Green Jobs?

1. Green Jobs are Local Jobs

Implementation of San Diego's Climate Action Plan strategies can create good, local jobs. Energy efficiency and climate-related projects are performed locally, thereby requiring a San Diego-based labor force. These jobs will provide direct benefits to workers in the community. As these workers spend their "green job" income, local businesses benefit from these additional expenditures, increasing demand for products, and potentially leading to additional jobs to support the demand. As such, each new green job can blossom into additional local jobs.

2. Green Jobs are Predominately Middle Class Jobs

Green jobs pay well and provide opportunities for advancement along a career track of increasing skills and wages. The promotion of green jobs is consistent with the White House's Task Force on the Middle Class mandate: to find, highlight, and implement solutions to the economic challenges facing the American middle class. Moreover, the Federal government believes green jobs are an outgrowth of a larger movement to reform the way energy is created and used. The Obama Administration promotes green jobs as they represent a growth sector that provides good jobs (Middle Class Task Force 2009).

3. Green Jobs can Provide Pathways out of Poverty

Many green jobs require more education than high school, but less than a four-year degree and are well within reach for lower-skilled and low-income workers as long as they have access to effective training programs and appropriate supports. **Table 4.2** shows green job wages, with or without a college degree.

Table 4.2: Clean Tech Compensation

Job Title	Industry	Median Pay	Typical Job Level	Typical Degree
Electrical/Electronic Equipment Assembler		$30,300	Mid-Level	HS/AD
Network Operations Center Technician	Smart Grid	$45,100	Mid-Level	HS/AD
Solar Energy System Installer	Solar PV	$37,700	Entry Level	HS/AD
Solar Fabrication Technician	Solar PV	$45,800	Entry Level	HS/AD
Wind Turbine Technician	Wind Power	$48,300	Entry Level	HS/AD
Sheet Metal Worker	Wind Power	$51,500	Mid-Level	HS/AD
Construction Superintendent	Wind Power	$76,700	Senior Level	HS/AD
Solar Energy/Solar Power Project Developer	Solar PV	$62,300	Entry Level	BD
Utility Program Manager	Smart Grid	$77,900	Mid-Level	BD
Solar Installation Foreman	Solar PV	$49,200	Entry-Level	BD
Research and Development Lab Technician	Solar PV	$40,900	Entry-Level	BD

Source: Clean Edge, 2010

Typical Job Level - There are three categories: 1) Entry-Level Positions where workers typically have less than 5 years of experience, 2) Mid-Level Positions where workers typically have between 5 and 10 years of experience, and 3) Senior-Level Positions where workers typically have more than 10 years of experience.

Typical Degree Level - This is the degree held by the majority of respondents.
HS/AD = High School Diploma/Associate's Degree BD = Bachelor's Degree

Job Training

Many green jobs are brand new to the economy. Other green jobs have existed in the past, but have transformed and require new knowledge (e.g., Solar panel installers). Most, but not all, green jobs will require specific skillsets to meet the green economy demands.

For workers that do not have the required skills to obtain these new jobs, there are several training options available through Univeristy of California San Diego and extension, San Diego State University, San Diego State University extension, and the large system of community colleges. San Diego workers can obtain career assistance with "green jobs" from the California Economic Development Department, Cal JOBS, and the San Diego Workforce Partnership. In addition, local apprenticeship programs are available including the International Brotherhood of Electrical Workers (IBEW) San Diego Electrical Training Center, which provides hands-on training for new apprentices or continuing education for experienced workers, the Associated General Contractors of America, San Diego Chapter, Inc. (AGC) on-the-job training apprenticeship program, and the Associated Builders and Contractors (ABC)formal apprenticeship training programs. These programs enable the local contractors to diversify and compete in new markets that help ensure growth in the industry. Additionally, outreach should ensure that disadvantaged communities are aware of and properly trained to meet the needs of jobs in the new green economy.

Many professionals will be trained via the state-certified apprenticeship system for construction workers. These four- to five-year

training programs are largely self-funded by employers and workers.

Social Equity

The benefits of the CAP are intended to be shared equally, fairly, and with lack of prejudice among all persons citywide. The City's General Plan recognizes the importance of addressing environmental justice through equal access to and meaningful participation in the decision-making process and the need to ensure the equitable distribution of public facilities and services. The General Plan includes policies to pursue environmental justice in the planning process through greater community participation, to prioritize and allocate citywide resources to provide public facilities and services to communities in need, and to improve mobility options and accessibility for the non-driving elderly, disabled, low-income, and other members of the population.

To implement the General Plan and provide an equitable distribution of public facilities, infrastructure, and services the City developed Council Policy 800-14 which sets the City's priorities for the City's Capital Improvements Program (CIP). The policy prioritizes projects in under-served communities including those with low income households, low community engagement and low mobility or access to transportation systems based on SANDAG census tract. The City interprets the Council Policy to include the use of the California Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen tool to identify under-served communities and prioritize the CIP in census tracts ranking in the top 30% of CalEnviroScreen scores, which may be locally normalized. The policy also prioritizes projects located in areas eligible for the Community Development Block Grant funds, and projects located within a half mile of affordable housing.

Further, using the State of California Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen, the City will prioritize pursuing future grant opportunities within these communities in order to help achieve the goals and policies of the CAP. The City's prioritization will coincide with the ongoing state and regional efforts to focus grant resources in these areas.

The City also recognizes that CAP measures will not solve all climate-related health issues for disadvantaged communities. These areas will also need special assistance adapting to future climatic changes. The climate adaptation plan (which is described in **Chapter 5: Adaptation**) will identify the vulnerabilities and risks specifically associated with communities of need.

The City's Role as a Leader

While the City may not be able to promise new jobs for, or change the underlying socioeconomic factors of, disadvantaged populations (e.g., age, health status), it can take action to provide equal access to opportunities for economic advancement and promotion of social equity. To provide support to disadvantaged communities and promote equitable job growth and economic opportunity, the CAP has identified specific socioeconomic-specific goals:

- Implementation of the City's Economic Development Strategy (currently 2014 - 2016) with a mission to create a wide spectrum of job opportunities for San Diego residents by expanding the City's economic base and increasing local economic activity, and to generate new tax revenues for essential public services by expanding the City's tax base.

- The City's Economic Development Department proactively works with businesses in targeted industries to provide assistance and incentives that result in the retention and creation of jobs and investment in San Diego. The City often partners with local workforce development agencies (e.g., San Diego Workforce Partnership) and colleges to identify resources for workforce development opportunities for disadvantaged populations.

- Programs should include performance goals and data tracking for the quality of jobs created and the demographic and geographic distribution of workers.

- Provide efficiency and renewable energy training for the City employees responsible for the management of City facilities.
- Prioritize programs and actions to reduce emissions in disadvantaged communities that rank in the top 25 percent of CalEnviroScreen's ranking for San Diego region communities.
- Encourage local businesses working on climate action-related projects and programs to give advanced notice of job opportunities to San Diego community members through local community-based organizations, educational institutions, and media outlets.
- Continue to utilize the state-certified apprenticeship system for the training of construction workers.
- Continue to provide opportunities to disadvantaged populations for municipal projects consistent with the City's Local Small Business Enterprise Ordinance (Ordinance 19922, 2/4/2010).
- Maximize opportunities for workforce development by using existing programs to create career pathways.
- Ensure that all climate action-related work done through City programs comply with the City of San Diego's Prevailing Wage Ordinance, where applicable (Ordinance 20299, 9/26/2013).

Native Plants - Chollas Creek

Jacobs Center - Encanto

CHAPTER 5

ADAPTATION

Mission Valley Center - Trolley Bridge

Why should San Diego adapt now?

The City will develop a stand alone climate adaptation plan that will integrate and build upon the strategies and measures in the CAP.

Some degree of climate change will occur regardless of the City's effort to reduce and mitigate GHG emissions. As a result, the City will need to adapt to these changes within the context of the community's environmental and socioeconomic system. According to the Intergovernmental Panel on Climate Change (IPCC), climate adaptation refers to the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC 2007).

The City recognizes that climate adaptation is a core component of its overall response to the impacts of climate change. Development of an actionable adaptation plan will allow the City to focus and prioritize its limited resources, take advantage of early action and planning, and engage in effective collaboration with other local, state and federal agencies that are moving forward with similar planning efforts.

The integration of the climate adaptation plan and CAP should lead to substantial co-benefits whereby individual measures lead to both reduction of GHGs and adaptation to the impacts of climate change. The forthcoming climate adaptation plan will prioritize adaptation resources and timing based on a risk vulnerability rating that takes into account both the likelihood of specific impacts occurring and the severity of those impacts on threatened natural resources, human health, and critical infrastructure. As mentioned in Chapter 4, the vulnerabilities and risks associated with communities of need will be identified.

What is the difference between the Climate Action Plan and a *climate adaptation plan*?

Adaptation efforts seek to reduce vulnerability to projected climate changes and increase the local capacity to adapt (Turner et al., 2003). Adaptation aims to minimize the actual or expected effects of climate change, whereas the CAP includes actions to reduce the creation of greenhouse gases.

Currently, the City does not have the necessary resources to develop an adequate plan that would fully assess the risks and vulnerabilities, develop adaptation strategies, and prepare the community for looming heat waves, sea-level rise, impacts on infrastructure, etc. However, the City is aggressively pursuing additional funding from state and federal sources to develop a comprehensive adaptation plan that will meet the needs of the community. In the meantime, the City will continue to collaborate other local, regional, state, and federal agencies to being to prepare for a changing climate.

Climate Impacts to San Diego

Research from state, regional, and local agencies indicate that the City of San Diego faces serious vulnerabilities from climate change impacts. One such study, commissioned by the San Diego Foundation, titled "San Diego's Changing Climate: A Regional Wake-up Call," was the first of its kind to identify impacts specific to the City of San Diego (San Diego Foundation 2007). The potential impacts include, but are not limited to the following:


2007 Witch Creek Fire

Increased temperatures

- The City will see hotter and drier days and more frequent, prolonged heat waves.

Reduction in air quality

- Hotter and drier days create more air pollution by raising ozone levels and this can exacerbate asthma and other respiratory and cardiovascular diseases.

Introduction of new public health issues

- Warmer temperatures year-round could lead to growing mosquito populations, increasing the regional occurrence of West Nile virus and potentially introducing tropical diseases such as Malaria and Dengue Fever.

Reductions in fresh water

- Water and energy demand will increase while extended and more frequent droughts will cause traditional sources of fresh water supplies to diminish.

Increased rate of wildfires

- Drier weather may increase the frequency and size of wildfires.

Rising sea levels

- Projected sea level rise, coastal erosion, and increasing storm surges may cause fragile sea cliffs to collapse, shrink beaches, and destroy coastal property and ecosystems.

Negative impacts on wildlife

- Native plants and species may be lost forever as entire ecosystems are challenged.

California Adaptation Efforts

More than eight years have passed since publication of the San Diego Foundation's ground-breaking report. It has been almost ten years since approval of 2005 Climate Protection Action Plan (CPAP). Over that period, the risks poised by climate change's impacts have not diminished.

State, regional, and other private entities also recognized the seriousness of the situation and have taken proactive steps to address climate change issues. Several efforts have been, or are, well underway including detailed vulnerability assessments, risk assessments, adaptation policies, and adaptation policy guides for local governments. The City of San Diego will benefit from these resources as it develops its own climate adaptation strategy. Past and current efforts, from which the City can draw, include:

Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future: Published in 2012 by the National Research Council, this Report explains that sea level along the U.S. west coast is affected by a number of factors. These include: climate patterns such as the El Nino, effects from the melting of modern and ancient ice sheets, and geologic processes, such as plate tectonics.

Draft Sea-Level Rise Policy Guidance: Authored by the California Coastal Commission and released in October 2013, provides an overview of best available science on sea-level rise for California and recommended steps for addressing sea-level rise in Coastal Commission planning and regulatory actions.

Executive Order S-13-08: Signed in 2008, the executive order required the preparation of a "California Sea Level Rise Assessment Report" (published in 2009) and requires that state agencies planning construction projects in areas vulnerable to sea level rise consider and address a range of scenarios for 2050 and 2100 coastal inundation.

Preparing for the Impacts of Climate Change in California - Opportunities and Constraints for Adaptation: published by the California Climate Change Center in response to Executive Order S-3-05, this paper examines California's opportunities and constraints for managing the impacts of climate change and provides recommendations for how government, research, and civil society can help California most effectively prepare for climate change impacts.

Safeguarding California Plan (formerly California Climate Adaptation Strategy): Adopted in 2009 and more recently updated in 2013, summarizes climate change impacts and recommends adaptation strategies across seven sectors: Public Health, Biodiversity, Coastal Resources, Water, Agriculture, Forestry, and Transportation and Energy (State of California 2009).

The Adaptation Planning Guide: Included in the California Climate Adaptation Strategy and updated in 2012, provides a decision-making framework intended for use by local and regional stakeholders to aid in the interpretation of climate science and to develop a systematic rationale for reducing risks caused by climate change (State of California 2012).

Fourth Climate Change Assessment: These assessments (third completed in 2012) down scaled global climate data to regionally relevant scales and provides information and recommendations on risks, impacts, and additional research needed.

International Council for Local Environmental Initiatives: Released in 2012, the "Sea Level Rise Adaptation Strategy for San Diego Bay" report provided the nation's first comprehensive vulnerability assessments and recommendations to build resiliency for community-wide infrastructure in San Diego.

Cal-Adapt: The California Natural Resources Agency and the California Energy Commission released a web-based tool that enables city and county planners, government agencies, and the public to identify potential climate change risks in specific areas throughout California.

Co-benefits of Adaptation:

- **Agricultural and Food System Security**
- **Biodiversity and Habitat**
- **Community Education**
- **Economic Stability**
- **Emergency Management and Response**
- **Energy Resources**
- **Infrastructure and Public Facilities**
- **Job Creation and Local Investment**
- **Ocean and Coastal Ecosystem Health**
- **Public Health**
- **Transportation**
- **Social Equity**
- **Urban Forestry and Sequestration**
- **Water Resources**

Chollas Creek Bridge

Local Vulnerabilities

The City's General Plan (2008) and community plans (multiple years) have important roles in the adaptation planning process. The General Plan lays out the policy framework for addressing climate change and the community plans have the purview to make site-specific land use and design recommendations. These plans can be utilized to help reduce the impacts from a changing climate.

Examples of planning-related adaptation strategies include:

- Designating land for a full range of uses, including open spaces and high-density areas where appropriate.
- Designing a multi-modal mobility system with multiple emergency routes.
- Fostering urban agriculture to increase food system security.
- Implementing tree-planting incentives, ordinances, and programs to save energy, sequester carbon, and reduce the urban heat island effect.
- Requiring appropriate setbacks from the coast in areas subject to sea level rise.
- Requiring developers to incorporate low-impact development tools, such as natural drainage basins and water features, to capture storm water in areas vulnerable to increased flood risk.
- Implementing brush management programs to reduce wildfire risk in fire-prone areas.
- Increasing conservation and efficiency in water use to reduce reliance on imported water and drought impacts.
- Coordinating with urban farmers and the regional San Diego County Farm Bureau to promote alternative irrigation measures or other protective recommendations.

There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction."

- Klaus Jacob, Lamont-Doherty Earth Observatory, Columbia University. Chair, Climate Adaptation Group

To adapt to the changing climate, specific sectors will require focused solutions. The following section illustrates vulnerabilities that should be considered for inclusion in the forthcoming City of San Diego climate adaptation plan.

Protect Public Health and Safety

Understanding how climate change impacts may affect human health and developing responsive solutions to protect vulnerable populations is essential. For example:

- Diminished air quality from wildfires or excessive ozone can be dangerous for asthma sufferers.
- Hotter temperatures can cause heat stress and is potentially fatal for vulnerable populations such as the elderly, the young, and outdoor-workers.
- Flooding or coastal inundation events could cause injury or property damage.

Maintain Water Supply and Services

Adequate water supply is a fundamental requirement for every community. Like many other Southern California cities, San Diego is challenged by an ever-increasing demand for water coupled with a projected decline in supply. By 2035 the San Diego County Water Authority projects an increase in total normal water demand of 20 percent (including future conservation, demand associated with projected near-term annexations, and accelerated forecasted growth) from the average demand that occurred over the period 2005-2010 (SDCWA 2010). Currently, 85 to 90 percent of the City of San Diego's water supply is met by imported water (City of San Diego 2013).

Protect and Maintain Urban Infrastructure and Community Services

The public infrastructure and services (e.g., police, fire services, drainage, and sewer systems) form the structural and functional backbone of the City. It is important to identify where the risks are greatest and which critical assets are most vulnerable. This will aid in prioritizing assets and actions to maintain service resilience.

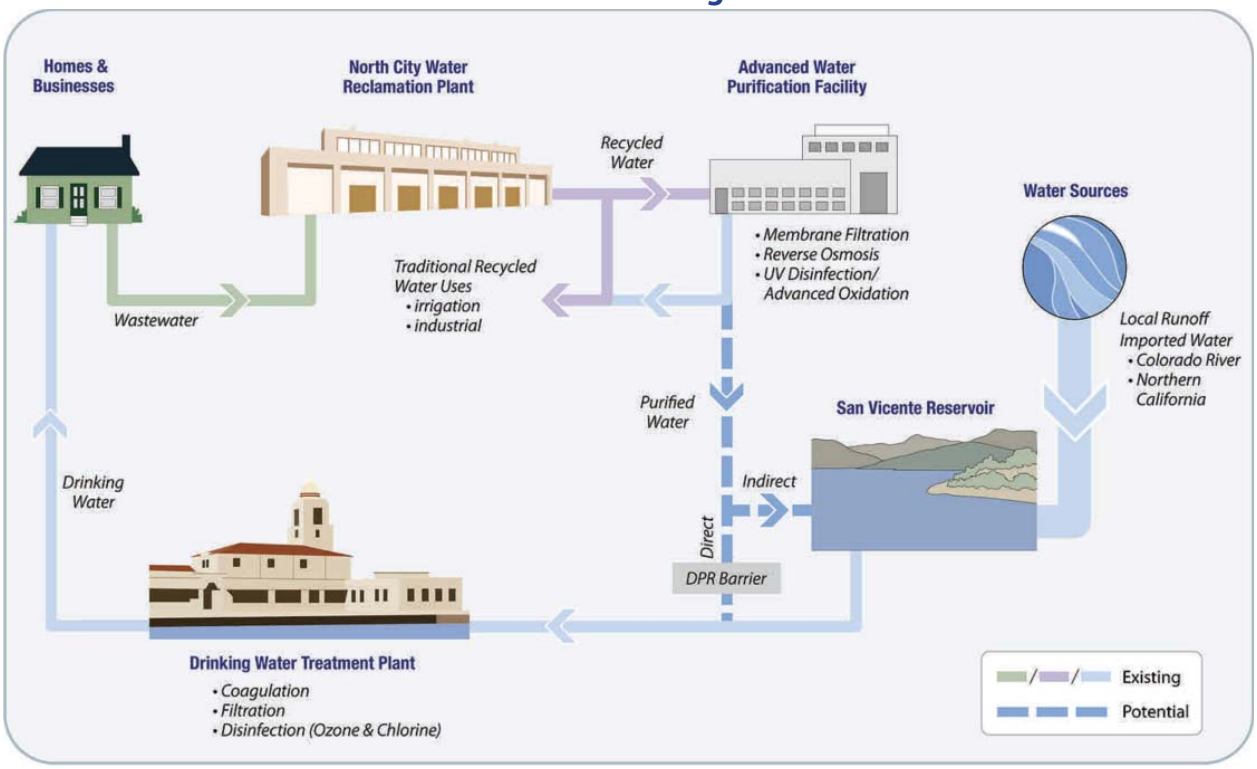
San Diego's Water Supply Choices and Related Carbon Emissions

With limited fresh water supplies locally, San Diego is pioneering the development of alternative water supplies from potable reuse. The City is actively pursuing the viability of constructing a multi-phased potable reuse project that, when completed, is anticipated to provide approximately a third of San Diego's water supplies by 2035.

Pure Water San Diego is the City's 20-year program to provide a safe, reliable and cost-effective drinking water supply for San Diego. The program includes the construction of water purification facilities, pipelines, pump stations, ongoing testing protocols, and an education and outreach program.

San Diego's production of Pure Water is expected to increase energy consumption by the San Diego Public Utilities Department over current operations. However, since Pure Water would replace purchases of imported water (currently representing 85% of San Diego's water supplies), it is appropriate to contrast the embedded energy in an acre-foot (AF) of purified water with that of existing imported water supplies. According to the City of San Diego's 2013 Water Purification Demonstration Project Report, purified water produced at the City's North City Reclamation Facility and then pumped up to the San Vicente reservoir would require approximately 2,500 kWh/AF. By comparison, imported water requires a range of 2,000 kWh/AF to 3,300 kWh/AF of energy, depending on the blend of water from the Colorado River or the Bay-Delta in Northern California. Therefore, the embedded energy of indirect potable reuse is equivalent to that of imported water.*

Pure Water Program



* Source: City of San Diego's 2013 Water Purification Demonstration Project Report.

San Diego Green Streets

The term "Green Streets" is used in many contexts, and it is important to note that is a storm water and low-impact development tool for private and public projects. Compliance with the new Municipal Stormwater Permit will require significant increases in implementation of non-structural, or activity-based strategies, such as education and enforcement, in addition to structural control strategies, such as grassy swales and infiltration basins. One such structural strategy that the City is employing is called "green streets." Storm water treatment techniques that may be included in green streets are porous pavement, infiltration galleries in landscape strips, trash collection devices, or other techniques that filter or infiltrate runoff within the right of way. Green street features may be incorporated into new roadway construction or retrofitted into existing streets.

Example of a Green Street

Protect Environmental Health

Healthy natural water systems, vegetation areas, wetlands, estuaries and the associated biome are important assets to the region. In San Diego, a healthy environment also increases the quality of life for residents and workers, and attracts tourists. Beyond the detrimental impacts on natural plant and wildlife communities, the decline in environmental health would have negative social and economic effects. Balancing the needs of the natural environment with those of the community has always been a challenge, and climate change will put more pressure on the competing systems.

Protect Open Space, Parks and Recreation

Parks and open space are important resources that contribute to San Diego's culture, character, and economy. Green spaces offer recreational and tourism opportunities. They also serve as a climate change adaptation resource where they can alleviate the heat island effect and potentially reduce the impact of flooding.

Coastal Management and Protection

Numerous studies focusing on sea level rise as a result of climate change have been released, including one produced by Local Governments for Sustainability (ICLEI) in 2012 titled "Sea Level Rise Adaptation Strategy for San Diego Bay." The consensus from these studies is that, without substantial reductions in GHG emissions, global temperature increases will likely lead to a rise in sea levels, which will need to be proactively managed.

Urban Forest Management and Local Food Production

Local and regional agriculture is a major driver in the national economy. Producers are responding to increasing demand for local and regional food by increasing production, creating new markets, and launching new businesses. Most recently in September 2013, California Governor Edmund G. Brown Jr. signed several bills to expand access to fresh, locally grown food in communities across California. "This farm to fork legislation expands access to fresh, local produce and will help make our communities healthier," said Governor Brown (State of California 2014).

Close to 80 percent of the U.S. population lives in urban areas and depends on the essential ecological, economic, and social benefits provided by urban trees and forests. (USDA 2010). The City of San Diego recognizes this and has prioritized the expansion of the urban forest as a critical strategy to reduce GHG emissions.

It is important to recognize that increased urban tree coverage and local food production will require increased water usage.

Building and Occupant Readiness

The City's General Plan (2008), community plans and Building Code enforcement play important roles in adaptation planning. The General Plan lays out the policy framework for addressing climate change. The community plans offer specific land use vision and goals for districts and neighborhoods that are generated by each individual community, which generates social engagement that can aid the response to the increasing risk of climate change.

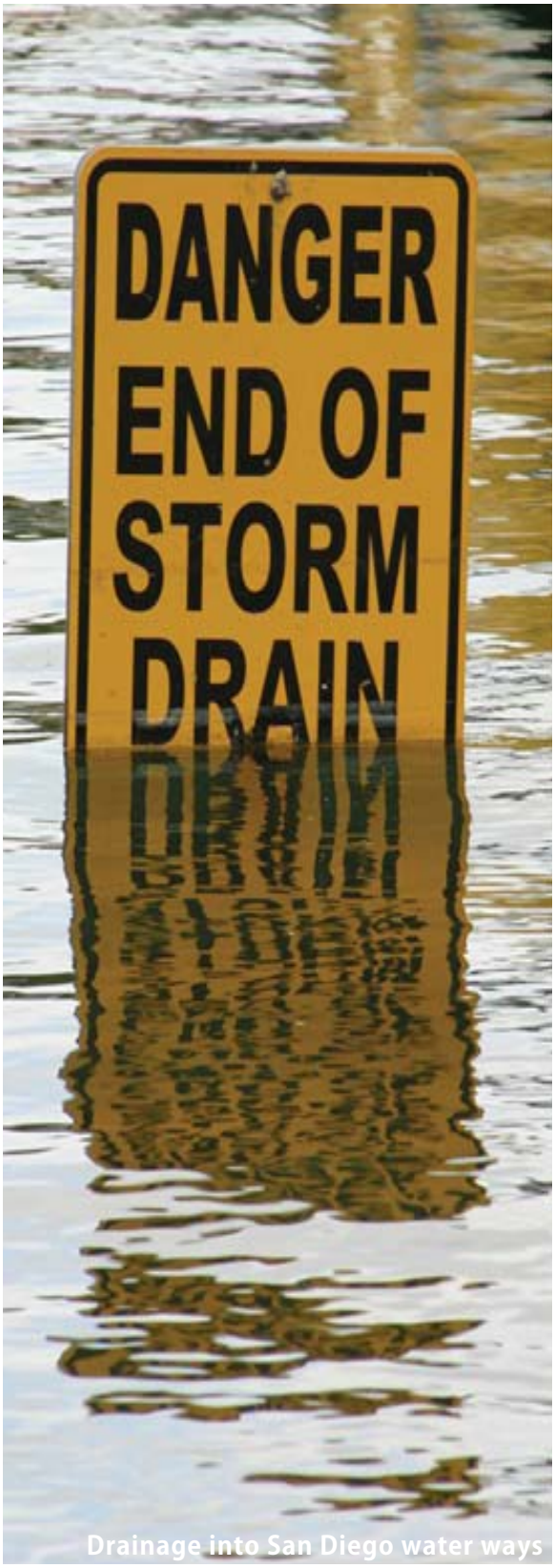
The purpose of building codes and inspection are to protect public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. The Climate Action Plan articulates the increased risks of climate change; the City of San Diego can define specific action in the form of local amendments to the statewide building code to increase building and occupant readiness.

Investing in action now saves lives and provides long term cost savings. As we increase building and occupant resiliency today, we will better able to meet the challenges of a changing climate tomorrow.

San Diego Beaches

Community Education, Knowledge and Collaboration

Building resilience in all of San Diego's diverse communities to projected local climate change impacts such as increasingly intense and frequent wildfires, heat waves and coastal flooding, will require broad engagement and involvement from within City government, with other governments and public agencies, as well as with a broad cross-section of private organizations and residents. The good news is, there are a number of collaborations already underway in the San Diego region to build regional resilience to local climate impacts, which the City can leverage and build on these to actively engage various stakeholders in this effort. In implementing this plan, the City will continue to leverage the expertise and networks of various nonprofits, businesses and resident groups in order to build wider understanding and preparedness for the changes our region is already experiencing today, and will see more of in coming decades.



Drainage into San Diego water ways

FUNDING SUPPORT

This program is partially funded by California utility customers under the auspices of the California Public Utilities Commission and through a Partnership between the City of San Diego and San Diego Gas & Electric®.

United States Department of Energy

Additionally, this material is based on work supported by the Department of Energy under Award Number DE-EE0000877.

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Farmers Market

CITY OF SAN DIEGO